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Tomas MAROZAS

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SATELLITE TARGETING UNDER *JUS IN BELLO*

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Scientific supervisor:
Prof. Dr. Justinas Žilinskas (Mykolas Romeris University, Social Sciences, Law, S 001).

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Tomas Marozas

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Mokslinis vadovas:
Prof. dr. Justinas Žilinskas (Mykolo Romerio universitetas, socialiniai mokslai, teisė, S 001).

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For my Sun Tauras,

For my Moon Laura,

For my Earth Danutė and Edmundas

For my comet Martynas

For all the brave sunflowers
and their lost seeds
in the fight for their blue sky

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ABBREVIATIONS

ASAT – anti-satellite
CDDH – 1974-1977 Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law applicable in Armed Conflicts
DEW – directed energy weapon
DMSP – Defense Meteorological Satellite Program
ESA – European Space Agency
GCI – Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field. Geneva, 12 August 1949
GCII – Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea. Geneva, 12 August 1949
GCIII – Convention (III) relative to the Treatment of Prisoners of War. Geneva, 12 August 1949
GCIV – Convention (IV) relative to the Protection of Civilian Persons in Time of War. Geneva, 12 August 1949
GEO – Geostationary Orbit
GNSS – Global Navigation Satellite Systems
GOES – Geostationary Operational Environmental Satellite
GPS – Global Positioning System
IACHR – Inter-American Commission on Human Rights
IAEA – International Atomic Energy Agency
IAP – Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977
ICBM – Intercontinental Ballistic Missile
IHRL – International Human Rights Law
ICRC – International Committee of the Red Cross
IHL – International Humanitarian Law
IIAP – Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977
ILA – International Law Association
IMINT – Imagery Intelligence
ISL – International Space Law
ISS – International Space Station
JDAM – Joint Direct Attack Munition
LEO – Low Earth Orbit
LOAC – Law of Armed Conflict
NOAA – National Oceanic and Atmospheric Administration
OECD – Organization for the Economic Co-operation and Development
PNT – Positioning, navigation and time

SIGINT – Signal Intelligence
UN – United Nations
UNCLOS – United Nations Convention on the Law of the Sea
UNEP – United Nations Environment Programme
UNGA – United Nations General Assembly
UNSC – United Nations Security Council
UTC – Coordinated Universal Time
WWII – World War II

KEY NOTIONS

Down-link – the link (signal) from a satellite down to one or more ground stations or receivers

Geneva law – a body of law that mainly deals with the protection of the victims of armed conflicts who are in the power of a party

Hague law – a body of law dealing with rules of conduct of hostilities and establishing limitations or prohibitions of specific means and methods of warfare

Jamming – a form of electronic ASAT attack that interferes with communications traveling to and from a satellite by emitting noise of the same radio frequency within the field of view of the satellite's antennas

Jus ad bellum – body of international law governing legality of the use of force

Jus in bello – body of international law governing the way in which warfare should be conducted

Kessler syndrome – a phenomenon proposed by NASA scientist Donald J. Kessler, according to which the likelihood of satellite collisions increases with the growing number of orbiting fragments until it becomes uncontrollable rendering space unusable

Outer space – the physical universe beyond the Earth's atmosphere

Spoofing – form of satellite signal interference which makes the receiver believe it is at a false location

Up-link – the link from a ground station up to a satellite

INTRODUCTION

Research problem. This thesis will not start with axiomatic reflections on how fast new technologies develop and how slow the law chases the former. Such a statement would not be entirely correct, at least in context of outer space. Some claim that outer space technologies have been developing too slowly. The former NASA astronauts lamented the United States lost ambition to concur outer space. Eugene Cernan, the last man to walk on the Moon, at the age of 75 said: "I really believed we'd be back to the Moon by the end of that decade and on our way to Mars by the end of the century... but my glass has been half-empty for the last three decades at least."[1] Indeed, if we took a glance at main sectors of space applications identified by Organization for the Economic Co-operation and Development (hereinafter – OECD), we would see major technologies applied in those sectors are not new, but rather essentially updated.[2] For instance, positioning, navigation and timing services (hereinafter – PNT) provided by Global Navigation Satellite System (hereinafter – GNSS) satellites which are commonly used by various present devices have been developed since 1970s.[3] The development of reusable rockets, such as Falcon 9 of the SpaceX, is yet another example of essentially modified albeit decades-long intercontinental ballistic missile (hereinafter – ICBM) technology.[4] These examples do not implicate in any way that the economy of space is static, it is rather not as rapid as was expected.

Although it may be questioned whether space technologies should have gone further by now, the unquestionable and undeniable truth about outer space is that it is being more and more congested. Compared to Cold War era space being an exclusive domain of the United States and the Soviet Union, the present actors include other major space-faring states, such as China, India, Iran, Israel, North Korea, Japan, United Kingdom, France and many other European Countries through consolidated platform of European Space Agency (hereinafter – ESA). Indeed, even relatively small countries having no space programs as Lithuania have their own satellites placed in orbit[5] or

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1 Jacqui Goddard, "Apollo astronauts lament America's lost ambition", New York Times, 2009, accessed, August 5, 2020, https://www.thetimes.co.uk/article/apollo-astronauts-lament-americas-lost-ambition-2q8h96fwx6p.

2 For example, such as satellite communications (voice, data, Internet, and multimedia), broadcasting (TV and radio services, video services, Internet content), positioning, navigation and timing services and other services. OECD, "OECD Handbook on Measuring the Space Economy, 2nd Edition," OECD iLibrary, 2022, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

3 NASA, "Global Positioning System History," NASA TV, 2012, https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html.

4 See "1. THE RELEVANCE OF SATELLITES"; SpaceX, "Falcon 9 - First Orbital Class Rocket Capable of Reflight," accessed August 18, 2022, https://www.spacex.com/vehicles/falcon-9/.

5 "Lithuanian Satellite Launched to Space from India," Delfi.lt, accessed August 18, 2022, https://www.delfi.lt/en/business/lithuanian-satellite-launched-to-space-from-india.d?id=75027666.

business entities manufacturing satellites.[6] Decentralization of space becomes more and more evident as space sector is no longer an exceptional domain of states. Private companies play an important role developing space launch capabilities – SpaceX, Virgin Galactic, Blue Origin, Boeing, Starchaser are only a few examples among other in this competitive sector. Throughout last decade alone, space sector has experienced structural changes – the lowered cost of access to space placed more emphasis on digital assets. Many space start-ups engage in both manufacturing and data exploitation.[7] The rising demand and declining cost for high-quality space-based services have increased both, the number of systems launched into space and the number of subjects participating in space economy.[8] The year of 2021 marked a record of 145 orbital launch attempts from 8 nations (compared to 84 launches in 2011), a record of the size of space industry reaching $ 423,8 billion (compared to $ 289,8 in 2011) a record of 1 730 payloads deployed in outer space (compared to 129 in 2011), even a record of 22 space tourists admiring the Earth from above (none of space tourists recorded in 2011).[9] From 1957 to 2022 (August), a total amount of objects launched into space is 13 451,[10] less than a third of it constitute operational satellites, almost 30 000 pieces of trackable debris (over 10 cm of size)[11] and estimated 170 million pieces of untrackable debris.[12] The plans of the upcoming decade fascinate and frighten at the same time – SpaceX alone plan to launch 42 000 satellites to fully form Starlink constellation.[13]

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6 See UAB NanoAvionics, homepage: https://nanoavionics.com/.

7 OECD, "OECD Handbook on Measuring the Space Economy, 2nd Edition," OECD iLibrary, 2022, 31, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

8 National Air and Space Intelligence Center, "Competing in Space," 2018, https://media.defense.gov/2019/Jan/16/2002080386/-1/-1/1/190115-F-NV711-0002.PDF.

9 Space Foundation, "2021 Annual Space Report" (Colorado Springs, 2021), 1, https://www.spacefoundation.org/wp-content/uploads/2022/04/SpaceFoundation_2021-Annual-Report_Final-1.pdf; Space Foundation, "Space Foundation's 2012 Report Reveals 12.2 Percent Global Space Industry Growth in 2011," https://www.spacefoundation.org/2012/04/05/space-foundations-2012-report-reveals-12-2-percent-global-space-industry-growth-in-2011/; Annual Number of Objects Launched into Space, Our World In Data, https://ourworldindata.org/grapher/yearly-number-of-objects-launched-into-outer-space?country=OWID_WRL~USA~RUS~CHN~GBR~JPN~FRA~IND~DEU~European+Space+Agency.

10 United Nations Office for Outer Space Affairs, "Online Index of Objects Launched into Outer Space", https://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id=#?c=%7B%22filters%22:%5B%5D,%22sortings%22:%5B%7B%22fieldName%22:%22object.launch.dateOfLaunch_s1%22,%22dir%22:%22desc%22%7D%5D,%22match%22:null%7D.

11 European Space Agency, "About Space Debris," accessed August 18, 2022, https://www.esa.int/Space_Safety/Space_Debris/About_space_debris.

12 European Space Agency, "How Many Space Debris Objects Are Currently in Orbit?," accessed August 18, 2022, https://www.esa.int/Space_Safety/Clean_Space/How_many_space_debris_objects_are_currently_in_orbit.

13 Michele Yan Huang and Dave Mosher, "What Elon Musk's 42,000 Starlink Satellites Could Do for — and to — Planet Earth," Business Insider, 2021, https://www.businessinsider.com/how-elon-musk-42000-starlink-satellites-earth-effects-stars-2020-10.

The growing number of objects placed into orbits raise both, environmental and security concerns. From environmental perspective, crowded with satellites orbits and post-launch space debris impede space accessibility. On the other hand, the growing number of governmental and non-governmental participants in outer space raise military concerns for major space superpowers. The recent United States Security Strategy calls the phenomenon of growing access to space a "democratization of space" and clearly indicates that it has negative impact on military operations of the United States and its ability to prevail in the conflict.[14] Satellite services make an essential component of contemporary military operations – from military intelligence to weather forecast, from communication to smart missile targeting. It would not be wrong to claim that the technological dominance in outer space determines (at least partly) military dominance on land. Consequentially, recent decades have been marked with numerous kinetic anti-satellite (hereinafter – ASAT) weapon tests which have been criticized extensively for space debris creation and their threat to other satellites. In 2007, China successfully tested a kinetic ASAT device which was launched from the Earth. By no means the first of such kinetic ground-to-space tests it hastened a new form of "space race" by the superpowers. Indeed, in 2008, USA successfully destroyed one of its military intelligence satellites, in 2019 – India, and most recently, in 2021 – Russia. Merely these four kinetic ASAT weapons tests have increased a total number of space debris as calculated from 1957 by 25 percent.[15] The rising number of space debris impedes access to space and peaceful exploration, pose threat to other space assets and threatens civilian commodities provided by satellites. As it is seen in further parts of this thesis, not only kinetic, but also non-kinetic weapons such as signal jamming technologies and directed energy weapons (hereinafter – DEWs, lasers) appear in the list of ASAT weapon tests. Not only they are tested, but in fact used to disturb peacetime military exercise activities of other countries, and even form an integral part of present ongoing armed conflicts. There is no doubt that the theoretical term "militarization of space"[16] has gained significant practical weight.

The law regulating conduct in hostilities, international humanitarian law (hereinafter – IHL), also known as the law of armed conflict (hereinafter – LOAC), or *jus in bello*[17], especially the part which regulates targeting process, has not been volatile either. Since the adoption of Protocol Additional to the Geneva Conventions of 12

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14 The White House, "National Security Strategy of the United States of America," 2017, 31, https://history.defense.gov/Portals/70/Documents/nss/NSS2017.pdf?ver=CnFwURrw09pJ0q5EogFpwg%3D%3D.

15 European Space Agency, "About Space Debris."

16 Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945-1984* (New York: Cornell University Press, 1985).

17 For the purpose of causing less confusion the Author uses IHL or *jus in bello* in context of identifying a branch of international law. However, LOAC being a term widely adopted in Commonwealth legal tradition, is used only when national military manuals restraining warfare conduct are discussed, since first ever manual as such appeared in the United States and other states, even those being part of continental legal tradition, pursued calling these legal guides mostly LOAC manuals rather than IHL manuals.

August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977 (hereinafter – IAP) and 1977 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977 (hereinafter – IIAP) no major changes or new codifications appeared (except for single weapon ban treaties). Naturally, some hypothetical implications can be made ahead: modern IHL being almost half century old, is not modern anymore and additional regulation in form of international treaties is needed to avoid legal gaps and traps. However, these claims would be meaningless without prudent analysis of the *lex lata,* weighting the need for additional regulation and difficulties of achieving it in a universal multilateral international instrument level. The process of the drafting Tallinn Manual on the International Law Applicable to Cyber Operations (hereinafter – Tallinn Manual)[18] serves as an example showing the strength of international law to adapt to new conduct through interpretation without additional regulation. Authors of Tallinn Manual contend that the hypothetical need for additional regulation may sometimes be satisfied by an "objective restatement of the *lex lata*."[19] Other examples of specific combat area LOAC manuals[20] show the tendency of this branch of international law to develop through interpretative techniques rather than new treaties often invoking additional fragmentation between other branches of international law.

In 2006, International Law Commission published a report on fragmentation of international law[21] where it emphasized a problem of specialized law-making and institution-building tending to take place with relative ignorance of legislative and institutional activities in the adjoining fields and of the general principle and practices of international law.[22] The IHL and international space law (hereinafter – ISL) have developed separately from one another and, consequently, have been enclosed with rules which are not only incompatible, but have a potential of conflict with one another in the context of space warfare. For instance, the backbone of ISL – Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer

18 Michael N. Schmitt, ed., *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017) (hereinafter - Tallinn Manual), 3.

19 Tallinn Manual.

20 San Remo Manual interpreting LOAC at sea, International Institute of Humanitarian Law, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, ed. Louise Doswald-Beck (Cambridge: Cambridge University Press, 1995) (hereinafter - San Remo Manual); Cambridge Manual interpreting LOAC in the air (Manual on International Law Applicable to Air and Missile Warfare (Program on Humanitarian Policy and Conflict Research at Harvard University, *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge, 2013).

21 Study Group of the International Law Commission, "Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law," 2006, (hereinafter - ILC Fragmentation Report), https://doi.org/10.18356/ed47d916-en.

22 ILC Fragmentation Report, 10.

Space, Including the Moon and Other Celestial Bodies (hereinafter – OST)[23] – requires ultimate protection of astronauts and treats them as "envoys of mankind" while IHL permits wilful killing of combatants who are primarily members of state armed forces. In case an astronaut is a member of armed forces, should he or she be protected in outer space during an armed conflict or lawfully targeted? If such an astronaut is captured, should he or she be returned to representatives of the launching authority as required by ISL, or, contrary, captured as a prisoner of war as required by IHL? Another example of conflicting laws being significant to the process of targeting is related to the duty to cooperate between states. On the one hand, ISL requires a state to undertake appropriate international consultations with another state which may potentially face harmful interference by activities of the former state. If we placed this duty in the context of armed conflict, it may appear that the law requires any satellite attack to be implemented only after consulting a state owning that satellite. No matter how ridiculous these extrapolating examples may sound, the fact is that ISL and IHL are distinct branches having contrary requirements in different contexts as a result of fragmentation of international law. That leads to identification of the first problem of this research – there is legal uncertainty about application of conflicting rules of IHL and ISL. In other words, in certain circumstances related to the military operations against satellites it is not evident what is the required conduct by international law. This uncertainty complicates any further research regarding IHL targeting requirements because it might be the case that they are inapplicable in case of contradiction to ISL. Therefore, the question of ISL and IHL conflict resolution, substantiating all further research about satellite targeting, forms the legal basis of this thesis.

Targeting rules apply to a specific form of military operations – attacks. Albeit this notion is defined by law,[24] it does not stipulate what form of violence constitute attacks. ASAT means include not only kinetic force weapons, but also non-kinetic, such as signal jamming or spoofing technologies. Therefore, some ASAT activities might be regulated by targeting rules – others not. States already possess and use non-kinetic ASAT weapons while the requirements of their use, especially application of targeting rules, are still unclear.

Targeting process requires prudent identification of a target. The current ISL legal framework requires each launching state to register objects launched into space and, among other requirements, indicate their general function.[25] Naturally, this requirement does not explicitly impose any obligation on states to identify their launched objects as either military objectives or civilian objects. It is hardly imaginable that any state would ever ratify a treaty requiring the disclosure of its military secrets or otherwise essentially undermining its security. IHL imposes duty to identify a potential

23 Treaty on principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies, Oct. 10, 1967, 610 U.N.T.S. 205 (hereinafter – OST).

24 1977 IAP, art. 49(1).

25 Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 1023 U.N.T.S. 15, Art. 4.

target only upon the attacking party. And only those targets which constitute military objectives are allowed to be targeted.[26] Identification of a satellite as a military objective is complicated due to satellite remoteness from Earth and the extreme environment of outer space. What complicates this process more, is that satellites sometimes simultaneously serve either military, either civilian or both devices. In one case a signal from a specific satellite may reach a receiver build in the military equipment, in another case – a civilian device, while in a third case – both devices in the down-link proximity of a satellite. This begs the answer to the question whether the status of a satellite depends from its signal recipient and what would be the status of dual-use satellites (used for military and civilian purposes at the same time). When and how exactly a satellite becomes targetable, or in other words, legally qualifies for military objective, is yet another legal issue that has not been solved.

Not only the status of satellites is uncertain but also the status of outer space itself. One of peculiarities of IHL is that besides general dichotomic classification of all objects into military objectives and civilian objects (granting protection only to the latter), it has specific rules armouring certain objects with *sui generis* protection. For instance, IHL identifies the need to protect natural environment from hazards of war and prohibits attacking it under certain conditions.[27] Kinetic satellite attacks raise concerns about the amount of space debris generated by a collision between kinetic kill vehicle and a satellite. In this context, it may be questioned whether outer space constitutes natural environment in sense of IHL and, secondly, whether space debris constitutes damage to it as prohibited by specific rules of IAP. That leads to the third issue related to undefined IHL notion of the natural environment.

The process of targeting does not end with identification of a target. Many other estimations need to be made prior launching an attack. This includes taking certain precautionary measures to reduce collateral damage, including estimation and comparison of collateral damage with the military gain. This process, called proportionality assessment, is highly complicated, requiring comparison of incomparable values and outer space environment with satellite technology make it even more difficult. This is because the loss of a satellite signal may cause unpredictable consequences. The attack on a satellite could not only cause malfunction of a satellite itself, but also the malfunction of devices on Earth which eventually could end with civilian casualties or even deaths. The jammed signal of a satellite belonging to GNSS could not only mislead smart missiles, but also cause civilian aircrafts missing runways, crashing self-driving cars, loss of heating in winter, crashed stock exchanges, inoperative ATMs, floods from suddenly opened automated dams, overcrowded hospitals and much more. The case of SVN-23 error[28] showed that these worst scenarios are not merely theoretical. From

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26 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), Jun. 8, 1977, 1125 U.N.T.S. 3 (hereinafter – 1977 IAP), art. 52(2).

27 1977 IAP, arts. 35(2) and 55.

28 Discussed in "3.8.4.2. Assessment of Collateral damage".

the legal point of view, the inability to predict collateral effects of the potential satellite attack complicates application of principle of proportionality as one essential part of it – estimation of potential collateral damage – is lacking. Bearing in mind the fact that IHL does not condition any derivation from this customary principle, its effectiveness may be questioned. On the one hand, the law may not require to do what is impossible,[29] on the other, the law provides no exceptions to this rule. More to add, IHL does not explicitly define the collateral damage and, accordingly, to what extent the reverberating effects of the attack might stretch in the proportionality assessment process. Should the attacking party take into consideration only direct collateral effects of the attack, such as the loss of satellite signal, or should it include more causal steps, such as the likelihood of civilian casualties as a result of the lost signal? These ambiguities lead to the fourth problem – the obscure scope of law in regards to preparatory measures of satellite attacks.

Principle of distinction is one of the core principles of IHL. Generally, it requires parties to the conflict distinct from civilians and wage attacks only against military objectives. Besides its direct meaning, this principle has many derivatives, one of which is the prohibition of indiscriminate attacks.[30] The use of means and methods of warfare which have uncontrollable effects and consequently strike civilian objects and military objectives without distinction is an example of indiscriminate attack. Taking into consideration kinetic satellite attacks causing multiple pieces of space debris floating in orbits in uncontrollable ways and threatening other space assets, the question may be raised whether these attacks are indiscriminate and prohibitive *per se.* On the other hand, the rule prohibiting indiscriminate attacks does not indicate whether only direct effects of the used mean need to be considered. For instance, it might be said as well that a kinetic ASAT weapon targeting a satellite does have controllable effects – its kinetic kill vehicle uses sensors to reach the target and strike with ultimate precision. Therefore, the primary effect of the weapon – capability to strike with precision – does not violate requirements for target discrimination. This being said, another question related to the principle of distinction and its application may be raised – do ASAT activities comply with IHL's requirement to discriminate targets?

Although IHL is mostly applicable only during armed conflicts, some notions are designed to be applied in peace-time as well. One of such examples is the requirement for the states to make legal reviews of weapons which they study, develop, acquire, or adopt. In other words, any state willing to "modernise" military equipment should not only study technical parameters of a weapon but also make legal considerations whether the use of a new weapon during an armed conflict would be in line with IHL.[31]

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29 Emanual Kant argued that the Latin maxim *ultra posse nemo obligatur* (no one may be obliged to do what is impossible) is the general norm for free actions. Gottfried Achenwall, *Natural Law: A Translation of the Textbook for Kant's Lectures on Legal and Political Philosophy*, ed. Pauline Kleingeld (London: Bloomsbery Publishing Plc, 2020).8

30 1977 IAP, art. 51(4).

31 1977 IAP, art. 36.

It should be borne in mind that there is no mechanism under international law requiring accountability or revision of conducting legal reviews of weapons, therefore, it is impossible to check whether this duty is in fact obeyed. Supposedly states follow it and make a review of a new weapon, supposedly a person drafting a review is objective, uninfluenced by politicians or military superiors and concludes that the developed weapon, if used under circumstances of the armed conflict, would contradict state's international obligations. What measures should the state then take? Should it stop weapon development, change weapon characteristics to comply with the law, or may it pursue developing new weapon as planned? IAP does not provide any answers to these questions and this makes the last issue to be solved by this thesis – disclosure of obligations relative to legal weapon reviews and in this context, assessment of peacetime kinetic ASAT tests. Having in mind the negative space debris outcome of kinetic ASAT tests and considerations of banning such practice,[32] the analysis of this topic could either stimulate further ban discussions or be a source for lawyers conducting legal reviews the least.

The relevance of the problem. As outer space becomes more and more congested and militarized,[33] identification of legal boundaries of such conduct is of crucial importance at global level. In 2020, United Nations (hereinafter – UN) General Assembly (hereinafter – UNGA) passed a resolution urging Member States to study existing and potential threats to space systems and "<…> share their ideas on the further development and implementation of norms, rules and principles of responsible behaviors and on the reduction of the risks of misunderstanding and miscalculations with respect to outer space."[34] Most of the states unanimously identified ASAT technologies deviating space security. Even China – the author of most notorious kinetic ASAT test to date – admitted that space weaponization prevention is fundamental for maintaining space security.[35] The global concern of current space security situation makes this thesis not only generally relevant, but also research results potentially practically significant.

The modern laws of war have been in force since 1977. These laws have been primarily written for land, sea and (in small part) air warfare. None of them directly connote to outer space. As it has been already indicated, many rules of IHL are broadly

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32 Daryl G. Kimball, "U.S. Commits to ASAT Ban," Arms Control, 2022, https://www.armscontrol.org/act/2022-05/news/us-commits-asat-ban; Jeff Foust, "Canada Joins U.S. in ASAT Testing Ban," Space News, 2022, https://spacenews.com/canada-joins-u-s-in-asat-testing-ban/; Spacewatch, "Russia's Roscosmos To Initiate Talks On Kinetic Kill ASAT Ban," Spacewatch Global, 2019, https://spacewatch.global/2019/12/russias-roscosmos-to-initiate-talks-on-kinetic-kill-asat-ban/; Talia M. Blatt, "Anti-Satellite Weapons and the Emerging Space Arms Race," Harvard International Review, 2020, https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/.

33 See Joan Johnson-Freese, *Space warfare in the 21st century : arming the heavens* (New York: Routledge, 2017), 26-55.

34 GA Res 75(36), UNGAOR, UN Doc A/RES/75/36 (2020), 3/3, para. 5.

35 Document of the People's Republic of China pursuant to UNGA Resolution 75/36 (2020), https://front.un-arm.org/wp-content/uploads/2021/05/Chinas-Position-on-Outer-Space-SecurityEnglish.pdf.

formulated and thus leave their application uncertain. However, this is not necessarily a drawback. The general nature of IHL rules paves a convenient way for interpretation of the law. IHL might be capable to adapt to technological innovations used by militaries and there might be no need to propose additional regulation. The answer to this question, if found, could give a push to further development of IHL.

The relevance of outer space for global services, the military significance of satellites and evolving state practice in satellite targeting makes the topic highly relevant, especially knowing the fact that there are no scripted rules of satellite targeting, as well as authoritative studies commenting it. The problems raised in previous field only show ambiguities and uncertainty in law regarding military conduct in outer space. These ambiguities have relatively rarely been discussed, not to mention the lack of answers or suggestions.

Satellites floating silently and peacefully in outer space often sustain loud and destructive activities on Earth. They are attractive targets because their trajectories are calculable, they have least chances to escape missile blasts which generate extreme amounts of kinetic energy due to high velocities in space. While the law of satellite targeting is discussive and not comprehensively explained, satellite targeting may seem unlimited. That perception may lead to devastating effects of satellite signal loss resulting in realization of Kessler's syndrome[36] in outer space and destruction, injuries and deaths on Earth. This is another reason showing a high demand of IHL interpretation in outer space field. Although debates on certain aspects provided in Tallinn Manual are still ongoing (the Author shares some criticism in this thesis), Author shares the view that the research made by the international expert group in drafting Tallinn Manual is a success story providing comprehensive interpretation of LOAC in cyber field. In field of military use of space, at least two expert groups are currently drafting (finalizing) manuals. One project examines international law applicable to military uses of outer space (called the Milamos project or McGill manual),[37] while the other concerns international law applicable to military space activities and operations (called The Woomera Manual).[38] Put it more simply, McGill manual covers a variety of international law subject matters applicable for peacetime events (including tensions that pose challenges to peace), while Woomera Manual focuses on international law applicable to armed conflicts and military space operations. Only McGill Manual has been published and only its first part listing rules (without commentary).[39] These initiatives surrounded by major experts in the field

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36 See Mike Wall, "Kessler Syndrome and the Space Debris Problem," Space.com2, 2021, https://www.space.com/kessler-syndrome-space-debris.

37 McGill University, "The McGill Manual on International Law Applicable to Military Uses of Outer Space," accessed August 18, 2022, https://www.mcgill.ca/milamos/.

38 The University of Adelaide, "The Woomera Manual," accessed August 18, 2022, https://law.adelaide.edu.au/woomera/.

39 Bearing in mind the object of this thesis, only Woomera Manual is relevant, because McGill manual does not directly solve questions of *jus in bello*, especially those related to satellite targeting.

show how great the demand for the legal explication of military space activities is. The experts drafting McGill Manual portray their mission of *lex lata* interpretation as a way "to ensure that outer space remains free from conflict and is explored and used in a safe, secure and sustainable manner, in accordance with the international rules-based order."[40] Indeed, the vision of McGill Manual authors' to ever prevent armed conflict in space is scenic and idealistic. However, we should not take the wishful peaceful use of outer space for granted – state practice has gone the other way long ago and could hardly ever demilitarize, renounce precision missiles, intelligence, or encrypted communication. These reasons show that the topic of satellite targeting is currently relevant and will stay so in the future.

Review of the relevant sources. The topic of space warfare is neither new nor outdated. It is complex, interdisciplinary, requiring not only legal knowledge but also general understanding of physics, satellite engineering and politics. Therefore, multiple sources from other than international law disciplines have been used extensively. The notable books on space warfare policy include those written by John J. Klein,[41] Joan Johnson-Freese,[42] David Pahl,[43] M. N. Sirohi.[44] ASAT engineering and weapon technology are important topics without which certain legal conclusions may not be drawn. Joseph A. Jr. Angelo astonishingly clrearly provided essential characteristics of space weapons,[45] Pat Norris explained the operations of space intelligence,[46] Jacob G. Oakley appraised the relevance of cyber attacks to space military operations.[47] These are only a few non-legal books which significantly helped exploring reality surrounded by outer space. Unfortunatelly, same may not be said about books analysing space warfare through the spectrum of international law. The Author found no specifically dedicated international law books about military space operations. Major reasearch is found in relatively short chapters of publications discussing general impact of new technologies to IHL or specifically addresses issues in periodical journals. Authors were relatively active in analysing IHL's applicability in outer space. Kubo Mačak provided a fruitful analysis on this topic confuting the doubts of sceptics and identified

40 Ram S. Jakhu & Steven Freeland, eds, McGill Manual on International Law Applicable to Military Uses of Outer Space: Volume I - Rules (Montreal: Centre for Research in Air and Space Law, 2022), 1.

41 John J. Klein, *Space Warfare: Strategy, Principles and Policy* (New York: Routledge, 2006).

42 Joan Johnson-Freese, *Space Warfare in the 21st Century: Arming the Heavens* (New York: Routledge, 2017).

43 David Pahl, *Space Warfare and Strategic Defense* (London: Bison Books, 1987).

44 M. N. Sirohi, *Military Space Force and Modern Defense* (New Delhi: Alpha Editions, 2016).

45 Joseph A. Jr. Angelo, *Frontiers in Space: Satellites* (New York: Infobase Publishing, 2006);

46 Pat Norris, *Spies in the Sky: Surveillance Satellites in War and Peace*, *Strategic Analysis*, 1983.

47 Jacob G. Oakley, *Cybersecurity for Space: Protecting the Final Frontier* (Owens Cross Roads: Apress, 2020).

major rules of IHL and ISL which are in tention.[48] Franz von der Dunk[49] and Dale Stephens[50] proposed ISL and IHL conflict resolution models. William H. Boothby, analysed the topic of satellite targeting in few chapters of his books and identified major issues related to application of IHL.[51] Melissa de Zwart who was one of the authors of William H. Boothby's edited book, presented the issues related to applicability of rules to military conflict in outer space, focused on *jus ad bellum* regulation.[52] Duncan Blake whom the Author had the chance to interview in person, is also one of the most visible legal commentators in the field. His research is related with military strategic use of outer space[53] and the law applicable to military strategic use of outer space.[54] Although relatively briefly, he also general *jus in bello* issues related to military activities in outer space. Jackson Maogoto analysed the topic in field of *jus ad bellum*.[55] Bill Boothby presented analysis from space weapons perspective and focused reasarch on mostly two principles of targeting – indiscriminate attacks and superfluous injuries. Bill Boothby was one of the few to analyse the quesiton of ASAT weapon reviews (along with Kubo Mačak).[56] Michael N. Schmitt systemically, although relatively briefly, contemplated on general IHL issues in outer space, such as when would satellites constitute military objectives, which ASAT activities constitute attacks and what legal implications flow from customary IHL principles.[57] Already mentioned Dale Stephens with co-author Cassandra Steer in their article elaborated questions of dual-use satellites and did emphasize important unsolved issues, such as reverberating effects of satellite attacks. Koplow analyzed ASAT activities through the spectrum of customary international

48 Kubo Macak, "Silent War: Applicability of the Jus in Bello to Military Space Operations," *International Law Studies* 94 (2018): 39.

49 Frans G. von der Dunk, "Armed Conflicts in Outer Space: Which Law Applies?," *International Law Studies* 97 (2021): 188–231.

50 Dale Stephens, "International Legal Implications of Military Space Operations", 94 *International Law Studies* 75 (2018),

51 William H. Boothby, *The Law of Targeting* (Oxford: Oxford University Press, 2012), 359-377; William H. Boothby, *New Technologies and the Law in War and Peace* (New York: Cambridge University Press, 2019).

52 Melissa de Zwart, "Outer Space", in *New Technologies and the Law in War and Peace*, ed. William H. Boothby (Cambridge: Cambridge University Press, 2019): 337-358.

53 Duncan Blake, "Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 97–114.

54 Duncan Blake, "The Law Applicable to Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 115–140.

55 Jackson Nyamuya Maogoto, *Technology and the Law on the Use of Force : New Security Challenges in the Twenty First Century* (New York: Routledge, n.d.), 31-53

56 Bill Boothby, "Space Weapons and the Law," *International Law Studies* 93 (2017): 179–214.

57 Michael Schmitt, "International Law and Military Operations in Space," *Max Planck Yearbook of United Nations Law* 10 (2006): 89–125, https://doi.org/10.1163/138946306783559959.

law.[58] Robert A. Ramey deserves exclusive mentioning. In 2000, he wrote one the first, most detailed and comprehensive articles in the field discussing types of ASAT weapons and IHL's application to outer space. He was one of the first to address the issue ISL and IHL relationship and identify specific conflicting rules. His work has been extensively quoted by other publicists.[59] Many other known experts of LOAC, to name only a few – Leslie C. Green,[60] Yoram Dinstein,[61] Gary D. Solis,[62] have influenced this work. No related research has ever been made by Lithuanian scholars.

Important remarks need to be given about normative sources as well. The major source of *lex lata* identification is IAP which accumulated and updated relevant provisions of the 1899 and 1907 Hague treaties known to be primary sources of law regulating means and methods of warfare. Despite multiple other sources regulating means and methods of warfare, IAP is used as a primary source of targeting rules because:

1. It was the first document to codify or crystalize certain important targeting rules, such as principle of proportionality;
2. Despite many adopted treaties in the turn of the nineteenth and twentieth centuries (such as 1899 and 1907 Hague Conventions) none of them were so widely ratified as the IAP. It still stands as the most detailed codification of the targeting rules;
3. Hague conventions of 1899 and 1907 share relatively general terminology compared to detailed provisions of IAP;
4. 1899 and 1907 Hague conventions are narrower, addressing only few important targeting rules compared to IAP;
5. During the 1974 CDDH on the adoption of IAP, OST and other important sources of ISL were already in force giving practical ground to discuss space warfare. 1899 and 1907 Hague treaties were drafted long before the beginning of space age and rudiments of space warfare;
6. Many targeting rules have been acclaimed to attain customary status only after Nuremberg trials. Therefore, the analysis of the Hague treaties would be geographically limited, as only minor number of States were parties to those instruments. This would lead to less practical research results.

Concerning customary IHL, this thesis does not aim neither to search and identify customary IHL, nor question it. As state practice is emerging in field of space warfare,

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58 David Koplow, "ASAT-Isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons," *Michigan Journal of International Law* 30 (2008): 1187; Boothby, "Space Weapons and the Law."

59 Robert A. Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space," *The Air Force Law Review* 48, no. 1 (2000): 157.

60 Leslie C. Green, *The Contemporary Law of Armed Conflict*, 2nd Ed. (Manchester: Manchester University Press, 2000).

61 Yoram Dinstein and Arne Willy Dahl, *Oslo Manual on Select Topics of the Law of Armed Conflict. Rules and Commentary* (Tel Aviv: Springer Open, 2020).

62 Gary D. Solis, *The Law of Armed Conflict. International Humanitarian Law in War* (Cambridge: Cambridge University Press, 2010).

in most instances, we can hardly claim the customary status of a certain rule. The most detailed to date study on customary IHL has been made by ICRC (hereinafter – ICRC Customary IHL study)[63] and rules identified in that study as customary are presumed to be so. Additionally, the work of David Koplow having analyzed the question of customary law in context of ASAT activities is used were necessary.

It should also be argued why sources regulating hostilities of not of international character are less relevant in context of the object of this thesis. IHL regulates two types of armed conflicts – international armed conflicts fought (mostly) by states and non-international armed conflicts where at least one party to the conflict is an organized non-state armed group. Because of state's willingness to have their own national legal tools to curb criminal-like, revolutionary or otherwise disobedient paramilitary movements within their territory, the scripted international law in this field remained relatively narrow. Moreover, the threshold of IHL's application for non-international armed conflicts (discussed shortly in "1.4. The threshold of non-international armed conflict") is much higher than the one applied for international armed conflicts. That leaves non-international armed conflict in space less possible and less relevant, even though non-state actors already take active part in space activities. Lastly, even though the scope of written IHL for non-international and international armed conflicts differ, it is generally claimed that major targeting rules (military necessity, precautions in attacks, proportionality, distinction, prohibition of indiscriminate attacks) have attained customary status and are equally applied in non-international armed conflicts.[64] Therefore, the rapprochement of both IHL's regimes would not add much of scientific value, make the analysis less relevant and even more repetitive. Despite this, essential characteristics, and differences between international and non-international armed conflict IHL regimes are explained for the purposes of a more comprehensive and understandable analysis.

Novelty of the research. Despite the great work of many notable authors mentioned previously, the Author lacked deeper approach on many questions surrounding current state practice related to ASAT activities. To begin with, current research aiming to solve ISL and IHL potential normative conflicts does not propose tactically practical solutions for targeting decision makers. On the one hand, in Author's view, scholars who researched that problem did not identify all potential normative conflicts, but rather focused on most evident ones (such as astronaut-combatant status conflict). Without seeing a full picture of potential normative conflicts, it is rather hard check whether a proposed conflict resolution mechanism fits all scenarios. Moreover,

63 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.* (Cambridge: Cambridge University Press, 2005) and Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary Interantional Humanitarian Law. Volume II: Practice* (Cambridge: Cambridge University Press, 2005).

64 The ICRC Customary IHL study indicates that most rules are applied to non-international armed conflicts.

although scrupulously constructed, thoughtful and reasonable, some of the proposed models have space for interpretation and can hardly be applied at operational level where strict and objective knowledge of *lex lata* is preferred to obscure and interpretative notions. The Author identifies all visible normative tensions between ISL and IHL and proposes a resolution mechanism which can easily be applied in practice at any operational level. The model is novel and it makes thesis practically significant.

A rather intense scientific debate takes place between military and humanitarian protagonists on the legal treatment of soft-military means and whether they constitute attacks. Indeed, this question has gone into arena of scientific journals in the form of "reply to critics" and still has not been agreed on. The Author proposes a novel look at the notion of "attacks" under IHL and how it should apply to non-kinetic ASAT activities.

Although the status of dual-use satellites has been periodically contemplated, most authors suggested to treat those satellites as military objectives by their military "use". However, this topic is not as narrow as it seems. For instance, it is questionable whether a satellite once used by the military retains the status of military objective indefinitely, or whether a specific part of a satellite making it a military objective (e.g. infrared sensor) can make the whole satellite military objective, or whether an alternatively used satellite constitutes a military objective. Many topics the Author discuss have not been publicly discussed elsewhere – the status of alternatively or simultaneously used satellites, status of unknown-purpose satellites, status of satellite parts, status of outer space, including the status of orbits are only few examples.

The causal stretch of reverberating effects of satellite attacks, especially kinetic ones, is yet another difficult question showing novelty of this thesis. Authors emphasized the need to apply principle of proportionality in regards to attacks, however, none of them contemplated how exactly should the collateral damage of satellite attacks be measured and how far reverberating effects of attacks should be predicted in proportionality assessment.

A novel approach on legal weapon review duty is provided as well. Despite the rather broad formulation of this duty requiring the states to only make legal reviews of new weapons, the Author raises a novel question whether this duty extends to peacetime weapon testing and whether kinetic ASAT weapon testing is in line with it.

What also makes this research novel, is that the analysis of satellite targeting – a relatively narrow topic – is provided in one comprehensive piece of research combing views of publicists, state practice and relative jurisprudence of international courts.

Practical significance of the research. The Author shares the view that persuasive treaty interpretation may complement the absence of international binding rules and even influence decision makers who form state practice which eventually may one day root into an internationally binding custom. The results of dissertation may serve in the following ways:

1. Military lawyers, legal advisors and other officials may use research results when giving advice to targeting decision makers or drafting legal weapon reviews;

2. The results of dissertation may be a source for drafting national LOAC manuals or updating them;
3. The results of dissertation may give impetus for discussion among lawyers of international law, including those drafting Woomera manual;
4. The results of dissertation may be in use for teachers of IHL drafting study programmes and making practical tasks for students.

The object of the thesis. Application of IHL targeting rules to ASAT activities.

The purpose and the objectives of the thesis. The purpose of this thesis is to analyse how *jus in bello* targeting rules apply to ASAT activities, identify legal issues that float from ASAT activities and propose their solution mechanisms. For that purpose, the thesis sets the following objectives:

1. Define the interplay between IHL and ISL and propose a resolution mechanism for potential normative conflicts;
2. Explain when satellites legally qualify for military objectives;
3. Analyse the status of outer space under IHL and what legal implications flow from it;
4. Examine whether kinetic ASAT attacks constitute indiscriminate attacks;
5. Scrutinize how the principle of proportionality applies to ASAT activities and to what extent reverberating effects of satellite attacks constitute collateral damage;
6. Analyse whether the duty to review new ASAT weapons legally restricts kinetic ASAT tests in peacetime.

The hypothesis of the thesis. *Lex lata* of IHL is sufficient to regulate satellite targeting.

The methodology. The topic appertains to the relative field of social sciences, therefore the characteristic methods to this branch of science used in thesis are the following: analogy, comparative analysis, document analysis, historical, linguistic, and systemic analysis.

Analogy. IHL rules have often been portrayed as *lex specialis* in relation to other branches of public international law, namely, international human rights law (hereinafter – IHRL). The debate and arguments used by courts and publicists on IHL and IHRL relationship serve as the basis for the search of IHL and ISL interplay. The Author seeks to transpose criticism expressed in IHL and IHRL relationship debate and check if *lex specialis* normative resolution technique can still be applicable in case of IHL and ISL potential conflicts.

Comparative analysis method serves as a tool to evaluate different positions of publicists and *opinio juris* of states. For instance, an ongoing debate about the definition of attack sparked in the Tallinn Manual provoked many debates not only among researchers, but even organizations. The arguments used by them are compared and placed into the context of space warfare. In another way, this method helps to identify

opinio juris when analyzing national military manuals and comparing views of states, such as how states treat dual-use objects and how they portray collateral damage in the assessment of attack proportionality.

Document analysis is applied in various contexts throughout thesis, from evolution of ASAT weapons to the genesis of customary targeting principles. This method is useful to construct arguments explaining the meaning of certain rules. For instance, *travaux préparatoires* of the 1974-1977 Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law applicable in Armed Conflicts (hereinafter – CDDH) is used to disclose the intent of drafters and explain the meaning and scope of relevant IAP rules, such as duty to review new weapons or IAP applicability in the environment of outer space.

Teleological method. The official records of the CDDH are in hand to disclose the intent of the drafters and explain the meaning and purpose of specific rules. For instance, while analyzing the question of IHL's applicability in different environments, the Author searched whether delegations who participated in CDDH had views or made comments on outer space as a potential field of future combat and whether rules of IAP are subjected to this form of warfare. Moreover, this method helped to disclose the rather general formulation of IAP Article 36 requiring the states to conduct legal weapon reviews.

Linguistic method is used to explain the common understanding of terms otherwise not described in specific rules, including those drafted by national legislators. For instance, the analysis of United States position on the definition of military objective, more specifically, the difference between legal notions of "destruction" and "neutralization", required the search of their meaning in official military dictionaries. In another context, linguistic method was used to contemplate on the question whether outer space can be considered as natural environment under *jus in bello* regime. Moreover, this method helped to disclose the meaning of "expected collateral damage" or which activities should be considered as "indiscriminate".

Systemic analysis is one of the major methods use in this thesis. ASAT activities are not specifically regulated by scripted sources of IHL. This gap invokes many legal issues related to current actual conduct and hypothetical conduct expected to happen in the future. Major chapters include analysis of legal texts, jurisprudence, *opinio juris*, state practice and opinions of publicists. These sources of international law often appear to contradict each other making conclusions relatively hard to be instantly drawn. A systemic analysis approach helps to identify a connecting theme of these differences and provide reasonable conclusions. As an example, while searching for IHL and ISL potential normative conflict resolution mechanisms, the Author had not only to analyse and opt most relative conflict resolution mechanisms, but also analyse how these methods have been applied in jurisprudence, how their application changed, what were the reasons for it, how it was portrayed by publicists and what arguments they made and whether those arguments stand in context of IHL and ISL interplay. In other case, being one of the core principles of IHL, military necessity is not defined by law, although in few instances mentioned. If only legal texts were taken as a source to disclose the meaning of this principle, it would be most probably misunderstood

as being an exception from a specific rule. Therefore, in order to understand this and other IHL targeting principles, it is necessary to analyse their origins, *opinio juris*, opinions of scholars and how in practice they are applied by international courts. And only after disclosure of their meaning, they might be brought to the context of ASAT activities. Therefore, the disclosure of the meaning of most legal terms contemplated in this thesis require systemic approach as it is often the case that the meaning of a legal notion is not fully disclosed in one legal source.

Historical method. As already indicated, the use of this method helped to disclose the meaning of IHL targeting principles, most of which changed throughout adoption of new legal instruments. For instance, historical analysis method allowed to disclose the fact that principle of distinction evolved as a principle protecting persons, not objects, and only after 1977 with the adoption of IAP, objects without military value attained the protective status of civilian object.

Structure of the thesis. The topic is divided into four segments constituting separate chapters.

The first chapter analyses IHL's applicability in outer space and the interplay between IHL and ISL. This analysis is necessary as some rules of ISL have a potential of conflict with IHL's rules and *vice versa*. Without such analysis, many further contemplated legal issues would only be hypothetical, lacking practical significance.

The second chapter seeks to disclose the circumstances under which a satellite is treated either as military objective or civilian object, as well as the status of outer space which could have effect on the status of satellite. This chapter is called targetability of satellites seeking to emphasize the initial targeting stage – target identification – and distinguish it from targeting principles.

The third chapter scrutinizes general principles of targeting: military necessity, precautions, distinction, unnecessary suffering and proportionality. These topics are presented not only from current legal perspective, but also historical for the purpose of understanding and applying these principles correctly.

The fourth chapter analyses obligation of states to review new ASAT weapons and how it restricts states' peacetime preparatory ASAT conduct.

1. APPLICABILITY OF INTERNATIONAL HUMANITARIAN LAW IN OUTER SPACE

1.1. Overview

Satellite technologies are as old as World War II (hereinafter – WWII). Intercontinental ballistic missile (hereinafter – ICBM) technologies have been developed by Nazi Germany and, in the aftermath of the WWII, German scientists aided the United States and the Soviet Union in development of satellite launch technologies.[65] If we took into consideration the fact that satellite technology development was conditioned firstly by the development of ICBM technologies, we could state that satellite technologies are even older than the space age itself. Indeed, in 1957, Sputnik 1 was launched into outer space by an ICBM. Decades later same technology is still in use and is considered to further be used by famous SpaceX founder Elon Musk for his planned Mars project.[66] By the time of drafting Protocol Additional to the Geneva Conventions of 12 August 1949 and relating to the Protection of Victims of International Armed Conflicts (hereinafter – 1977 IAP), it has already been more than 10 years after the first military satellites (SCORE and DISCOVERER/CORONA) were successfully placed in Low Earth Orbit (hereinafter – LEO)[67] and the OST with major restrictive space militarization notions was already in force. 1977 IAP drafters were well aware of the fact that outer space is and will increasingly be militarized. Actually, Poland delegation (by the time satellite state under control of USSR) proposed inclusion of outer space into the article of 1977 IAP dealing with 1977 IAP's field of application.[68] The Working Group drafting the text of the 1977 IAP was asked by Mexican delegation whether it considered the effects of hostilities taking place in outer space at the time of drafting 1977 IAP. The Rapporteur of the Working Group answered negatively.[69] Outer space as a military domain evidently attainted attention during the drafting process of 1977 IAP, despite this, it was left out the normative scope of 1977 IAP. Considering the

65 U.S. Department of State, "The Launch of Sputnik, 1957," accessed September 29, 2021, https://2001-2009.state.gov/r/pa/ho/time/lw/103729.htm; Robert Perry, *A History of Satellite Reconnaissance*, 1973, https://www.nro.gov/Portals/65/documents/foia/docs/hosr/hosr-vol1.pdf.

66 Melissa de Zwart, "Outer Space", in *New Technologies and the Law in War and Peace*, ed. William H. Boothby (Cambridge: Cambridge University Press, 2019): 348.

67 National Aeronautics and Space Administration, "SCORE," NASA Space Science Data Coordinated Archive, accessed September 29, 2021, https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=1958-006A.

68 Federal Political Department, "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts," vol. XI, 1978, 59.

69 Federal Political Department, "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts," vol. XIV (Bern, 1978), 86.

internet's globalization and instrumentalization of cyber warfare in 1990s[70], it is seemingly strange that the Tallinn Manual showed up first than Woomera or Milamos manuals (discussed in the INTRODUCTION), since outer space technologies, including military, are far older than the World Wide Web.[71] In this case the Author could stress that by the time of writing this thesis many issues and ambiguities that are discussed in further chapters should have been cleared long ago.

One of such ambiguities is that there is no common agreement on whether and how IHL applies to military space operations. It has varied reasoning.

Firstly, the major treaties governing conduct of hostilities[72] were drafted specifically to regulate wars on land and sea, none of them mention outer space. It could be said therefore, that drafters of these documents have never intended them to be expendably applied, since they specifically indicated theatres of war where rules meant to be applied. For this reason, this Chapter focuses on general IHL application techniques and seeks to answer the question whether IHL's application is limited geographically and whether outer space can qualify for the theatre of war.

Secondly, the major precondition of IHL's application is the existence of an armed conflict. Which military activities constitute armed conflict is a question of discussion, especially bearing in mind the fact that it is not universally agreed upon whether single acts of hostilities, such as border incidents, reach the required threshold of an armed conflict.[73] The notion of armed conflict is not the only one that plays a major role in applicability of IHL. As it is seen from further chapters, most of the rules of targeting apply only to a specific form of military action – attacks. Similarly, as in the case of armed conflict, it is not yet evident whether minor incidents, such as temporal satellite signal jamming, constitute attacks and invoke application of IHL. Invocation of IHL is even more complicated if minor incidents were caused by a non-state group, since the standard of intensity set by international military tribunals is relatively high to distinguish non-international armed conflicts from banditry, unorganized and short-lived insurrections.[74] Therefore, the Author deems necessary to discuss the threshold of armed conflict and how it differs in context of international and internal hostilities.

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70 Michael Aaron Dennis, "Internet," Britanica, 2022, https://www.britannica.com/technology/Internet.

71 CERN, "Where the Web Was Born," accessed September 29, 2021, https://home.cern/science/computing/birth-web/short-history-web.

72 Convention (I) for the Amelioration of the Condition of the Wounded and Sick in the Armed Forces in the Field, Aug. 12, 1949, 75 U.N.T.S. 31 (hereinafter – GCI); Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Aug. 12, 1949, 75 U.N.T.S. 85 (hereinafter – GCII); Convention (III) relative to the Treatment of Prisoners of War, Aug. 12, 1949, 75 U.N.T.S. 135 (hereinafter – GCIII); Convention (IV) relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 75 U.N.T.S. 287 (hereinafter – GCIV);

1977 IAP; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), Jun. 8, 19777, 1125 U.N.T.S. 609 (hereinafter – 1977 IIAP).

73 *See* Solis, *The Law of Armed Conflict. International Humanitarian Law in War*. P. 152.

74 Prosecutor v. Tadic, Opinion and Judgement, IT-94-1-T, para. 562.

At first glance, ISL regime, especially certain rules scripted in the OST, portray this branch of international law not only to be regulating peacetime conduct, but also promoting peaceful activities and, accordingly, prohibiting hostile activities in outer space.[75] This perception may appear from reading cardinal clauses requiring the states to conduct their activities in outer space for peaceful purposes only and completely demilitarise celestial bodies. To better understand international obligations under ISL, the notion of "peaceful purposes" – being general in nature – is analyzed in this chapter, whilst specific rules prohibiting conduct in outer space are presented afterwards.

Fourthly, as seen further, IHL and ISL have multiple cross points where certain rules of each branch of international law are in tension with one another, if not in conflict. In case of IHL and ISL potential conflict of laws it needs to be established which should be primarily applied and why. Several discussions have already been made on IHL's relationship with other branches of international law, such as *jus ad bellum* or IHRL, however, none of the judicial bodies have contemplated the question of IHL's and ISL's relationship. This chapter seeks to disclose relative normative conflict resolution mechanisms under international law, related jurisprudence, proposed solution models, IHL's interaction with other branches of international law and propose a model of IHL and ISL potential normative conflict resolution mechanism.

1.2. Geographical scope of IHL application and outer space as a theatre of war

The validity and application of rules of international law are primarily conditioned by geography of a party to an international instrument where it fully implements its sovereign rights. According to Article 29 of the Vienna Convention on the Law of Treaties (hereinafter – VCLT), "unless a different intention appears from the treaty or is otherwise established, a treaty is binding upon each party in respect of its entire territory."[76] There are rules of international law that outlaw some sovereign rights of States in certain determined territories. Outer space and celestial bodies are examples of this. It is indicated in the OST that neither outer space, nor the Moon and other celestial bodies, are subject to national appropriation by claim of sovereignty.[77]

The area where the armed conflict takes place is commonly called theatre of war or region of war. A theatre of war comprises the territories subject to the sovereignty of the belligerent states which include land, internal waters, archipelagic waters, territorial sea, subsoil, and submarine areas underneath these expanses of land and water,

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75 For example, the Preamble of OST emphasizes the "importance of international co-operation in the field of activities in the peaceful exploration and use of outer space"; Article III of OST requires to conduct outer space activities in accordance with international law with the "interest of maintaining international peace and security"; Article IV of the OST requires to use celestial bodies "exclusively for peaceful purposes", etc.

76 *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 331.

77 Outer Space Treaty, Art. II.

continental shelf, and air space above them.[78] Since States may not legally possess territorial jurisdiction in outer space and celestial bodies, does that mean that 1949 Geneva conventions and their 1977 additional protocols are precluded from application in outer space?

Common article 2 of the 1949 Geneva conventions[79] reads as follows:

"<…> present Convention shall apply to all cases of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognized by one of them. <…> The Convention shall also apply to all cases of partial or total occupation of the territory of a High Contracting Party, even if the said occupation meets with no armed resistance. <…>"

Notions "all cases of declared war" and "any other armed conflict" in Common Article 2 indicate that application of Geneva conventions is not conditioned by the common criteria of the territory of the party to the conflict, but rather by the fact of armed confrontation between parties to 1949 Geneva conventions no matter where these confrontations take place. The armed force might be used legally or in breach of international obligations against the peoples or objects in any other state's territory, in an open sea, in the territory of the neutral state, Antarctica or any other territory where territorial jurisdiction of a party to the conflict is present, limited or even lacking. The target that is being attacked is relevant for application of IHL in most cases, not the territory where it is being attacked. In this context, it may also be noted that the territory itself (like mountain pass or a forest where enemy armed forces are hiding) may constitute a military objective and be subjected to attacks (see "2.2 Targetability of satellites and the notion of military objective"). Even though some international instruments limit the use of force in certain territories, the application of 1949 Geneva conventions is not limited spatially.[80] Moreover, the fact that the use of force is in breach of international obligations does not preclude application of IHL. *Jus ad bellum* (or the law of the use of force) and *jus in bello* are two separate bodies of law with different historical origins and paths of development.[81] IHL applies in all cases of armed conflict to all parties to the armed conflict despite implications on legality of the use of force or which party is the aggressor and which acts in accordance with principles set in the United Nations Charter (hereinafter – UN Charter).[82] The principles of IHL, such as proportionality, distinction, military necessity, unnecessary suffering, or precautions in attacks were formulated with realization that they should not make the warfare itself illegal, neither make a criminal out of any soldier. Certain degree of violence, collateral damage, deaths, injuries, and destruction is permissible under IHL

78 Dinstein, Yoram. *War, Agression & Self-Defence*. Cambridge: Cambridge University Press, 2003. P. 19.

79 Common article 2 (and some other articles) are so called because they are identically formulated in all second articles of 1949 Geneva conventions, that is GCI, GCII, GCIII, and GCIV.

80 Blake, "Military Strategic Use of Outer Space." 132.

81 Jasmine Moussa, "Can Jus Ad Bellum Override Jus in Bello? Reaffirming the Separation of the Two Bodies of Law," *International Review of the Red Cross* 90, no. 872 (2008): 963–90. 965.

82 Charter of the United Nations, Jun. 26, 1945, 1 U.N.T.S. XVI (hereinafter – UN Charter).

as a natural consequence of warfare.[83] Therefore, the conduct of hostilities in prohibited or restricted geographical areas may not inflict peculiarities of application of IHL. Outer space should not be an exception.

There is no binding international treaty specifically regulating air, cyber or outer space warfare. But that does not mean that IHL is applicable only in two domains of war and, for instance, those wounded and sick transported by the plane or, in highly unlikely but possible circumstances, left wounded in the ISS or other space object are unprotected by IHL. The rules that evolved in relation to warfare on land have been adopted, adapted, or developed to the particular situations that arise in connection with maritime or air warfare.[84] As it has already been noted, it is widely accepted that 1949 Geneva conventions are applicable to any theatre of war.[85]

The titles of the first two Geneva conventions suggest that these treaties are limited in space, namely, 1949 Geneva Convention for the amelioration of the condition of the wounded and sick in armed forces in the field (hereinafter – GCI) is only applicable in land and 1949 Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (hereinafter - GCII), accordingly, at sea. As Article 4 of the GC II states, "[f]orces put ashore shall immediately become subject to the provisions of the Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field of August 12, 1949." Article 49 of the IAP suggests spatial application of it, as Paragraph 3 clearly states that the Section applies to land, air or sea warfare which may affect the civilian population, individual civilians or civilian objects on land. However, paragraph 2 notes that the provisions of IAP with respect to attacks apply to all attacks in whatever territory conducted. The authors of the ICRC Commentary of the IAP (hereinafter – ICRC IAP Commentary) explained that the lack of specific rules of sea or air warfare and "unclear customary law" lead to listing these theatres of war in the article.[86] In other words, the list of theatres of war is not necessarily conclusive, especially bearing in mind that military advancement which was present by the time of drafting mentioned documents is not comparable to current military cyber or space technologies.

Since there have not been yet an armed conflict in outer space, naturally, there have not been any disputes where a judicial body would have to face the question of IHL applicability in outer space. Despite this, certain general observations concerning IHL applicability have already been made. In 1994, United Nations General Assembly being concerned about the continuous development of nuclear weapons despite its numerous resolutions where it declared that the use of nuclear weapons would be a

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83 Moussa, "Can Jus Ad Bellum Override Jus in Bello? Reaffirming the Separation of the Two Bodies of Law." 967.

84 Leslie Green, *The Contemporary Law of Armed Conflict*, 2nd ed. (Manchester: Manchester University Press, 2000). 122.

85 Green. 181.

86 Claud Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Geneva: Martinus Nijhoff Publishers, 1987). Paras. 1895-1898.

violation of UN Charter requested an opinion from the International Court of Justice (hereinafter – ICJ) on the legality of the threat or use of nuclear weapons.[87] ICJ did not reach a definite conclusion on legality or illegality of nuclear weapons,[88] however, it did make a definite statement concerning application of IHL not only to nuclear weapons, but all forms of warfare in general. ICJ asserted 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."[89] This seemingly simple statement has been used as an argument to address IHL's applicability in other fields, such as cyber space.[90]

Outer space as a military domain with indications of IHL applicability in outer space is increasingly being recognized by multiple states and organizations. Major military superpowers consider outer space as a 5th military domain.[91] However, it should also be noted that national laws (indicating *opinio juris* of states) have not developed widely yet, since most states have rather limited participation in outer space activities compared to major space superpowers. Only few countries have adopted the laws recognizing applicability of rules of warfare to the outer space domain.[92]

It is stated in the United States Law of War Manual that "[c]ertain treaties apply only in certain geographical locations (such as a State's own territory), and thus might not create obligations applicable to a State's activities in outer space. However, law of war treaties and the customary law of war are understood to regulate the conduct of hostilities, regardless of where they are conducted, which would include the conduct of hostilities in outer space. In this way, the application of the law of war to activities in outer space is the same as its application to activities in other environments, such as the land, sea, air, or cyber domains."[93] It is seen from the text of Australian manual that outer space may be used for non-aggressive military use of space, such as surveillance, reconnaissance, navigation, meteorology and communications and only few restrictions upon these areas are place under the number of international

87 G.A. Res. 49/75, U.N. Doc. A/RES/49/75 (Jan. 9, 1995), 15.

88 Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. para. 97 (8 July, 1996) (hereinafter - ICJ Nuclear weapons opinion).

89 ICJ Nuclear weapons opinion, para 86.

90 See Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*, 451.

91 See "3.2. Geographical scope of application of IHL and outer space as a theatre of war".

92 It should also be said that even major space super powers have significantly different budgetary funds allocated to space programmes and weighting the significance of voice (*opinio juris*) to formation of a custom merely by the fact of a country being called space superpower is at least not accurate. For instance, the difference of share of GDP of G20 governments' space budget indicating quantitative involvement in outer space activities between the highest of United States and the lowest of Mexico is more than 200 times. Only few states adopted national laws indicating their position on the use of space for military purposes, including applicability of IHL to military space activities.

93 Department of Defense Law of War Manual, Department of Defense Law of War Manual § (2016), 941-942, https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190.

agreements.[94] Space domain is also mentioned in the Commander Joint Task Force duties of joint targeting in the Australian targeting manual.[95] According to the Russian Military Doctrine, the intention of states to place weapons in outer space is an external military risk[96] and exercising simultaneous pressure in outer space on the enemy throughout the enemy's territory is indicated as a 'characteristic' of current military conflicts.[97] In 2019, NATO adopted space policy and recognised space as a new operational domain, alongside air, land, sea and cyberspace.[98]

It may be said that military domain of space is being increasingly recognised by states or organizations where the states participate and express their will. The Author found no sources of state practice showing that outer space might be precluded from application of IHL. Cyber space, outer space and even not yet defined space may not be excluded from application of IHL merely for the verbatim reading of Geneva conventions. As long as state activities trigger the need of protection of persons not participating in an armed conflict or civilian objects, IHL applies. IHL is unique because it applies independently from moral or legal justification of the use of force, independently where from, where to or against whom the force is used, independently from jurisdiction, state recognition, neutrality, and in most cases – independently from participation in treaties, because (as it will be explained in further chapters) customary IHL covers a huge portion of the scripted law.

1.3. The threshold of international armed conflict

It has been found that IHL applies to outer space equally as to any other theatre of war, since application of IHL is conditioned by the fact of the use of force, not the legality of the use force, including prohibitions related to the use of force in certain territories. However, it is not always easy to determine when the use of force can be qualified as an armed conflict or merely border incident or other act short of war. The determination of the threshold of armed conflict, either international or non-international one, is important for legal analysis of targeting because activities which do not qualify for armed conflict need not to be guided by targeting rules. The analysis of the threshold of the armed conflict helps to better understand the legal context of satellite attacks. As it is seen further, ASAT attacks conducted by a state and non-state actors have different legal weight and, in some cases, are restrained by targeting rules,

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94 Australian Royal Air Force Operations Law for RAAF Commanders (APP 1003), 13, https://usnwc.libguides.com/ld.php?content_id=2998112.

95 Australian Defense Force Australian Defence Doctrine Publication 3.14 "Targeting", 2-5, para. 2.15, https://usnwc.libguides.com/ld.php?content_id=11727121.

96 The Military Doctrine of the Russian Federation, December 25, 2014, No. Pr.-2976. Para. 12(d), https://thailand.mid.ru/en/military-doctrine-of-the-russian-federation.

97 Military Doctrine of Russia, para. 15(c).

98 Kęstutis Paulauskas, "NATO's approach to space", NATO Review, accessed April 13th, 2021, https://www.nato.int/cps/en/natohq/topics_175419.htm

in others – not. The legal thresholds determining whether the situation amounts to armed conflict in outer space and invokes application of IHL will be discussed further.

Before analysing the notion of armed conflict, the Author believes that it is important to shortly disclose the relationship between *jus in bello* and *jus ad bellum* or, in other words, the relationship of IHL and UN Charter use of force legal regime, to guide the reader in a correct path of understanding. The tradition of distinguishing *jus in bello* and *jus ad bellum* regimes is long and the two concepts were interpreted to be independent from one another way before the adoption of UN Charter.[99] The preamble of 1977 IAP specifically addresses this issue by saying that "the provisions of the Geneva conventions of 12 August 1949 and of this Protocol must be fully applied in all circumstances to all persons who are protected by those instruments, without any adverse distinction based on the nature or origin of the armed conflict or on the causes espoused by or attributed to the Parties to the conflict."[100] One may argue that although *jus ad bellum* and *jus in bello* regulate different legal environments, the application of the latter is dependent from the former, that is, an act of aggression (or use of force in self-defence accordingly) invokes application of IHL. However, it should be noted that neither 1949 Geneva conventions, nor 1977 IAP do not use "aggression" as a term to define armed conflict, nor "use of force", "armed force" or "self-defence." While Article 51 of the UN Charter uses the term "armed attacks",[101] IAP in Article 49 use "attacks". The authors of ICRC IAP Commentary indicate that even though the definition of aggression was already adopted by UNGA in 1974,[102] it was decided in the CDDH not to include definition of aggression, as the fact of being an aggressor or the victim of aggression does not absolve anyone from his obligations nor deprive anyone of the IHL's vested guarantees.[103] In other words, the protection of victims of the armed conflict, including the one indirectly vested by the rules of targeting, does not depend from the perception of legality of the use of force, including instruments prohibiting aggression or allowing self-defence. Moussa called the linking of *jus ad bellum* and *jus in bello* being a danger for respecting the principles of humanity.[104] The Author is of the view that the use of the mentioned *jus ad bellum* notions ("aggression",

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99 See François Bugnion, "Just Wars, Wars of Aggression and International Humanitarian Law," *International Review of the Red Cross* 84, no. 847 (2022): 523–46, Carsten Stahn, "'Jus Ad Bellum', 'Jus in Bello' … 'Jus Post Bellum'? – Rethinking the Conception of the Law of Armed Force," *The European Journal of International Law* 17, no. 5 (2007): 921–43, 925.

100 Preamble of 1977 IAP.

101 "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.", Article 51, Un Charter.

102 United Nations General Assembly. *Definition of Aggression*. Resolution adopted by the General Assembly Twenty-ninth session Agenda item 3314, UNDOC A/RES/29/3314.

103 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*.

104 Moussa, "Can Jus Ad Bellum Override Jus in Bello? Reaffirming the Separation of the Two Bodies of Law", 989-990.

"self-defence", "use of force") to define the threshold of IHL's application are not in itself reprehensible, however, may mislead to thinking that *jus in bello* application is conditioned by *jus ad bellum* regime. IHL has its own applicability standards which are first and foremost related with the notion of armed conflict – the *sui generis* legal term used in 1949 Geneva conventions and 1977 IAP and discussed further. Moreover, from targeting perspective, not only an armed conflict but rather the notion of "attack" is the cornerstone to analysing targeting rules (see "3.3. ASAT technologies and the concept of attacks under IHL"). For these reasons, it should be emphasized that any normative *jus ad bellum* analysis, including which acts constitute or are short of aggression and, importantly, the threshold of armed attack invoking the right to self-defence, is irrelevant for research results and does not fall under the scope of this thesis.

Most of the written rules of IHL are applicable only during international armed conflicts. Common article 2 quoted previously[105] lists scenarios which make the conflict international in nature. Compared to previous international treaties governing rules of warfare, Geneva conventions presented a novel standard of the application of IHL adding the notion of the "armed conflict" supplementing the technical sense of war with material sense of war.[106] Indeed, Article 2 of the 1907 Hague Convention (III)[107] required states to declare war or ultimatum before commencing to the hostilities. That meant that application of IHL[108] could have been subjected to the will of parties because they had a choice: to declare war and to conduct hostilities in accordance to laws of war or not to declare war and conduct hostilities not necessarily in accordance to laws of war. 1949 Geneva conventions eliminated that option by introducing the notion of armed conflict. Since 1949, the law of war became applicable irrespectively from proclamation of war by State organs, but merely by the engagement of the armed forces. On the other hand, the term "armed conflict" was not defined in 1949 Geneva conventions and that led to various studies, interpretations, manipulations, and debates.[109] The authors of 1952 Commentary of the 1949 Geneva conventions stated that "Convention becomes applicable as from the actual opening of hostilities. The existence

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105 See "3.2. Geographical scope of application of IHL and outer space as a theatre of war".

106 Concepts of "War in technical sense" and "war in material sense" were introduced by Yoram Dinstein. "War in technical sense" commences with a declaration of war and terminated with a peace treaty, while "war in material sense" disregards any formal steps and the law of war becomes applicable as soon as hostilities take place.

107 Convention relative to the Opening of Hostilities (Hague Convention III), opened for signature 18 October 1907, 205 CTS 264 (entered into force 26 January 1910), art. 1.

108 It should be noted that the term "international humanitarian law" was only introduced in 1966 by Jean Pictet. In time of 1907 rules governing conduct in hostilities (*jus in bello*) and right to conduct hostilities (*jus ad bellum*) were usually named "law of war". See Justinas Žilinskas and Tomas Marozas, *Tarptautinė Humanitarinė (Ginkluoto Konflikto) Teisė. I Dalis.* (Vilnius: Registrų centras, 2016), 62-63.

109 In 2010, International Law Association drafted a report specifically aimed to define the notion of armed conflict which combined most of the existing and prevailing state practice, jurisprudence and scientific opinions in one single document. *See* Mary International Law Association, 2010. "Final Report on the Meaning of Armed Conflict in International Law." In *The Hague Conference*, edited by Mary Ellen

of armed conflict between two or more Contracting Parties brings it automatically into operation. <…> Any difference arising between two States and leading to the intervention of armed forces is an armed conflict within the meaning of Article 2, even if one of the Parties denies the existence of a state of war."[110] In other words, according to this interpretation, IHL is applicable only if at least two Parties of the armed conflict use their armed forces against each other. Such understanding has been claimed to be "too narrow" in the 2016 Commentary update where it was argued that unilateral use of force by one State against another, such as unconsented-to invasion or deployment of a State's armed forces on the territory of another State, even if the other state takes no defensive action, meets the conditions for an international armed conflict.[111] What is also important, is that the use of armed force needs not to be necessarily directed against the armed forces of the enemy, since civilians, the territory and infrastructure, if targeted or otherwise affected, would invoke application of IHL.[112] The practice of international courts support that view.[113] Moreover, since the adoption of Protocol Additional to the Geneva conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (hereinafter – API), the fight of peoples against colonial domination, alien occupation and racist regimes in the exercise of right to self-determination is also considered as an international armed conflict despite the fact that it might take place only in the territory of one state.[114]

Despite the fact that Geneva conventions do not indicate the requirement of intensity or duration of the international armed conflict as a prerequisite armed conflict qualification criteria, many times the states did not consider minor clashes of armed force between them, especially cross-border incidents, as armed conflicts.[115] Some scholars argue that classification of military action as armed conflict or an "act short

O'connell and Judith Gardam, 1–33. The Hague, 2010, Dinstein, Yoram. *War, Agression & Self-Defence* (Cambridge: Cambridge University Press, 2003), 9.

110 Knut Dörmann et al., *Commentary on the First Geneva Convention: Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field* (Geneva: International Committee of the Red Cross, 1952), 32.

111 International Committee of the Red Cross, *Commentary on the First Geneva Convention: Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field*, 2nd ed. (Cambridge: Cambridge University Press, 2016), 223-224.

112 International Committee of the Red Cross. GCI Commentary, 224.

113 ICTY in Tadic case took the view that "an armed conflict exists whenever there is a resort to armed force between States". That definition was widely cited in other cases of ICTY and other courts. Prosecutor v. *Dusko Tadic,* Decision on the Defence Motion for Interlocutory Appeal on Jurisdiction, IT-94-1-T, 2 October 1995, para. 70. See Prosecutor v. *Zlatko Aleksovski*, IT-95-14/1-T, 25 June 1999, para. 43; Prosecutor v. *Anto Furundzija,* IT-95-17/1-T, 10 December 1998, para 59; Prosecutor v. *Ante Gotovina, Ivan Cermak, Mladen Markac,* IT-06-90-T, 15 April 2011, para 1674; The Prosecutor v. *Jean-Paul Akayesu,* ICTR-96-4-T, para. 619.

114 API, Art. 1.

115 International Law Association, "Final Report on the Meaning of Armed Conflict in International Law," *The Hague Conference* (The Hague, 2010), 13, http://www.ila-hq.org/en/committees/index.cfm/cid/1022.

of war" depends on how parties to the conflict appraise the situation and protraction of the conflict.[116]

In 1995, International Criminal Tribunal for the former Yugoslavia (hereinafter – ICTY) passed the decision on the defence motion for interlocutory appeal on jurisdiction in *Tadić* case, where the court explicitly indicated that intensity requirements are "applicable to both international and internal armed conflicts".[117] The Court's findings that "[t]here has been protracted, large-scale violence between the armed forces of different States" should indicate, that the threshold of international armed conflict is somewhat similar to the internal armed conflict. However, these two quoted sentences should not be taken out of context, especially bearing in mind the opening statement of the Court concerning qualification of armed conflict. ICTY made a clear distinction between levels of intensity in international armed conflicts and non-international armed conflicts: "we find that an armed conflict exists whenever there is a resort to armed force between States or protracted armed violence between governmental authorities and organized armed groups or between such groups within a State."[118] To put it in other way, it is not the protraction or intensity that qualifies the international armed conflict, but the resort to armed force between states. Even though ICTY in the *Tadić* trial judgement indicated that the level of intensity of the conflict in the territory of the Federal Republic of Yugoslavia was sufficient,[119] it should be stressed that this statement was given in context of the use of force between states, but not the analysis of the amount of the use force between states. The Court in the *Tadić* trial judgement did not legally qualify the quantitative aspects of the use of force between states and it cannot be concluded that intensity of international armed conflict is a decisive factor qualifying a conflict as international armed conflict, similarly as in case of non-international armed conflicts (see "1.4. The threshold of non-international armed conflict").

According to the ICRC, there is no such requirement for the international conflict to attain certain level of intensity, including protraction, and all acts involving the use of force by one state against the other is international armed conflict invoking application of IHL.[120] The authors of the updated 2016 GCI Commentary indicate that for "international armed conflict, there is no requirement that the use of armed

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116 Yoram. Dinstein, *War, Aggression, and Self-Defense* (Cambridge University Press, 2001), 11; Gary D. Solis, *The Law of Armed Conflict: International Humanitarian Law in War* (Cambridge: Cambridge University Press, 2010), 152.

117 Prosecutor v. Tadić, (Decision on the Defence Motion for Interlocutory Appeal on Jurisdiction), IT-94-1, para 70.

118 Prosecutor v. *Dusko Tadic,* Decision on the Defence Motion for Interlocutory Appeal on Jurisdiction, IT-94-1-T, 2 October 1995, para. 70.

119 Prosecutor v. *Dusko Tadic,* Trial Champer Opinion and Judgement, IT-94-1-T, 7 May 1997, para. 569.

120 International Committee of the Red Cross, "How Is the Term 'Armed Conflict' Defined in International Humanitarian Law?," 2008, https://www.icrc.org/en/doc/assets/files/other/opinion-paper-armed-conflict.pdf.

force between the Parties reach a certain level of intensity before it can be said that an armed conflict exists."[121] Minor skirmishes, any unconsented-to military operations, even the capture of adversaries by one of the parties to the conflict would suffice to apply IHL.[122] The irrelevance of intensity in case of international armed conflicts could also be supported teleologically. As mentioned, the drafters of Geneva conventions intentionally added the notion of "armed conflict" so as the states could not manipulate application of IHL merely by omission of proclamation of war. The "objectivised" application of Common article 2 would still be very much subjective, if the party to the armed conflict had an option to choose whether to apply IHL merely for the reason that it holds that the use of armed force is "short of war", "isolated" or not "protracted" enough. After 1949 when Geneva conventions were adopted, civilians, *hors de combat* or captured combatants were shielded with legal protection which since then has been continuously conditioned by the facts, but not opinions of states.

However, it should also be noted that the view of ICRC requiring low intensity for international armed conflicts and jurisprudence of international courts has not been accepted universally. For instance, International Law Association (hereinafter – ILA) in its 2010 Final Report on the Meaning of Armed Conflict in International Law stated that it found little evidence to support the view that 1949 Geneva conventions apply in the absence of fighting of some intensity and applied requirement of intensity to both, international and non-international armed conflicts.[123] Greenwood,[124] Solis,[125] Dinstein,[126] and other authors agree that low-intensity border incidents between states should not be treated as international armed conflicts. Solis argues that intention of one party to the conflict to pursue with the use of force should be established to characterise the clash between the states as armed conflict.[127]

Even though the ICRC's low-intensty view is the prevailing one in literature,[128] there is no common agreement on the threshold of international armed conflict. Despite the miscellaneous state practice, the Author upholds the view of ICRC as being more reflective to the purpose of IHL – granting the protection to all the persons not participating or no longer participating in an armed conflict and objects having no military value

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121 International Committee of the Red Cross, *Commentary of the First Geneva Convention - Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field*, ed. Knut Dörmann et al. (Cambridge: Cambridge University Press, 2016), 85.

122 International Committee of the Red Cross, *2016 Commentary of the First Geneva Convention,* 86.

123 International Law Association, "Final Report on the Meaning of Armed Conflict in In," in *The Hague Conference*, ed. Mary Ellen O'connell and Judith Gardam (The Hague, 2010), 1–33, 1-2.

124 Christopher Greenwood, "Scope of Application of Humanitarian Law," in *The Handbook of International Humanitarian Law2*, ed. Dieter FLeck, 2nd ed. (Oxford: Oxford University Press, 2008), 48.

125 Solis, *The Law of Armed Conflict. International Humanitarian Law in War,* 152.

126 Yoram Dinstein, *War, Agression & Self-Defence* (Cambridge: Cambridge University Press, 2003), 11.

127 Solis, *The Law of Armed Conflict,* 152.

128 Terry D. Gill, "Some Reflections on the Threshold for International Armed Conflict and on the Application of the Law of Armed Conflict in Any Armed Conflict," *International Law Studies* 99 (2022), 701.

(see "2.2.1 Objective element of military objective"). First, it has been already discussed that Common article 2 of Geneva conventions was adopted for the reason to objectivize application of IHL. In Author's view, a state being a party to IHL instruments should not have the right to decide when to apply these instruments. Otherwise, Geneva conventions being four of the most ratified international treaties, would have questionable adaptability to hostile conduct. Secondly, application of law, including IHL, requires certain factual demand. For instance, a minor border incident might end quickly and parties involved might have no demand to be protected by IHL without any wounded or captured soldiers, damaged civilian objects, etc. On the other hand, it would be reasonable to expect from the commander planning an attack that he or she would not choose a civilian or civilian object as a target, even if such an attack was planned to be an isolated event. In other words, the applicability of IHL to conflicts of international character should not be determined by the willingness or ability of an attacking state to apply IHL or the number of hours or days of conflict protraction, but rather by the perception of international obligations and state conduct fitting that legal framework.

For all of the mentioned reasons, the Author believes that, from legal perspective, intentional use of armed force of one state against the other, even if the use of force is an isolated incident having no further consequences, even if the use of force is very limited, even if there are no casualties, should be legally evaluated through the spectrum of IHL obligations as long as such conduct corresponds to the legal framework of IHL and there is an objective demand for it. The use of armed force against the satellite of another state should be conditioned by the IHL rules of targeting without the necessity of considerations whether such incident led to further armed confrontation or was part of protracted armed violence. Any isolated attack on a satellite should involve considerations of satellite targetability and targeting principles is such an attack pose threat to the protected under IHL, even if intensity is low. Same may not be said about non-international armed conflicts.

1.4. The threshold of non-international armed conflict

Private companies have been participating in outer space activities as contractors to governments for years, however, only recently there has been a shift in their role. The NATO Economic and Security Committee has published a report where it stated that "[o]ne of the features of new space is that private firms are no longer simply operating as contractors to nation states but are themselves becoming key protagonists in space."[129] Non-state armed groups should not be underrated and left out of the legal considerations of IHL. They are potential parties to non-international armed conflict in outer space and, therefore, it would be thoughtful to describe the threshold of non-international armed conflict as well.

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129 Jean-Marie Bockel, "The Future of the Space Industry. General Report," 2018, https://www.nato-pa.int/download-file?filename=/sites/default/files/2018-12/2018 - THE FUTURE OF SPACE INDUSTRY - BOCKEL REPORT - 173 ESC 18 E fin.pdf.

The two main legal sources regulating conduct in hostilities during non-international armed conflicts is the Common article 3 of the Geneva conventions and 1977 Protocol Additional to the Geneva conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II) (hereinafter – APII).[130] These two sources set two different regimes of non-international armed conflicts, application of which will further be explained.

The text of Common article 3 states, that this article is applicable "in case of an armed conflict not of international character occurring in the territory of one of the High Contracting Parties". Armed conflicts "not of an international character" are those where at least one party is not a State.[131] The common example of non-international armed conflict involves a non-state group on one side and the government on the other. In addition, it is widely accepted that non-international armed conflicts in the sense of Common article 3 also include conflicts only between non-State armed groups without the involvement of the Government itself, especially in cases when there is no legitimate government or it is ineffective.[132]

It is seen from the text of Common article 3 that internal armed conflict is defined through negation being "not international in character". This definition is relatively broad and verbatim reading would allow to qualify any activity of a criminal group being party to the conflict despite the nature, number, or protraction of its activities. Nevertheless, the doctrine[133] and jurisprudence[134] crystalized the minimum set of two

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130 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977, 1125 UNTS 609 (hereinafter – APII).

131 International Committee of the Red Cross. *Commentary on the First Geneva Convention: Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field*. Commentaries on the 1949 Geneva Conventions. Cambridge: Cambridge University Press, 2016 (hereinafter - ICRC GC I 2016 Commentary), para 393.

132 ICRC GC I 2016 Commentary, para 394.

133 Jean Pictet in the Commentary of the Geneva Conventions listed non-obligatory indicative factors of non-international armed conflict. These are: (1) That the Party in revolt against the de jure Government possesses an organized military force, an authority responsible for its acts, acting within a determinate territory and having the means of respecting and ensuring respect for the Convention. (2) That the legal Government is obliged to have recourse to the regular military forces against insurgents organized as military and in possession of a part of the national territory. (3) (a) That the de jure Government has recognized the insurgents as belligerents; or (b) that it has claimed for itself the rights of a belligerent; or (c) that it has accorded the insurgents recognition as belligerents for the purposes only of the present Convention; or (d) that the dispute has been admitted to the agenda of the Security Council or the General Assembly of the United Nations as being a threat to international peace, a breach of the peace, or an act of aggression. (4) (a) That the insurgents have an organisation purporting to have the characteristics of a State. (b) That the insurgent civil authority exercises de facto authority over persons within a determinate territory. (c) That the armed forces act under the direction of the organized civil authority and are prepared to observe the ordinary laws of war. (d) That the insurgent civil authority agrees to be bound by the provisions of the Convention. Pictet, Jean, ed. The Geneva Conventions of 12 August 1949: Commentary, I Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Fores in the Field. Volume 1. Geneva: International Committee of the Red Cross, 1952. P. 49-50.

134 Tadic trial judgement, para. 561-568.

criteria allowing to separate armed conflict from banditry, unorganized and short-lived insurrections or other activities not subjected to IHL. The first criteria is organization of non-state party to the conflict and the second – intensity of the conflict.[135] The level of organization of a non-state party to the conflict is required to be such that the group was capable of carrying out obligations imposed by Common article 3.[136] The level of intensity needs to be measured on the case-by-case basis taking in mind such factors as duration of the conflict, number and frequency of military engagements, the type of military equipment used, number of munitions fired, number of participating persons, number of casualties, amount of collateral damage, including the amount of destruction of civilian objects and number civilian deaths, etc.[137] The Inter-American Commission on Human Rights (hereinafter – IACHR) in *La Tablada* case claimed that in practice, it is most difficult to assert not the upper end of the spectrum of internal disturbances, but rather the lower end. The line separating an especially violent situation of internal disturbances from the lowest level of Common article 3 armed conflict may sometimes be blurred and, thus, not easily determined.[138] The armed confrontation between Movimiento Todos por la Patria and Argentinian armed forces in the military barracks in La Tablada (in Argentina), took only 30 hours of intense use of military force, however, IACHR classified this situation as a non-international armed conflict due to the nature of the hostile acts of the attackers, the involvement of governmental armed forces, the captured military object and the number of casualties.[139] The requirement of protraction of armed violence in that case was overwhelmed by the massive Argentinian military campaign to retake control of the military object. It is the shortest known non-international armed confrontation where a judicial body qualified it as an armed conflict and serves more like an exception (concerning requirement of conflict intensity) than the precedent.

Compared to Common article 3 non-international armed conflict regime requirements, 1977 APII application is even stricter. Alongside Common article 3 criteria of organization and intensity, APII requires a non-state armed group to control part of the territory of the Party to the conflict. Moreover, unlike Common article 3, APII does not apply to conflicts between non-governmental armed groups. It is clearly stated in Article 1 of the APII, that this Protocol is applicable to armed conflicts between armed forces of the High Contracting Party, and dissident armed forces. The common example of APII armed conflict is a civil war.

Conflicts "not of an international character", according to Common article 3, occur in the territory of one of the Parties to Geneva conventions (and/or APII). Since

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135 Tadic trial judgement, para. 562.

136 Lindsay Moir, *The Law of Internal Armed Conflict* (Cambridge: Cambridge University Press, 2004), 36.

137 Tadic trial judgement, para, 562

138 *Inter-American Commission on Human Rights,* Case No. 11.137: Argentina, OEA/ Ser/L/V/II.98, doc. 6 rev. 13 April 1998, (hereinafter – IACHR La Tablada) https://www.cidh.oas.org/annualrep/97eng/Argentina11137.htm.

139 IACHR La Tablada, 155.

all states have ratified Geneva conventions, the territorial boundary set by Common article 3 is irrelevant in the context of land.[140] However, it was already mentioned that outer space and celestial bodies are not subject to territorial appropriation. Does that preclude any non-international armed conflict in outer space? Taken into consideration present technological capabilities and the fact that neither state nor non-state actors would find reasonable to conduct hostilities in outer space, including any of the celestial bodies, this question might seem irrelevant. However, there is no need for a member of non-state group to step onto the land of the attacked state for the conflict to be qualified as non-international and fit the wording "in the territory of one of the High Contracting Parties". First of all, if a satellite was targeted by an organized armed group of non-state actors, the attack would still be implemented from the certain territory (or territories) of the Earth shielded by Geneva conventions. Accordingly, APII would be equally applied if a non-state armed group controlled the territory on Earth, not a celestial body in outer space. Only if human beings settled outside of the Earth and were able to conduct military activities against the objects in space, there would be the need to review or reinterpret the language of Common article 3 or APII. Although this scenario is unlikely in the nearest future, it is reasonable to expect that individuals forming new settlements in celestial bodies of outer space would be governed by either laws of existing Earth state or be self-governed international entity, in such a case having sovereign rights including ability to sign international agreements. On the other hand, it is unpractical to contemplate the question further and speculate without any visible or predictable facts.

Unlike the international armed conflict, the requirement of intensity of the non-international armed conflict precludes any isolated attacks against space assets to be qualified as an armed conflict, at least if they do not form part of systemic protracted armed violence against the government or other organized non-state group. The lowest threshold of non-international armed conflict in La Tablada involved 30 hours of intense heavy artillery fighting. The odds of a non-international armed conflict in space reach similar level of intensity are very low. What is more likely, is that a non-state armed group alongside its Earth activities would also target space assets of the opposing party and that isolated act would be covered by rules of an already ongoing non-international armed conflict. An isolated attack of a non-state group against a target in outer space would not suffice to meet the intensity requirement of non-international armed conflicts. Such an attack would be regulated by other laws than IHL, such as national criminal law and other.

According to the current dichotomic IHL international and non-international armed conflict regimes, the destruction of a satellite owned by one state caused by the

140 It should be noted that Taiwan, Western Sahara, New Caledonia, Puerto Rico and Falkland Islands are not parties to Geneva conventions, however, despite the questioning of their status as states, it is believed that the territory would still be governed by the patrimonial state of interest. It should also be noted that the territory of Antarctica is also not covered by Geneva conventions, the status of which is determined by the Treaty of Antarctica.

activities of the other state should invoke application of IHL if there was a humanitarian demand. However, if the same amount of violence was used by a non-state group (as an isolated act) – IHL in most cases would not apply, unless a satellite attack constituted part of ongoing non-international armed conflict.

1.5. The notion of "peaceful purposes" in OST

Although application of IHL is not limited in space, the geographical limits under *jus ad bellum* may as well help to understand the subject better. Specific agreements might limit or even prohibit the use of force or any other military activities in these or other regions. The usual conjunction of words used in treaties and agreements to limit the military use of a certain territory is "peaceful purposes", however, different circumstances of the adoption of those legal instruments and different state practice in certain territories caused ununified and sometimes even dynamic understanding of this notion. In many instances, the question that scholars raise when interpreting "peaceful purposes" is whether such notion prohibits any military activities or only aggression as the latter is prohibited in by UN Charter. Therefore, for the purposes of this thesis, two notions are used to disclose "peaceful purposes" – firstly, non-military – meaning certain territory is demilitarised and any weaponization or military manoeuvres are prohibited, and, secondly – non-aggressive – meaning that military activities in the territory are not prohibited, unless they constitute an act of aggression which is prohibited by the UN Charter legal regime. The analysis of "peaceful purposes" notion under ISL is provided and compared with other legal regimes further.

One of the major pre-treaty ISL sources which "significantly advanced"[141] the ISL, is a unanimously approved 1962 UNGA resolution called "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" (hereinafter – 1962 Outer Space Principles Declaration).[142] Its preamble in two instances emphasized the common interest of all mankind to explore and use outer space for peaceful purposes. The 4th principle of the 1962 Outer Space Principles Declaration requires the activities of states in the exploration and use of outer space to be carried on in accordance with international law, including the UN Charter, in the interest of maintaining international peace and security. The peaceful purposes notion, as well as other principles established in the 1962 Outer Space Principles Declaration, eventually found their place in the OST. The OST preamble emphasizes "<…> the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes" and the desire "<…>to contribute to broad international co-operation in the scientific as well as the legal aspects of the exploration and use of outer space for

141 James Simsarian, "Outer Space Co-Operation in the United Nations in 1963," *American Journal of International Law* 58, no. 3 (1964): 717–23.

142 General Assembly resolution 1962(XVIII), *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, A/RES/1962(XVIII), (13 December 1963), available at: https://undocs.org/en/a/res/1962(XVIII).

peaceful purposes." Similarly, Article III requires the parties to "carry on activities in the exploration and use of outer space <…> in accordance with international law <…> in the interest of maintaining international peace and security and promoting international co-operation and understanding."[143] On the other hand, Article IV explicitly prohibits the use of weapons of mass destruction in outer space and military activities in celestial bodies.[144] The terminology of Article IV led to different understanding of the required conduct in outer space. According to the first interpretation, outer space and celestial bodies may only be used for peaceful purposes and Article IV only provides specific examples of non-peaceful use of outer space. In other words, outer space should be demilitarized and used only for non-military purposes.[145] Another, less strict interpretation, explains "peaceful-purposes" as being "non-aggressive" meaning that as long as military activities in outer space are not aggressive, they are allowed. In other words, Article IV identifies specific prohibitive military activities in space, meaning all other military activities in outer space are allowed.

In the mid-1950s, the emerging ballistic missile threat from Soviet Union encouraged United States to call for complete ban of militarization of outer space. However, in less than one year, after the 1957 launch of Sputnik I, the anticipated availability of US military reconnaissance satellites triggered a shift in United States position that outer space should be used for peaceful rather than non-military purposes.[146] The vagueness of the peaceful purposes clause allowed the two major space powers, the United States and Soviet Union, sign the OST. Eventually, two different opinions on what peaceful purpose mean appeared. United States interpreted military use legitimate as long as it was defensive in nature while Soviet Union held the view that any military use is by definition not peaceful and not allowed.[147]

The mentioned Article III of the OST requires state parties to conduct their activities in accordance with international law, including the UN Charter. This rule preemptively

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143 OST Art. III.

144 OST Art. IV reads as follows:

"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.

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."

145 Vermeer, Arjen. "A Legal Exploration of Force Application in Outer Space." *Military Law & Law of War Review* 46, no. 2 (2007): 299–340, 310.

146 Christopher M. Petras, "The Debate over the Weaponization of Space: A Military-Legal Conspectus." *Annals of Air and Space Law* 28 (2003): 171–218, 172.

147 France Von der Dunk and Fabio Tronchetti. *Handbook of Space Law*. Northampton: Edward Elgar Publishing, Inc., 2015, 314.

solves the question of conflict with the UN Charter and, along the line of Article 103 of the UN Charter[148], it is undoubtful that aggression and any other prohibited forms of state conduct (such as the use of disproportionate measures when implementing the right to self-defense) could ever be justified in outer space. On the other hand, it should also be taken into account that prohibition of aggression under UN Charter regime does not automatically expose the meaning of "peaceful purposes". UN Charter *jus ad bello* regime, for instance, does not prohibit nuclear weapon deployment in outer space nor requires complete demilitarization of celestial bodies as OST does. Hence, although UN Charter use of force limits apply to outer space, they do not effectively clarify the "peaceful purposes" notion. What is only evident, is that the use of force in accordance with UN Charter (such as the use of force in self-defence) is not prohibited under ISL regime.

Other instruments of international law use similar wording as well. The notion of peaceful purposes is repeated in several articles of the Statute of the International Atomic Energy Agency (hereinafter – Statute of IAEA).[149] The repetitive phrase "to further any military purpose"[150] leads to understanding, that notion peaceful purposes in the Statute of IAEA refers to non-military, because the term "peaceful" is used in circumscribing the types of activities that IAEA support, while the term "military" is used to specify the activities that IAEA seeks to prevent.[151]

The preamble of the 1959 Antarctic Treaty[152] states that it is the interest of mankind that Antarctica continued forever and shall be used "exclusively for peaceful purposes". Article 1 of 1959 Antarctic Treaty stipulates that "Antarctica shall be used for peaceful purposes only" and lists prohibitions among which rests "any measures of a military nature, such as establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapons." It is clearly seen from the text that treaty of Antarctica prohibits not only the aggressive, but all military action (except for scientific) in that Continent. Therefore, the "peaceful-purposes" in the Antarctic Treaty means "non-military".

Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (hereinafter – ENMOD Convention)[153] requires en-

148 Article 103 reads as follows: "In the event of a conflict between the obligations of the Members of the United Nations under the present Charter and their obligations under any other international agreement, their obligations under the present Charter shall prevail."

149 Statute of the International Atomic Energy Agency, 29 July 1957, 276 UNTS 3, arts. II, IIIA(1-5), XIF(4), XIIA(1), XIIA(5), XIIA(6), XIIB.

150 For example, Article II reads as follows: "The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."

151 Paul C. Szasz, *The Law and Practices of the International Atomic Energy Agency* (Vienna: IAEA, 1970), 352, https://www-pub.iaea.org/MTCD/Publications/PDF/Pub250Main.pdf.

152 The Antarctic Treaty, Dec1, 1959, 402 U.N.T.S. 71, Preamble and Art. 1.

153 Convention on the prohibition of military or any other hostile use of environmental modification techniques, Dec. 10, 1976, 1108 UNTS 151 (hereinafter – ENMOD Convention), Art. 3.

vironmental modification techniques to be used only for peaceful purposes and not to engage in military or any other hostile use of it having widespread, long-lasting, or severe effects to any State. The notion "peaceful purposes" in the ENMOD Convention read in conjunction with "military or any other hostile use" let us conclude that only hostile military use of environmental modification techniques is prohibited and only such which would cause widespread, long-lasting or sever effects, but not all the military use. Therefore, the notion of "peaceful purposes" in ENMOD Convention means "non-aggressive" rather than "non-military."

Article 88 of the United Nations Convention on the Law of the Sea (hereinafter – UNCLOS)[154] states that "[t]he high seas shall be reserved for peaceful purposes". By the time of drafting the UNCLOS, international instruments regulating maritime warfare were already present. Although the term "high seas" is not used in the 1907 Hague Convention (X) for the Adaptation to Maritime Warfare of the Principles of the Geneva Convention, it did ruled principles of maritime warfare at any waters no matter how far away from the shores of States.[155] GCII imposed obligations upon maritime belligerents to respect and protect, collect, treat humanly and otherwise care for wounded, sick or shipwrecked in sea battles.[156] 1977 API was already opened for signatures by the time of the UNCLOS Conference III. API included rules of conduct in maritime hostilities.[157] During the UNCLOS negotiations, there was no common understanding that peaceful purposes meant the total demilitarization of the sea or merely some limits of military action. The majority of states were concerned with limiting the military uses of the sea, but not with their total prohibition.[158] In practice, high seas were used for various military purposes, such as the testing of nuclear weapons, transportation of military equipment, ships are used as launch-pads for military jets, and many more. "Peaceful purposes" clause in UNCLOS does not exclude military uses and hence means "non-aggressive" rather than "non-military."

If we took a glance of 1888 Constantinople Convention Respecting the Free Navigation of the Suez Maritime Canal (hereinafter – Suez Canal Convention), it would be seen that although it does not use the peaceful purposes notion, however, Suez Canal Convention prohibits any interference of free use of Suez Canal in time of war and any hostile acts in it.[159] The Parties to Suez Canal Convention may not to interfere in any way with the security of that Canal and its branches, the working of which obstruction. Accordingly, Suez Canal may not be a legitimate theatre of war and may not be used neither for aggressive, nor any other military purposes.

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154 United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 UNTS 3.

155 Convention (X) for the Adaptation to Maritime Warfare of the Principles of the Geneva Convention. The Hague, 18 October 1907.

156 GCII, Arts. 12, 18, 21, 22, 27, 28.

157 See API Arts. 22-23.

158 Katharina Bork et al., "The Legal Regulation of Floats and Gliders—In Quest of a New Regime?," *Ocean Development & International Law* 39 (2008): 298–328, 304-305.

159 Convention respecting the Free Navigation of the Suez Maritime Canal, Constantinople, 29 October 1888.

The above listed selective examples show that the notion of peaceful purposes may in some cases prohibit any military acts while in others – only non-aggressive. Therefore, to better understand the content of the discussed notion, the source needs to be examined on the case-by-case basis. Article IV of the OST lists military activities which are prohibited in celestial bodies: the establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres.[160] It is worth mentioning, that there is no absolute prohibition of weapons in outer space, even weapons of mass destruction. Article IV prohibits the full orbital cycle of a weapon of mass destruction, however, inter-continental ballistic missiles with nuclear warheads are free to use orbits and descent before they reach the ascent point. Only a permanent placement of weapons of mass destruction in orbits, on celestial bodies or anywhere else in outer space is prohibited. Moreover, the OST does not explicitly prohibit any other weapons in outer space which are not weapons of mass destruction. It means that weaponization of outer space, be it orbital or celestial, is not absolutely prohibited. It should be emphasized that these prohibitions apply to celestial bodies, not the rest of outer space or artificial bodies. In case the delegates of states involved in drafting OST were willing to prohibit all military activities in outer space, one may question the reasoning of including these specific prohibitions because even if they had not been mentioned, the OST would still prohibit them under the peaceful purposes notion as it is portrayed by the first interpretation discussed earlier.

The expert group of Tallinn Manual discussed the concept of peaceful purposes in the context of the use of cyber means in outer space. They argued that from the beginning of the space age, outer space has been used for military purposes such as reconnaissance and surveillance. Moreover, a great deal of space technology has had a "dual-nature" in the sense that civilian space capabilities often stem from military space developments and many civilian space applications, such as commercial satellite imagery, are used for military purposes. Therefore, the expert group rejected the premise that any purported limitation on the use of outer space to peaceful purposes should be interpreted as "non-military."[161] According to Petras, the omission to conjunct "outer space" with the "peaceful-purposes" notion was intentional, because some states were willing to carry out reconnaissance and other military activities in outer

160 The full text of the article is as follows:

"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.

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 maneuvers 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."

161 Michael N. Schmitt, ed., *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017), 275.

space. Therefore, according to Petras, the concept of "peaceful-purposes" primarily means non-aggressive.[162] Schmitt makes a relatively sharp claim about the notion of peaceful purposes in UNCLOS and compares it to OST: "any assertion that this provision banned military activities at sea would be absurd. Why the OST would be interpreted differently is unclear at best."[163] Other scholars uphold the peaceful purposes as non-aggressive interpretation.[164]

State practice shows the constant use of outer space technologies for military purposes which already indicates that space faring nations do not consider peaceful purposes as complete demilitarisation of outer space. Moreover, while OST specifically indicates the prohibited military conduct (in celestial bodies and orbits as far as weapons of mass destruction are concerned) it would make no sense if specifically unidentified and unprohibited conduct would actually be prohibited (leaving aside state prohibited conduct under other international instruments). Put it other way, since OST specifically indicates prohibited military activities, it may be said that all other military activities in outer space are permissible. For instance, the specific prohibition of building military bases on the Moon does not mean that this prohibition also applies to orbits. Contrary, building military bases in orbits would be as legitimate as having and using reconnaissance satellites. Therefore, in view of the Author, the concept of "peaceful-purposes" in OST today primarily means non-aggressive and, accordingly, the use of force in outer space is not prohibited to the extent that it does not contradict UN Charter and other international instruments, including OST itself.

1.6. Operation of ISL treaties during armed conflicts

In 2011, an authoritative body examining and explaining international law – International Law Commission (hereinafter – ILC) – submitted a report to United Nations General Assembly (hereinafter – UNGA) containing draft articles on the effects of armed conflicts on treaties and their commentary (hereinafter – Armed Conflict Effects Report).[165] In the Armed Conflict Effects Report ILC proposed a general rule that "[t]he existence of an armed conflict does not *ipso facto* terminate or suspend the operation of treaties" neither in international, nor non-international armed conflict situation.[166] If a treaty itself contained provision of operation in situations of armed

162 Petras, 189.

163 Schmitt, "International Law and Military Operations in Space", 102.

164 See Dale Stephens, "International Legal Implications of Military Space Operations", 94 *International Law Studies* 75 (2018), 80, Melissa De Zwart, "Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. William H. Boothby (Cambridge: Cambridge University Press, 2019), 337–58, 354.

165 International Law Commission, Report of the Commission to the General Assembly on the work of its sixty-third session, *Yearbook of the International Law Commission,* Vol. II, Pt. 2, 2011, (hereinafter – Armed Conflict Effects Report),106-130.

166 Armed Conflict Effects Report, 107 (Article 3).

conflict, those provisions should apply.[167] None of the Articles in major treaties governing outer space legal regime[168] include an armed conflict clause. Contrary, they include clauses of the use of certain weapons, clauses reflecting UN Charter limits (see "1.5. The notion of "peaceful purposes" in OST") which indicate that the armed conflict in outer space is not prohibited by ISL *per se.* There are no indications that treaties regulating outer space stop operating in the outbreak of hostilities. In cases of susceptible treaty termination, withdrawal, or suspension in the event of an armed conflict, the rules of international law on treaty interpretation should be applied.[169] ILC also listed factors which should be taken into consideration in the aforementioned situation. Article 6 of the Armed Conflict Effects Report reads as follows:

"In order to ascertain whether a treaty is susceptible to termination, withdrawal or suspension in the event of an armed conflict, regard shall be had to all relevant factors, including: (a) the nature of the treaty, in particular its subject matter, its object and purpose, its content and the number of parties to the treaty; and (b) the characteristics of the armed conflict, such as its territorial extent, its scale and intensity, its duration and, in the case of non-international armed conflict, also the degree of outside involvement."

ILC did not find it "practicable" to suggest specific guidelines on how to assess the nature, subject matter, object and purpose, and content of a treaty in the context of an armed conflict. However, in this framework, it needs to be emphasized that the "peaceful purposes" notion, as already indicated, does not prevent, but rather limit certain military conduct in outer space. In other words, the nature of the OST (especially taken into account the provisions related to the use of weapons of mass destruction and military use of celestial bodies) does not indicate that its provisions' application should cease as soon as the armed force is used. Contrary, it may be argued to a certain point that the OST supplements the *jus ad bellum* and *jus in bello* regimes indicating specific prohibited military practice leaving the rest of it unprohibited, or to be more precise, regulated by other instruments of international law.

ILC suggested a list of categories of treaties which exhibit a "high likelihood" of continued applicability during armed conflict.[170] These international instruments involve treaties on the law of armed conflict; treaties related to land and maritime boundaries; multilateral law-making treaties; treaties on international criminal justice; treaties of friendship, commerce and navigation and agreements concerning private rights; treaties for the international protection of human rights; treaties relating to the international protection of the environment; treaties relating to international watercourses and related installations and facilities; treaties relating to aquifers and related

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167 Armed Conflict Effects Report, 107, Art. 4.

168 Namely, Outer Space Treaty, Rescue Agreement; Liability Convention; Registration Convention; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Jul. 11, 1984, 1363 U.N.T.S. 3 (hereinafter – Moon Agreement).

169 Armed Conflict Effects Report, 107, Art. 5.

170 Armed Conflict Effects Report, 108; 113.

installations and facilities; treaties which are constituent instruments of international organizations; treaties relating to the international settlement of disputes by peaceful means, including resort to conciliation, mediation, arbitration and judicial settlement; treaties relating to diplomatic and consular relations.[171] Outer space international legal regime, at least to the extent as it does not cover private commerce and navigation and protection of the environment, does not fall into that list. However, it should be borne in mind that the list is indicative, broad and although drafted by an authoritative body, is not binding. Due to these reasons, it may not be (yet) concluded that outer space treaties cease to be applied during an armed conflict.

It is important to mention, that Article 3 of the OST emphasizes importance of application of international law, including the UN Charter, when using outer space in the interest of maintaining international peace and security. Although the mentioning of the UN Charter clearly indicates applicability of *jus ad bellum* in outer space, however, the requirement to pursue international law when using space could also be understood as requirement to follow *jus in bello* alongside the *jus ad bellum* requirements. An important rule was suggested by ILC in the Armed Conflict Effect Report concerning *jus ad bello* and other international treaties. It reads as follows: "A State exercising its inherent right of individual or collective self-defence in accordance with the Charter of the United Nations is entitled to suspend in whole or in part the operation of a treaty to which it is a party insofar as that operation is incompatible with the exercise of that right."[172] Some authors have indicated that this acknowledgement of the right of suspension of treaties is unclear and suggested that suspension of OST is unlikely since it would be inconsistent "with any number of weapons treaties that operate in a time of armed conflict relating, *inter alia,* to chemical and biological weapons."[173] Notably, prohibitions establishing widely accepted rules, such as prohibition of the use of chemical or bacteriological weapons, are considered by some authors as *de facto jus cogens* and, therefore, this argument pertaining to the weapons of mass destruction is not entirely convincing.[174] Moreover, restriction of the use of certain weapons falls entirely under the spectrum of *jus in bello* and it was previously argued that legality or illegality of the use of armed force does not condition legal requirements of conduct in hostilities. It should also be noted that the afore mentioned rule should not be understood as expected practice of states, but rather the exception from the general rule that treaties do not automatically cease in case of an armed conflict. Only if the circumstances of the use of force do not permit application of a certain obligations listed in treaties or other agreements (e.g., bilateral agreements between parties to the conflict on military

171 Armed Conflict Effects Report, 108.

172 Armed Conflict Effects Report, Art. 14.

173 Stephens, Dale. "The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and the Outer Space Legal Regime." *International Law Studies* 94, no. 75 (2018): 75–101.

174 Charles Hyun, "The Prohibition of Chemical Weapons: Moving Toward Jus Cogens Status." *Southern California Law Review* 88, no. 6 (2015), 1465.

cooperation; agreements concerning free movement of citizen between the borders of parties to the conflict; governmental contracts of military equipment purchase, etc.), treaties might cease to operate. Implementation of the right to self-defence or Security Council resolution on the use of force does not *ipso facto* cease international obligations.

1.7. Potential conflict of laws between ISL and IHL

International law continuously develops in response to new emerging practices to cover unregulated forms of technological or functional advancement. While there is no hierarchy between international legal rules and there is no major international treaty which could harmonize all the follow-up treaties, the emerging new laws often appear to have their own specific principles without due regard to already existing principles of other branches of international law. International Law Commission described this process as "fragmentation of international law" and indicated such specialized law-making (as what once was "general international law" which became specialist systems as "trade law", "human rights law", "international refugee law", etc.) being a serious problem – "such specialized law-making and institution-building tends to take place with relative ignorance of legislative and institutional activities in the adjoining fields and of the general principles and practices of international law. The result is conflicts between rules or rule-systems, deviating institutional practices and, possibly, the loss of an overall perspective on the law."[175] International space law developed in the second half of the twentieth century separately from the already century-old law of the armed conflict and as it is seen further, in many instances these two branches of international law took contradictory paths resulting in multiple conflicting laws in force.

IHL and ISL have multiple cross-points where the conflict between two rules may not be solved simply by identifying the specificity of the law as was the case in ICJ with the right to life (see "1.8. Relative resolution mechanisms of conflict of laws under international law"). It is also important to notice, that in contrast to other international treaties, such as Convention on International Civil Aviation (hereinafter – Chicago Convention),[176] neither OST, nor other ISL instruments do not specify their applicability during the armed conflict. Therefore, as it has been already established, ISL treaties continue to operate during armed conflict and we may not draw strict division between application IHL and ISL treaties merely for the reason of the presence of an

175 *Fragmentation of International Law: Difficulties Arising From the Diversification and Expansion of International Law.* Report of the Study Group of the International Law Commission. Finalized by Martti Koskenniemi. A/CN.4/L.682, 13 April 2006, (ILC Fragmentation Report) p. 12.

176 Article 89 of Chicago Convention, named "War and emergency conditions", reads as follows: "In case of war, the provisions of this Convention shall not affect the freedom of action of any of the contracting States affected, whether as belligerents or as neutrals. The same principle shall apply in the case of any contracting State which declares a state of national emergency and notifies the fact to the Council." Convention on International Civil Aviation ("Chicago Convention"), Dec. 7, 1944, 15 U.N.T.S. 295, (hereinafter – Chicago Convention).

armed conflict. Having this in mind, the Author deems necessary to illustrate the potential conflicts of laws between ISL and IHL treaties.

Article V of the OST requires the states to regard astronauts as envoys of mankind. If one state makes a discovery that any phenomena in outer space might constitute danger to the life or health of astronauts, it shall immediately inform state parties to the OST or UN Secretary-General. Other obligations, including the giving of all possible assistance to the astronaut in the event of accident, indicates that the complexity and importance of the function and mission astronauts have, make them the object of specific protection and care by all involved states. On the other hand, Article 3 of the 1949 Geneva convention relative to the treatment of prisoners of war (hereinafter – GCIII),[177] lists multiple categories of persons who shall be accorded prisoner of war status in the event of capture during armed conflict. As a rule (with few exceptions), only combatants shall be granted prisoner of war status upon their capture. According to Article 3 of GCIII, combatants are primarily those, who are members of the armed forces of the party to the armed conflict. In case an astronaut is a member of armed forces, he or she is immediately vested combatant status despite his or her function in the military (artillery fighter, driver, lawyer – but with few exceptions such as medical or religious personnel). That means that any military astronaut according to the strict reading of GCIII is a legitimate target under the rules of armed conflict, however, at the same time has been granted special protection under OST being an envoy of mankind. More to add, even if the astronaut is not legally considered as a combatant but merely civilian, under the international armed conflict legal regime he or she might as well loose protective civilian status (certain conditions being met[178]) if he or she directly participates in hostilities. For instance, a civilian astronaut providing the necessary intelligence for successful implementation of the operation or even repairing a satellite which is used for military purposes would in most cases loose protective status.

According to Article V of the OST, astronauts shall be rendered all possible assistance in the event of accident, distress or emergency landing on the territory of another State. When astronauts make such a landing, they shall be safely and promptly returned to the State of registry of their space vehicle.[179] According to Article 4 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of

177 GCIII, Art. 118.

178 In 2009, ICRC published a study on the notion of direct participation in hostilities and clarified three accumulative elements making a civilian direct participant in hostilities: threshold of harm, direct causation and belligerent nexus. Although certain examples in the study were criticized, the three mentioned conditions are widely accepted to be an effective tool to determine the legality of targeting civilians. According to the study, a civilian gathering military intelligence or operating a vehicle during the mission is a direct participant. Hence, an astronaut providing any information to the military helping to target other satellite or any other military objective might loose protective status under IHL. Nils Melzer, *Interpretive Guidance on the Notion of Direct Participation in Hostilities* (Geneva: ICRC, 2009), 46-64.

179 Outer Space Treaty, Art. 5.

Objects Launched into Outer Space (hereinafter – Astronaut Rescue Agreement)[180], "[i]f, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party or have been found on the high seas or in any other place not under the jurisdiction of any State, they shall be safely and promptly returned to representatives of the launching authority." IHL similarly protects persons in the event of accident prohibiting attacks on descending parachutists from an aircraft in distress.[181] However, upon reaching the ground a person who has parachuted from an aircraft in distress shall be given an opportunity to surrender before being made the object of attack, unless it is apparent that he or she is engaging in a hostile act.[182] According Article 118 of the GCIII, "[p]risoners of war shall be released and repatriated without delay after the cessation of active hostilities." As seen from the API and GCIII texts, persons facing accident of an aircraft[183] are somewhat protected, however differences appear considering the timing of repatriation. In case of IHL, obligation to repatriate prisoner of war may be invoked after cessation of hostilities, the opposite to what is required under ISL regime. If an astronaut fulfilled the criteria of a combatant[184] in the armed conflict, should he or she be released immediately after capture in distress, or should a detaining power wait for the hostilities to end? One rule is specific due to the extreme circumstances of astronauts' operational area and mission making them "envoys of mankind", another specific rule underlines the right of the Party to the conflict to detain captured combatants and exclude them from further military operations.[185]

Agreement on the rescue of astronauts, the return of astronauts and the return of objects launched into outer space (hereinafter – Rescue Agreement) also requires a state which found a space object (or its component) belonging to other state to return it to the country of jurisdiction upon its request.[186] IHL does not require the return of a war prize to the opponent – adversely, IHL allows attacking military objectives of the

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180 Agreement on the rescue of astronauts, the return of astronauts and the return of objects launched into outer space, Apr. 22, 1968, 672 UNTS 119 (hereinafter – Rescue Agreement).

181 1977 API, Art. 42(1).

182 1977 API, Art. 42(2).

183 It should be stressed that an aircraft and a spacecraft are different legal categories and obligations related to the latter may only be transposed by analogy which might be questioned.

184 The so called "classical" criteria of a combatant are listed in GCIII art. 4. Combatants are either members of governmental armed forces or "Members of other militias and members of other volunteer corps, including those of organized resistance movements, belonging to a Party to the conflict and operating in or outside their own territory, even if this territory is occupied, provided that such militias or volunteer corps, including such organized resistance movements, fulfil the following conditions:
(a) that of being commanded by a person responsible for his subordinates;
(b) that of having a fixed distinctive sign recognizable at a distance;
(c) that of carrying arms openly;
(d) that of conducting their operations in accordance with the laws and customs of war."

185 Fleck, 372.

186 Rescue Agreement, art. 5.

opponent by damaging, neutralizing, or capturing them.[187] In practice, the captured military objectives are often used against the opponent.

According to Article IV of the OST, it is prohibited to build military installations and make military manoeuvres in celestial bodies. IHL does not prohibit these activities, however, gives a recommendation to avoid (to the maximum extent feasible) locating military objectives within or near densely populated areas[188] – the opposite to celestial bodies.

According to Article V of the OST, astronauts shall render all possible assistance to the astronauts of other States, however, IHL legitimises the use of force against military objects of another State in accordance with laws and customs of war. In contrast to ISL, a combatant-astronaut of one state would not be expected to assist enemy combatant under IHL.

According to Article IX of the OST, if a state has reason to believe that its activity would cause potentially harmful interference with activities of other States, it shall undertake appropriate international consultations with relative states. None of IHL rules oblige one party to the conflict consult another, at least directly. In contrast, IHL permits ruses of war – acts which are intended to mislead an adversary to act recklessly without prior warning.[189] On the other hand, under IAP Article 57(2)(c), the effective advance warning shall be given of attacks which may affect the civilian population. However, this requirement is not binding if the circumstances do not permit (such as the lack of time or if the warning which could undermine the success of the attack) and is only binding if civilian population (not military objectives or individual civilians) may be negatively affected by the attack. Therefore, under IHL, neither advance warning shall be given nor consultations taken prior to attacking a satellite or an astronaut being a legitimate military target if such an attack would not pose threat to the civilian population.

According to Convention on Registration of Objects Launched into Outer Space (hereinafter – Registration Convention)[190] it is required of States to register the space object being launched into outer space and among other information, provide the general function of the launched space object. IHL neither requires such warning prior to attacking a military object (except in relatively rare cases of a potential breach of proportionality under the requirements of military precautions in attacks[191]), nor register or indicate the function of the used weapon. On the opposite, a party to the conflict,

187 1977 IAP, art. 52(2).

188 Article 58(b) of API reads as follows: "The Parties to the conflict shall, to the maximum extent feasible: <…> (b) avoid locating military objectives within or near densely populated areas;".

189 API, Art. 37(2).

190 Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 1023 U.N.T.S. 15, Art. 2, 4.

191 IAP, Art. 57(c).

according to the permissible use of ruses of war,[192] may intentionally provide misleading information. Therefore, under the ISL regime states are required to provide information about the function of the launched object while under the IHL, launching a secret space weapon (as long as it does not constitute a prohibited act of perfidy) would not require any prior provision of information about the launched object.

Convention on International Liability for Damage Cause by Space Objects (hereinafter – Liability Convention) establishes the so-called principle of absolute liability requiring the launching state to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.[193] IHL allows attacking enemy's military objectives and does not require paying compensations for damage made to the military force of the opponent, especially bearing in mind the fact that IHL allows proportionate collateral damage. Compensations under IHL are allowed only in cases when hostilities are commenced in the breach of the law.[194]

As it has been already indicated that ISL treaties do not cease to be applied during an armed conflict, the given examples and scenarios, fortunately yet hypothetical, raise an important question: how do conflicting rules from different bodies of law which are both specific in nature interact with each other and which rule should be primarily applied?

1.8. Relative resolution mechanisms of conflict of laws under international law

There are multiple options under international law that help to resolve the question of rule priority and every option could be presented in extreme detail to include mechanisms described in treaties, state and court practice. However, the Author believes that the thorough analysis of these concepts is not solely the object of this thesis or in some cases, evidently inapplicable.[195] Therefore, these concepts are presented only briefly and only to the extent that is necessary to come up with the conclusion which of the two, ISL or IHL, should be given priority during armed conflict.

Article 53 of VCLT states, that a treaty is void if, at the time of its conclusion, it

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192 IAP, Art. 37(2) reads: "2. Ruses of war are not prohibited. Such ruses are acts which are intended to mislead an adversary or to induce him to act recklessly but which infringe no rule of international law applicable in armed conflict and which are not perfidious because they do not invite the confidence of an adversary with respect to protection under that law. The following are examples of such ruses: the use of camouflage, decoys, mock operations and misinformation."

193 Convention on the international liability for damage caused by space objects, Sept 1, 1972, 961 U.N.T.S. 187, Art. 2.

194 1977 IAP, art. 91 reads as follows: "A Party to the conflict which violates the provisions of the Conventions or of this Protocol shall, if the case demands, be liable to pay compensation. It shall be responsible for all acts committed by persons forming part of its armed forces."

195 For instance, the rule laid down in Article 31(3) of VCLT establishing a well-known principle *lex posterior derogat legi priori* (a later law repeals an earlier law) applies only in cases of same subject matter. IHL and ISL have different subject matters and, in view of the Author, this rule may not apply.

conflicts with a peremptory norm of general international law (*jus cogens*).[196] Moreover, Article 64 of the VCLT indicates, that if a new peremptory norm emerges, any existing treaty which is in conflict with that newly formed norm becomes void and terminates.[197] These rules in VCLT establish a so-called "vertical hierarchy"[198] of norms of international law where one rule is given priority over the other because it is accepted and recognized by the international community as a norm from which no derogation is permitted. The examples of *jus cogens* rules (inconclusively) include unlawful use of force, genocide, slave trading and piracy[199] and other international crimes such as a war crimes of torture.[200] Neither of the mentioned *jus cogens* rules may appear to be in conflict between IHL and outer space law regime. For example, IHL does not solve questions of aggression while the OST – with a specific principle of non-aggressive use of outer space – relatively does. The OST does not regulate war crimes peculiarities, while IHL does. Therefore, while both regimes (IHL and ISL) encompass *jus cogens* rules, there are no indications that a *jus cogens* rule in one regime might be in conflict with a rule in the other regime. That precludes application of "vertical hierarchy" conflict of laws solution mechanism.

The other specific normative conflict resolution mechanism offers a "horizontal" settlement of conflicts between international laws. According to the well-known principle *lex specialis derogat legi generali*, a more detailed law derogating from more general law should take priority over a general law.[201] As was already mentioned, it is often the case with separate branches of international law that the "specificity" of one over the other is hard to determine because they regulate different fields. International Law Commission in its report on fragmentation of international law (hereinafter – ILC fragmentation report) defined a special law as "the rule with a more precisely delimited scope of application".[202] It has even admitted that the same normative conflict might have different solutions dependently from the substantive coverage of a provision or the number of subjects which are bound by a relative rule (e.g. a territorially limited general regime and a universal treaty on some specific subject).[203] ILC indicated that *lex specialis* technique is widely accepted because a special rule is "more to the point"

196 VCLT, Art. 53.

197 VCLT Art. 64.

198 Author is of the view, that "vertical hierarchy" as a term is misleading, since international law is decentralized and there is no legal hierarchy between rules of international law. However, it should be admitted that the relationship between *jus cogens* rules and rules conflicting these peremptory norms may remind to a certain point the legal hierarchy of laws established in national legal systems.

199 Malcolm N. Shaw, *International Law* (Cambridge: Cambridge University Press, 2010), 126.

200 See M. Cherif Bassiouni, "International Crimes: Jus Cogens and Obligatio Erga Omnes," Law and Contemporary Probleems 59, no. 4 (Autumn 1996): 63-74.

201 Shaw, *International Law,* 66.

202 ILC Fragmentation Report, 35.

203 ILC Fragmentation Report, 35.

than a general rule and it regulates the matter more effectively than general rules.[204] Special rules have greater clarity and definiteness, they take into account particular circumstances and are more binding than general rules which may stay in the background and be applied only rarely.[205] *Lex specialis* is also more useful because it may better define what the parties may have willed.[206] It needs to be stressed out that *lex specialis* does not figure in VCLT as a treaty interpretation technique, despite the fact that it did find some support in drafting procedures of VCLT.[207] ILC identified the two types of *lex specialis,* one considered as an application of a general standard in a given circumstance, the other – a modification, overruling or a setting aside of the general standard.[208] ILC concluded that *lex specialis* is a "generally accepted technique of interpretation and conflict resolution"[209] and that "whenever two or more norms deal with the same subject matter, priority should be given to the norm that is more specific".[210]

It is important to add that ILC holds both, IHL and ISL as special in the sense of international law being a "self-contained regime". ILC stated: "fields such as "human rights law", "WTO law", "European law/EU law", "humanitarian law", "space law", among others, are often identified as "special" in the sense that rules of general international law are assumed to be modified or even excluded in their administration."[211]

It may be said that *lex specialis* rule may be identified only in comparison to other conflicting rule and that the specificity of the rule derives from the delimitation of the "scope of application", but not necessarily its detail and specificity of the matter. In other words, two conflicting rules might both seem to be specific, if they regulate different specific matters, however, in such a case, attention should be given whether any of the specific rules are deemed to be applied in "more" specific circumstances. And therefore, while searching for the specificity in both rules on the same subject matter, circumstances of application rather than the details of the rule itself should primarily be taken into account.

1.9. *Lex specialis* and IHL

Lex specialis has been applied multiple times by different international bodies in different contexts. ISL has never been subjected to analysis of *lex specialis* due to natural reasons – the standards of ISL require high cooperation of states and space operations themselves require high readiness to avoid any possible costly and deadly

204 ILC Fragmentation Report, 36.

205 ILC Fragmentation Report, 37.

206 ILC Fragmentation Report, 37.

207 ILC Fragmentation Report, 39.

208 ILC Fragmentation Report, 49.

209 ILC Fragmentation Report, Conclusions, 5th conclusion.

210 ILC Fragmentation Report, Conclusions, 5th conclusion.

211 ILC Fragmentation Report, Para. 129.

accidents or other reasons a dispute between states might be brought to the court. In contrast, IHL has already been subjected to the *lex specialis* dispute, however, only in context of IHRL. Despite the fact the there is no case law solving outer space law and IHL prioritization issues, elaboration of IHL and IHRL conflict resolution might serve as a tool to apply analogy method and crystalize relationship between IHL and international space law.

In 1996 ICJ passed the advisory opinion in Nuclear weapons case (hereinafter – ICJ Nuclear Weapons Opinion) where the Court (in)famously admitted it could not reach a definite conclusion on the legality of the use of nuclear weapons in an extreme circumstance of self-defence, in which the very survival of the population of the State would be at stake.[212] This opinion accelerated debates among international lawyers.[213] While the task of ICJ was to give opinion on legality of the threat or use of nuclear weapons, the court had to solve numerous other questions to come up with the opinion. One of them – the interplay between IHRL and IHL. The question raised by proponents of illegality of the use of nuclear weapons was that the use of such weapons would violate the right to life enshrined in Article 6 of the International Covenant on Civil and Political rights (hereinafter – ICCPR).[214] In reply, others argued that ICCPR did not mention any war weapons and questions related to unlawful loss of life in hostilities were governed not by ICCPR, but by the law applicable in armed conflict.[215] ICJ did not fully support any of the opinions. It ruled out that the "test of what is an arbitrary deprivation of life <…> falls to be determined by the applicable *lex specialis*, namely, the law applicable in armed conflict which is designed to regulate conduct of hostilities." ICJ emphasized that ICCPR does not cease to be applied during armed conflict, however some provisions of it may be derogated from if they meet the requirements of the *lex specialis* test. The Court held that the law of armed conflict is designed to regulate conduct in hostilities and is *lex specialis* in view of IHRL. Therefore, the legality of deprivation of life during armed conflict should be evaluated in terms of the law of armed conflict, not the standards of human rights.[216]

In 2004, ICJ contemplated the question of legal consequences arising from the construction of the wall being built by Israel in the occupied Palestinian territories (hereinafter – ICJ Wall Opinion).[217] The Court once again indicated that the protec-

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212 ICJ Nuclear weapons opinion, para. 97.

213 *See* Kramer, Ronald C., and D. Kauzlarich. "Nuclear Weapons, International Law, and the Normalization of State Crime." In *State Crime: Current Perspectives*, 68–93. London: Rutgers University Press, 2011. P. 68; Anastassov, A. "Are Nuclear Weapons Illegal? The Role of Public International Law and the International Court of Justice." *Journal of Conflict & Security Law* 15, no. 1 (2010): 65–87.

214 ICJ Nuclear weapons opinion, para 24.

215 ICJ Nuclear weapons opinion, para 24.

216 ICJ Nuclear weapons opinion, para. 25.

217 Legal Concequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion (9 July, 2004) (hereinafter - ICJ Wall Opinion), https://www.icj-cij.org/public/files/case-related/131/131-20040709-ADV-01-00-EN.pdf

tion offered by human rights conventions does not cease in case of armed conflict.[218] However, differently from the ICJ Nuclear Weapons Opinion, it concluded that as "regards the relationship between international humanitarian law and human rights law, there are thus three possible situations: some rights may be exclusively matters of international humanitarian law; others may be exclusively matters of human rights law; yet others may be matters of both these branches of international law."[219] The Court decided to apply both branches of international law, namely IHRL and, as *lex specialis,* IHL. Decision to apply both, *lex generalis* IHRL and *lex specialis* IHL, has been criticized not to meet the standard of *lex specialis,* since principle of *lex specialis* explicitly states that special rule takes precedence over a general rule, and not to simply choose dependently from the context which one of the two rules would be applied.[220] It has been claimed that ICJ in ICJ Wall Opinion rather applied a "systemic integration" interpretation method under VCLT Article 31(3) than simply "*lex specialis*" doctrine.[221] Todeschini defined "systemic integration" method as follows: "when more than one norm is applicable to a certain case, the interpreter should construe all these rules in accordance with a sense of coherence and meaningfulness expressed by international law as a system, in a way that allows, as far as possible, to view norms pertaining to different regimes as a single set of compatible obligations".[222]

In 2005 ICJ case Concerning Armed Activities on the Territory of the Congo the Court reiterated the ICJ Wall Opinion and without any comprehensive arguments and analysis of the relationship of IHL and IHRL listed both, IHL and IHRL treaties applicable in the given case.[223]

Lex specialis has been dealt by international military tribunals as well. ICTY in 2008 trial judgement in *Boškovski* case stated that in situations falling short of armed conflict, a State has a right to use force to maintain security, uphold law and order, but IHRL restricts such usage to what is no more than absolutely necessary and proportionate to certain objectives. However, according to the Court, "when a situation reaches the level of armed conflict, the question what constitutes an arbitrary deprivation of life is interpreted according to the standards of international humanitarian law,

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218 ICJ Wall Opinion, para. 106.

219 ICJ Wall Opinion, para. 106.

220 Alonso Gurmendi, "The Soleimani Case and the Last Nail in the Lex Specialis Coffin," Opinio Juris, 2020, http://opiniojuris.org/2020/01/13/the-soleimani-case-and-the-last-nail-in-the-lex-specialis-coffin/.

221 Vito Todeschini, "The ICCPR in Armed Conflict: An Appraisal of the Human Rights Committee's Engagement with International Humanitarian Law," *Nordic Journal of Human Rights* 35, no. 3 (2017): 203–19, 2.

222 Todeschini, 6.

223 Case Concerning Armed Ctivities on the Territory of the Congo, Judgment (19 December, 2005) (hereinafter – ICJ Congo), https://www.icj-cij.org/public/files/case-related/116/116-20051219-JUD-01-00-EN.pdf.

where a different proportionality test applies."[224] It is evident that ICTY took a 1996 ICJ's approach when IHL is given priority over IHRL during armed conflict.

The relatively brief jurisprudence of ICJ, sometimes called a "confusion"[225] and even more narrow findings of ICTY, unfortunately, do not allow to make a conclusion that *lex specialis* maxim is uniform and commonly applied in conflict cases of IHL and IHRL. Both courts claimed that IHRL and IHL apply during armed conflict, however, ICJ's jurisprudence seems to have shifted from strictly *lex specialis* IHL approach to rather concise systemic integration of both branches of public international law. Despite the lack of absolute uniformity in this context, it may be said that neither of decisions explicitly stated that all of the IHRL cease to be applied during armed conflict. It may also be analogically concluded that the presence of armed conflict does not automatically stop operation of other laws than IHL, including ISL.

As was already mentioned, ILC recognized *lex specialis* as "useful" and "accepted" technique of treaty interpretation. However, in the aftermath of 1996 ICJ Nuclear Weapons Opinion, especially after 2001 terrorist attacks in USA and the rise of legal issues brought by "4th generation wars"[226], the strict *lex specialis* technique became less convenient, acknowledged to be too restrictive for application of human rights standards. For instance, Sassoli and Olson gave an example of a guerrilla leader shopping in a supermarket in the government-controlled capital. On the one hand, the authorities according to standards of IHL would be permitted to shoot to kill the fighter due to continuous combat function,[227] while IHRL would clearly say that such a person should be arrested and a graduated use of force must be employed.[228] Sassoli and Olson argued that it is impossible to provide a "one size fits all" answer and it should be borne in mind that the standard of *lex specialis* set in 1996 by ICJ has to be read in context of the legality of the use of a certain weapon.[229] Sassoli and Olson offered to view IHRL as *lex specialis* over IHL in cases of killings where government controls the territory[230] and that application of *lex specialis* technique should be flexible and depend on case-by-case basis.[231]

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224 ICTY, *Prosecutor v. Boškovski*, IT-04-82-T, 10 July 2008, para. 178.

225 Bill Bowring, "Fragmentation, Lex Specialis and the Tensions in the Jurisprudence of the European Court of Human Rights," *Journal of Conflict and Security Law* 14, no. 3 (2010): P. 486.

226 *See* Qureshi Waseem Ahmad, "Fourth- and Fifth-Generation Warfare: Technology and Perceptions," *SAN DIEGO INT'L L.J.* 21 (2019): 187–215.

227 Continuous combat function emphasizes the permanent status of a combatant as long as he or she is continuously a member of an armed group. Even if a member of armed forces is off-duty, that does not mean that he or she retains civilian status because his or her combatant status is determined not by a factual activities, but membership in the organization which is party to the armed conflict.

228 Marco Sassòli and Laura M. Olson, "The Relationship between International Humanitarian and Human Rights Law Where It Matters: Admissible Killing and Internment of Fighters in Non-International Armed Conflicts," *International Review of the Red Cross* 90, no. 871 (2008): P. 613.

229 Sassòli Olson, 613.

230 Sassòli Olson, 614.

231 Sassòli Olson, 615.

Garraway came up with similar conclusion application of IHL or IHRL depend on status of an armed conflict and authority established in the territory. For instance, if there is an international armed conflict, IHL "has the lead and human rights law applies to the extent that it is not incompatible. Where there is no armed conflict, human rights law obviously prevails as international humanitarian law has no place. <…> In such [occupation] cases, where authority has been established, it may be considered that human rights principles on the use of force should take priority as it is in effect a law enforcement situation. However, in territory where such authority has not been established and cannot therefore be exercised, international humanitarian law principles would prevail" (parenthesis added by the Author).[232]

Other commentators in legal literature criticized the lack of clarity of the principle of *lex specialis*, since international law lacks hierarchy of norms as opposed to national law. Lindroos argues that "[t]here is no centralised legislator in the international legal system. Norms are created by the subjects of international law themselves in a variety of fora, many of which are disconnected and independent from each other, creating a system different from the more coherent domestic legal order. Where national law is strongly based on hierarchy and institutional structures, the international normative order may be viewed from the perspective of bilateral state relations, something that does not easily lend itself to the establishment of systemic relations between norms. This lack of systemic relations and a centralised law-making process are essential differences between the domestic and the international legal order."[233]

Lex specialis technique is criticized to be vague, since it is often hard or even impossible to determine if rule is *lex specialis* or *lex generalis.* Prud'homme argues that it "is unclear how the *lex specialis* principle could assist in articulating the interplay between international humanitarian law and some economic, social and cultural rights. For example, this theory raises questions related to the obligations concerning the right to health during occupation, wherein although international humanitarian law contains health related obligations, it is in international human rights law that the detailed understanding of the right to health is to be found. <…> Probably because of the difficulty in discerning the *lex specialis* and the *lex generalis*, this method also appears of limited use when dealing with issues concerning detention during armed conflicts."[234]

Some authors even suggested to discard *lex specialis* technique when describing relationship between IHL and IHRL. Milanovic described *lex specialis* as "misleading,

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232 Charles Garraway, "'To Kill or Not to Kill?'-Dilemmas on the Use of Force," *Journal of Conflict and Security Law* 14, no. 3 (2010): 509.

233 Anja Lindroos, "Addressing Norm Conflicts in a Fragmented Legal System: The Doctrine of Lex Specialis," *Nordic Journal of International Law* 74, no. 1 (2005): 28.

234 Nancie Prud'homme, "Lex Specialis: Oversimplifying a More Complex and Multifaceted Relationship," *Isr. L. REV* 40 (2007): 382.

vague in meaning, and of little practical use in application."[235] Instead, Milanovic argues that IHL treaties and human rights treaties can be reconciled and interpreted harmoniously and only when it fails, a political choice will have to be made as to which of the conflicting norms should be given priority over the other.[236]

On the other hand, proponents of *lex specialis* technique argue that humanitarian law is very much based on reciprocity between parties to the conflict and denial of *lex specialis* granting priority to human rights law would eventually cause inequality of parties to the armed conflict, especially in non-international armed conflicts. Zemach indicated that "the law of war as *lex specialis* is an essential guarantee of the principle of equality in the application of the law of war. A fundamental principle of the law of war is the equal application of its rules (i.e., *jus in bello*) to all parties to an armed conflict. This principle applies to both international and non-international armed conflicts. <…> Such equality between state and non-state actors does not exist, however, in the context of international human rights law. The obligations contained in this body of law are binding on governments only."

The concerns raised by scholars indicate, that *lex specialis* technique is not universal or applicable in every context where IHL oppose a certain rule of human rights. This technique lost its uniformity mostly due to the problem of targeted killings during non-international armed conflicts and mostly only in context of conflict with IHRL. However, it should be noted, that this technique has not been negated or recognized as inapplicable – it still prevails as one of treaty interpretation techniques which still may find its place in certain cases of IHL relationship with other branches of international law. Despite the fruitful scholarly discussions on IHL and human rights law, although dynamic, but existing jurisprudence of international courts on the matter, ISL and IHL relationship has not attained so much of the attention.

1.10. Models of conflict resolution between ISL and IHL proposed by publicists

Discussions on superiority of the two conflicting laws of ISL and IHL have been raised only by a few of scholars (presented further). Neither of them gave a definite answer to the question, which of the two branches of international law should prevail during armed conflict. Indeed, the lack of state practice in the field and specifics of conflicting rules would not allow to construct a universal model applicable in every situation of conflict. However, the given ideas by scholars are presented to contemplate the question further.

While discussing *jus in bello* relationship with outer space law regime, Dunk applies a method of analogy of how *jus ad bellum* regime in UN Charter copes with

235 Marko Milanovic, "A Norm Conflict Perspective on the Relationship between International Humanitarian Law and Human Rights Law," *Journal of Conflict & Security Law* 14, no. 3 (2009): 482.

236 Ibid.

other conflicting regimes.[237] He reiterates the UN Charter's Article 103 which deems to solve conflicts of UN Charter and other international treaty rules that UN Member State is bound by. Dunk correctly argues that *jus ad bellum* is "viewed as essentially a detailed elaboration of the Charter's legal regime." Or, put another way, if there was a conflict between two *jus ad bellum* rules in international treaties, the one set in UN Charter should be primarily applied. However, Dunk further argues that since "*jus ad bellum* and the *jus in bello* are increasingly seen as two overlapping parts of a continuum rather than two separate bodies of law, at least the broader principles enshrined in the *jus in bello* <…> would override potentially contradictory provisions of space law, inasmuch as they represented detailed elaborations of the Charter's principles." Despite the fact the Dunk further argues that Article 103 "does not by itself allow prioritization on the applicability of many elements of the law of armed conflict and outer space law", the former argument that due to interrelation between *jus ad bellum* and *jus in bello* broader principles (such as distinction between combatants and non-combatants) should overrule specific rules of international space law, seems unreasonable. Despite the fact *jus ad bellum* and *jus in bello* are somewhat underpinned, they are still different branches of international law and, most importantly, do not impose any restrictions on one another. As UN Charter regime on the use of force is concerned, it does not cover in any direct way the rules of *jus in bello* and therefore it may not be argued that the similarity of these two branches lead to application of Article 103 analogically to *jus in bello* situations as in case of *jus ad bellum*. UN Charter does not solve the question of superiority (or to be more precise – conflict of laws) between *jus in bello* and ISL. None of the conflicting situations mentioned in the previous sub-chapter may be solved using Article 103 of the UN Charter. This is because UN Charter does not directly regulate *jus in bello* regime. Moreover, none of IHL rules have similar clause prioritising them over other treaties. Analogy to Article 103 in this case seems unreasonable.

Dunk further offers an analytical tool which stems from the basic understanding that the state parties to a treaty ultimately determine what substantive rights and obligations they have given their consent by way of ratification or accession. According to Article 31 of VCLT, treaty interpretation requires that the terms of the treaty were seen in their context and in the light of its object and purpose to determine if it is established that the parties so intended. VCLT also allows the supplementary means of interpretation to confirm the meaning when the interpretation leads to result which is manifestly absurd or unreasonable (Article 32). Dunk reiterates the fundamental principle that any law has to be at least potentially effective, and law that would be ineffective should be appropriately reinterpreted. He gives an example of requirement to treat astronauts as envoys of mankind and that the following of this requirement in context of enemy astronauts would be absurd or unreasonable, especially if they displayed characteristics of military astronauts or engaged in military operations. In that case, Dunk argues that obligations of Article V of the OST and the Rescue Agreement

237 Frans G. von der Dunk, "Armed Conflicts in Outer Space: Which Law Applies?"

should bow to the applicable rules of the law of armed conflict on the treatment of enemy combatants and enemy citizens.[238]

Dunk's offered interpretative tool actually solves some of the issues concerning conflicting regimes, but not all of them. For example, the prohibition to use celestial bodies for military purposes would not seem "absurd and unreasonable" even in context of an armed conflict. And the main problem with finding out what is "absurd or unreasonable" is that such a determination in most cases be made on subjective, not objective grounds. One might argue that building a military base on the Moon would be perfectly legal, since otherwise it would be "absurd or unreasonable" for such prohibition to exist during armed conflict, others might say, that it is not "absurd or unreasonable", since military bases might be built not necessarily in celestial bodies. Cases of possible two-fold interpretation should be avoided to the maximum extent possible, especially in context of military operations where military engagement decisions should be made only after appropriate legal considerations.

Stephens argues that OST would continue to apply during armed conflict, however, its application would be tempered by the nature of the armed conflict and resulting normative reconciliation with IHL and other applicable legal regimes.[239] In certain cases OST would be accorded priority, in others, IHL provisions would govern conduct in space. According to Stephens, determination of which law should be prioritized should be a matter of interpretation.[240] He applies Dworkin's concept of "law as integrity" – an interpretation technique which relies upon reason and a sense of moral judgement.[241] Dworkin's approach applied, it is necessary to find unifying themes of the two regimes. Stephens finds "humanitarianism" as a "unifying theme" in outer space and IHL regimes. He then comes up with the conclusion that in any case of the conflict between IHL and outer space legal regime, any notion which offers a "greater outcome of human well-being" should be preferred.[242] Since both legal regimes seek to humanize state conduct in difficult conditions, it may be added, that according to the Stephens' proposed model, less humanitarian notion should be overruled by a more humanitarian one.

In Author's view, Stephen's proposed model is reasonable but has certain drawbacks.

Firstly, the interpretation which law would prioritize "humanitarianism" over necessities in war would at least partly contradict the purpose of IHL. Even though IHL seeks to humanize armed conflicts, it does not seek to eliminate the deaths, injuries, and destruction from the armed conflict. IHL's purpose is not the import of "humanitarianism" in war and it may not be a "unifying theme" as Stephens claims. Actually,

238 Dunk, 219.

239 Dale Stephens, "International Legal Implications of Military Space Operations", 94 *International Law Studies* 75 (2018), 83.

240 Stephens, 84.

241 Stephens, 95.

242 Stephens, 96.

IHL strikes the balance between military necessity and humanity and defines conditions under which the militarily necessary, although destructive, action is legal. Opting a "more humanitarian" rule over the "less humanitarian" one could disbalance IHL making a conflict in outer space in some cases almost impossible to conduct and, hence, IHL inapplicable. Stephens' model applied, an astronaut should not be made an object of attack in all cases, since a "more humanitarian" notion of astronaut assistance under ISL regime would be prioritized over the "less humanitarian" permission under IHL to attack military objectives. A state which would not be allowed to attack an enemy astronaut would be bound to face negative consequences that the "ISL protected" military astronaut could cause even if these consequences themselves were far from being humanitarian (e.g., astronaut-combatant destructed a satellite and the loss of its signal caused civilian aircraft crash).

Secondly, in some cases, it may not be evident enough which rule is "more humanitarian". For instance, what is more humanitarian – sending home an enemy combatant-astronaut which has fallen into the hands of the enemy due to distress or capturing such person and granting prisoner of war status? In the first case of an astronaut-combatant return, the possibility of him/her to re-join space forces to continue to be part of war atrocities would be left open. That means, that the release of an astronaut might further contribute to the non-humanitarian action of combat. In the second case – a person would have his/her right of free movement restricted – a situation lacking the expected "humanitarianism" under IHRL standards. In most cases, the weighting of different humanitarian values is practically impossible, especially when both conflicting laws have "humanitarian" purpose. The burden placed on the shoulders of commanders who make targeting decisions (or rather their legal advisors) would most certainly be too heavy, because they would not be certain of which law to apply. As Garraway correctly noted, "[i]f we expect our soldiers to conduct operations, we must provide a legitimate means by which they can do so."[243]

More to add, the standards set by international criminal law, especially related with *mens rea* element in superior responsibility, in most cases would leave the commanders legally irresponsible for their actions, because the required *mens rea* in some cases could not be established as a consequence of undescriptive and confusing law requiring subjective evaluation of what is more "humanitarian". Lastly, Dworkin's "law as integrity" has been criticized by multiple philosophers of law[244] and his theory might not be taken for granted as being the only interpretative tool. Stephen's solution could be handful where both conflicting rules have similar weight and no other normative conflict resolution mechanism might be applied in practice.

Both proposed ISL and IHL conflict resolution mechanisms are handful, especially in cases of stable environment and when there is time to draw arguments and pass

243 Garraway, 509.

244 *See* Julie Dickson, "Interpretation and Coherence in Legal Reasoning", in *The Stanford Encyclopedia of Philosophy (Winter 2016 Edition),* ed. Edward N. Zalta, Stanford: The Metaphysics Research Lab Center for the Study of Language and Information, 2016.

judgements. From the perspective of military conduct and individual responsibility, unfortunately, these models raise questions of their practical implementation. Without having any interest to rebut the valuable work of Dunk and Stephens, the Author is keen on looking for a more practical instrument to offer.

1.11. A proposal for potential normative IHL and ISL conflict resolution

The brief analysis of interplay between IHL and human rights law shows *lex specialis* technique, although being criticized, remains one of the major tools to solve conflict of laws. Each case in the court would most certainly have different circumstances and countless methods and techniques to come up with the judgement. Interpretation of law would even loose its purpose if there was a universal conflict resolution method having no disadvantages. *Lex specialis* has been described as inflexible, unclear, not systemic, vague, indeterminate, limited, misleading, unpractical, unusable and on the other hand – a precise, effective, useful, widely and generally accepted technique. One thing may be said with confidence – it is still an operative technique and in certain circumstances might be helpful, in others – not.

As seen from the previous chapter – *lex specialis* technique has been criticized only in context of relationship between human rights law and IHL. It is probably because these two branches of international law are very different in nature. Solis uniquely summarized their relationship in one paragraph (abbreviates human rights law – HRL; law of armed conflict – LOAC) : "[t]here are significant differences between HRL and LOAC. HRL is premised on the principle that citizens hold individual rights that their state is bound to respect; LOAC imposes obligations on the individual. HRL largely consists of general principles; LOAC is a series of specific provisions. HRL enunciates state responsibilities; LOAC specifies individual responsibilities as well as state responsibilities. In HRL, rights are given to all; LOAC links many of its protections to nationality or specific statuses, such as combatants. HRL allows for state derogation; LOAC does not."[245]

If we want to establish certain model of IHL's application in certain theatre of war, we must look at existing views of how IHL interacts with other legal regimes, such as in sea, air or cyber operations.

The San Remo Manual on International Law Applicable to Armed Conflicts at Sea is silent on the interplay between IHL and international law of seas. Despite the fruitful debate on human rights law, the question of IHL relationship with international law of seas has rarely been raised. Haines even stated that in context of naval warfare, the "element of the *lex specialis* has been largely overlooked".[246] UNCLOS has multiple areas of

245 Solis, *The Law of Armed Conflict. International Humanitarian Law in War* (Cambridge: Cambridge University Press, 2010), 26.

246 Steven Haines, "War at Sea: 19th Century Laws for 21st Century Wars?," 2017, https://gala.gre.ac.uk/id/eprint/17548/7/17548 HAINES_War_at_Sea_2017.pdf.

military-like conduct regulation. For example, it establishes the right of innocent passage or transit of warships and submarines (Articles 29-32), immunity of warships in high seas (Article 95), piracy by a warship (Article 102), right of hot pursuit by warship or military aircraft (Article 111). Green argued that if "it is suggested that UNCLOS constitutes *lex generalis* it must be pointed out that it cannot invalidate any rights arising under *lex specialis* such as the law of armed conflict, unless there is incontrovertible evidence in the text that it was intended to override such *lex specialis.*"[247] Green further argues that "[t]o the extent that UNCLOS may itself be considered as *lex specialis* it clearly cannot invalidate any principle of another *lex specialis*, especially when so much of the latter arises from custom and therefore is not affected by any application of the principle that later potentially inconsistent law invalidates any earlier principles. <…> The fact that new classifications of sea areas have been introduced by the Convention and have become accepted into international law does not mean that the traditional rights and duties of belligerents or neutrals have been automatically amended or terminated. To suggest otherwise is reminiscent of the rejected contention that the development of new weapons, be they the crossbow, tanks, aircraft or others, means that their use is unregulated. It merely means that, to the extent possible, the existing law is <…> extended and adapted to cover these developments."[248] In view of Green, in most cases IHL is *lex specialis* and UNCLOS regime – *lex generalis.* And even in some cases UNCLOS regime might serve as *lex specialis,* it may not override the rules of warfare.

HPCR Manual on International Law Applicable to Air and Missile Warfare[249] did not solve the question of interplay between international air law and IHL, although there was an indication related to the human rights law. It was specifically indicated in this manual that *lex specialis* discussion related to human rights law was held during drafting process and experts did not reach any agreement. Most experts of this manual believed that the question of human rights had "only minimal bearing on air and missile warfare in international armed conflicts because the law of armed conflict is *lex specialis*".[250] On the other hand, Chicago Convention provides a useful conflict resolution tool in Article 89 allowing states to freely apply IHL in case of war.[251]

Tallin Manual elaborated *lex specialis* principle in cyber operation context in more detail than other manuals. In context of state responsibility, experts of Tallin Manual agreed that "although treaties and customary international law may specifically

247 Leslie Green, *The Contemporary Law of Armed Conflict*, 2nd ed. (Manchester: Manchester University Press, 2000), 165.

248 Green, 165.

249 Claude Bruderlein and Et. Al., *Commentary on the HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge: Program on Humanitarian Policy and Conflict Research, 2010).

250 Ibid. P. 16.

251 Article 89 of Chicago Convention, named "War and emergency conditions", reads as follows: "In case of war, the provisions of this Convention shall not affect the freedom of action of any of the contracting States affected, whether as belligerents or as neutrals. The same principle shall apply in the case of any contracting State which declares a state of national emergency and notifies the fact to the Council."

address State responsibility in particular situations, such rules constitute *lex specialis* and therefore only displace general rules of State responsibility that are in direct conflict therewith. <..> The law of State responsibility applies objectively to facts as they exist or do not exist. For instance, the cyber operations of a non-State actor are attributable to a State if the State factually exercises 'effective control' over that specific conduct of the non-State actor".[252] In context of human rights law, experts agreed the law of armed conflict and international human rights law apply to cyber-related activities in the context of an armed conflict, subject to the application of the principle of *lex specialis*".[253] An example was given that although human rights treaty provisions prohibiting arbitrary deprivation of life are non-derogable, whether a cyber-attack during armed conflict violates that prohibition is determined by reference to the *lex specialis* international humanitarian law regarding the conduct of hostilities.[254] Tallinn Manual gave specific attention to space law due to importance of outer space with regard to cyber activities. Experts took the view that to (footnotes omitted) "the extent space law applies to a particular circumstance involving cyber operations, it may, as *lex specialis*, prevail over contrary rules found elsewhere in this Manual." It needs to be stressed, that this view is based (as indicated in the footnote) on ILC fragmentation report where ILC has stated that space law is *lex specialis*.[255] However, in the same paragraph, ILC mentioned IHL also as an example of *lex specialis.* And hence, we may not conclude that military cyber operations falling under *jus in bello* regime are necessarily considered as *lex generalis*. On the other hand, Tallinn Manual experts evidently considered requirements of satellite signal jamming during armed conflict to fall under *lex specialis* law of armed conflict, if such jamming was likely to cause incidental loss of civilian lives or harm to civilian property.[256]

In context of different internationally regulated spaces where war may be possibly waged, publicists commonly consider IHL as *lex specialis.* This technique is supported in the latest war manual related to cyber warfare which has been published in 2017, way after the topic of IHL and human rights law *lex specialis* issue has been presented, discussed and even arguments exhausted.[257] It shows that *lex specialis* technique is still useful and capable of solving conflicts of rules related to modern warfare. Having *lex specialis* as an available technique and ILC's indication that ISL and IHL are both *lex specialis,* we need to come back to the question – when the two branches interact with each other, which law and when is *lex specialis* – IHL or outer space law?

ILC determined the "special" provision as the rule with a more precisely delimited scope of application. In Author's view, the *lex specialis* rule would be the one with a

252 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017), 81.

253 Tallinn Manual, 181.

254 Tallinn Manual.

255 ILC Fragmentation Report, para. 129.

256 Tallinn Manual, 298.

257 See Gurmendi, "The Soleimani Case and the Last Nail in the Lex Specialis Coffin."

more defining and circumstantial approach. For example, if we compare prohibition of military operations in celestial bodies under outer space legal regime with no such prohibition under IHL regime, we would find that such a prohibition would serve as an exception to general IHL regime, because it would have more circumstances of application: it would be applied specifically during the armed conflict in outer space, compared to generally IHL regime having no such prohibition elsewhere. In that case, rules related to regulation of military activities in outer space established by ISL would be *lex specialis* compared to military activities regulated by IHL being *lex generalis.* The more circumstances define application of law, the more it is conditioned, circumstantial and "special." The specificity of IHL application is that it is applied during armed conflicts. The specificity of ISL application – it is generally applied to activities in outer space. ICL admitted that one of the difficulties in the *lex specialis* rule is that it is hard to distinguish between what is "general" and what is "special".[258] A rule is never "general" or "special" in the abstract, but in relation to some other rule.[259] Therefore, strictly speaking, we may not even contemplate whether ISL or IHL is *lex specialis* or *lex generalis,* since the normative context must be taken into account. In other words, only a specific rule of either ISL or IHL may constitute *lex specialis*, but not the branch of law itself. Moreover, such conflict may be subjected to the analysis only when two (or more) conflicting rules discuss the same subject matter.[260]

In context of satellite targeting and *jus in bello* obligations, the subject matter that is common to the potentially conflicting IHL and ISL rules (see "1.7. Potential conflict of laws between ISL and IHL") is state conduct related to the military activities in outer space (or rather against the objects in outer space). All other activities, such as peaceful activities in outer space or military activities on Earth are regulated by either ISL (in first case) or IHL (in the second) and have no potential of the conflict. Hence, freedom of exploration of outer space may be implemented either in peacetime or during an armed conflict, as this rule does not contradict any of IHL's rules. Naturally, any conduct related to the armed conflict which is not regulated by ISL (do not have common subject matter) should be governed by IHL rules, ISL being *lex generalis*, and IHL – *lex specialis.* For example, the protective status of an astronaut under outer space legal regime has fewer defining circumstances then if that astronaut was also a combatant. Under outer space legal regime the defining circumstances of an astronaut would be "a person operating in outer space" while under IHL regime it would be "a person operating in outer space during an armed conflict being a member of armed forces or non-regular state armed group being commanded by a person responsible for his subordinates, having fixed distinctive sign, carrying a weapon openly and conducting operations in accordance with laws and customs of war".[261] So naturally, if an astronaut was a member of armed forces and conducted any activity in outer space – he

258 ILC Fragmentation Report, para. 111.

259 ILC Fragmentation Report, para. 112.

260 ILC Fragmentation Report, para. 116.

261 GCIII, art. 4.

or she would be a combatant subjected to attack during an armed conflict. Following this logic, nether astronauts, nor objects shall be returned to launching states if they constitute combatants or military objectives. Consequently, captured astronaut of the armed forces of the opposing party to the armed conflict should be granted prisoner of war status. Captured ASAT weapon or any other military objective from space of the opposing party to the armed conflict may be kept and no compensation may be legally required.

It should be noted that the attacks in outer space might as well be subjected to the standards of human rights law and discussion of interplay between IHL and human rights law might be brought once again. Therefore, the attack against an astronaut might be limited under human rights law standards. However, it should also be emphasized that it is not subject to this thesis to crystalize the question of superiority between IHL and human rights law or human rights law and international space law.

In conclusion, during an armed conflict, all rules regulating military conduct in outer space under ISL regime should be primarily applied as *lex specialis* or an exception from IHL regime. In all other cases where ISL is silent on the military activities, IHL should prevail as a primary source to conduct hostilities in outer space. However, ISL continues to operate during armed conflict in outer space as long as it does not contradict IHL.

2. TARGETABILITY OF SATELLITES

2.1. General remarks regarding targeting laws

Analysis in the previous chapter showed that the rules of IHL are not geographically limited and the presence of the armed conflict would condition application of targeting rules in outer space equally as those applicable on the ground, sea or in the air. By now, the question satellite targeting legality has only attained justification. Further and major answers need to be searched for. The subsequent analysis of targeting rules scrutinizes satellite targeting question in more detail.

In general, targeting rules embody various steps which need to be taken prior or during the attack. In the very broad sense, these rules cover not only the way in which attacks may be legally waged, but also against what targets they may be directed. For methodological purposes, the Author believes that the best way to present the analysis is to decompose targeting rules and classify them into two groups: rules of the targetability of an object and rules of targeting of an object. In the first case, analysis is focused on objects which are permissible, restricted or prohibited from targeting and in the latter case, the way in which they may or may not be targeted. In other words, this chapter deals with the question "what?" while further chapter with the question "how?"

2.2. Targetability of satellites and the notion of military objective

The only legitimate targets under IHL are military objectives. According to IAP, "[a]ttacks shall be limited strictly to military objectives".[262]

The term "military objective" first appeared in context of air warfare, where the 1923 Hague Rules of Aerial Warfare in Article 24.1 indicated that "[a]n air bombardment is legitimate only when directed against a military objective, i.e. an objective whereof the total or partial destruction would constitute an obvious military advantage for the belligerent."[263] After more than 50 years with the adoption of IAP in 1977, the general concept of military objective given in the definition – that the destruction of such an objective should constitute an evident military advantage – remained. However, the newly constructed definition in the IAP attained more details and, eventually, was made more objective.

Prior to analysing definition of military objective, certain comments contextualising targetability of satellites need to be made. First of all, targetability connotes to the distinction between legitimate and illegitimate targets. Article 48 of the IAP reads as follows:

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262 1977 IAP, Art. 52(2).

263 "Rules Concerning the Control of Wireless Telegraphy in Time of War and Air Warfare. Drafted by a Commission of Jurists at the Hague, December 1922 - February 1923" (1923), https://ihl-databases.icrc.org/ihl/INTRO/275 (last visited May 05, 2021).

"In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives."[264]

This rule, enshrined in the Article 48 named "Basic rule" embodies one of the core principles of IHL – principle of distinction and is considered to reflect customary international law.[265] ICJ characterized it as "cardinal principal" constituting the "fabric of humanitarian law."[266] No reservations to it have yet been made by any of the parties to the IAP.

Principle of distinction, as recorded in IAP Article 48, implies a two-fold obligation upon parties to the conflict. Firstly, parties to the conflict should wisely choose targets, distinct them from civilian ones and wage attacks only against military objectives. Secondly, it requires parties to the conflict distinct themselves so as the opponent was able to follow the former duty to target only military objectives. What constitutes a "military objective" is disclosed in Article 52, which was primarily constructed to define civilian objects and envisage their protection. When the ICRC was called upon to draw the draft of the IAP in early 1970s, the humanitarian organization faced a dilemma whether to define civilian objects which may not be attacked or, contrary, list military objectives subjected to attacks.[267] Naturally, the moral question rose whether a humanitarian treaty should describe which objects may lawfully be attacked. After many discussions it has been chosen to define in detail military objectives, because it was believed that no definition would jeopardise effective protection of civilian population.[268]

Article 52(1) of IAP states that civilian objects are all objects which are not military objectives. Article 52(2) of IAP draws a definition of military objectives which are "<…> 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". Oeter noted, that definition of military advantage laid down in Article 52(2) "<…> is an attempt to codify the customary requirement of distinction and to transform it into a specific rule of combat <…>. The attempt to define exactly what constitutes a military objective is an essential step in making the principle of distinction operative".[269] Since it may be said that principle of distinction is an essential characteristic enabling

264 API, Art. 48

265 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.* (Cambridge: Cambridge University Press, 2005), 25.

266 ICJ Nuclear Weapons Opinion, para. 78.

267 Claud Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Geneva: Martinus Nijhoff Publishers, 1987), 633.

268 Ibid. 635.

269 Stefan Oeter, "Methods and Means of Combat," in *The Handbook of International Humanitarian Law*, ed. Dieter Fleck, 2nd ed. (Oxford: Oxford University Press, 2008), 175, 177.

practical implementation of IHL, it is important to analyse this definition in detail and uncover various particularities.

According to the definition of military objective, a target may constitute a military objective only insofar as two cumulative requirements, sometimes called as "a two-pronged test"[270], are met:

1. the nature, location, purpose, or use of these objects make effective contribution to military action, and
2. their destruction, capture or neutralization, offers a definite military advantage.

One side of the test, namely, effective contribution, is an objective element of the definition determined by facts and the other, namely, definite military advantage, is a subjective element determined by evaluation of military advantage. As seen further, some notions in the effective contribution element are debatable and what constitutes effective contribution to military effort may in itself be subjective. Put it other way, probably any test offered by laws or publicists interpreting those laws or a test which requires interpretation of facts is at some point subjective. However, the Author describes the first element as objective merely for the purposes of distinguishing it from the second element and because it requires fact-finding while the second element – does not.

What constitutes the nature, location, purpose or use which make effective contribution or what is considered a definite military advantage is not defined elsewhere in IAP, nor any other international treaty. Therefore, additional sources such as international court decisions, state practice, *opinio juris* or opinions of qualified publicists need to be used to disclose the meaning of military objective and answer the question if satellites constitute that legal notion.

2.2.1. Objective element of military objective

Military objectives, as said before, qualify as such only in so far as they may be attributed with certain characteristics and a certain degree of military value. The effective contribution to military action may alternatively be reached by the nature, location, purpose, or use of an object. That means that when estimating and qualifying whether an object is a legitimate military target, the four characteristics need to be put into the evaluation process.

First of all, it needs to be stressed that contribution to military action is required to be effective. An object which makes no contribution or its contribution to military action is vague or not evident would fail to meet the requirements of legitimate military objective. The non-functional and non-repairable satellite, even having a primary military function (such as military reconnaissance satellites) would make no contribution to military action and, hence, would not constitute a military objective. Similarly, satellites which are hardly ever used by the military, such as Meteosat-8 (satellite operated by European Organisation for the Exploitation of Meteorological

270 Ian Henderson, *The Contemporary Law of Targeting* (Leiden: Martinus Nijhoff Publishers, 2009), 51.

Satellites which primary functions are the assessment of significance of aerosols for global radiative forcing and magnitude of the solar absorption at the surface and the trace of species and pollutants[271]) or Sentinel-3A (ESA's satellite which provides data on sea-surface temperature and map the extent and topography of ice, among other purposes)[272] are not military objectives, because they make no effective contribution to military action. Satellites transmitting broadband tv signals and entertaining soldiers in their remote military bases are as well an example of non-military objective, since entertainment rather contributes to the emotional wellbeing of soldiers, but not military action *per se*.

Military objectives make effective contribution to military action, but not military effort or the military in general.[273] The military may benefit from a wide range of services and objects, many times the status of which is purely civilian. For instance, should a bank account of a military unit responsible for procurement of military goods make the bank itself a military objective? Or should a private satellite manufacturing company paying significant portion of national taxes to the government which are allocated to the military spending in the aftermath constitute military objective? Some states claim that it should. The United States Commander's Handbook on the Law of Naval Operations (hereinafter – United States Commander's Handbook) defines a military object as follows: "[a]n object is a valid military objective if by its nature (e.g., combat ships and aircraft), location (e.g., bridge over enemy supply route), use (e.g., school building being used as an enemy headquarters), or purpose (e.g., a civilian airport that is built with a longer than required runway so it can be used for military airlift in time of emergency) it makes an effective contribution to the enemy's war fighting/war sustaining effort and its total or partial destruction, capture, or neutralization, in the circumstance at the time, offers a definite military advantage."[274] The major difference between this definition and the one laid down in the IAP Art. 52(2) is the use of the words "war fighting/war sustaining effort" in the former, and "effective contribution to military action" in the latter. In general, the phrase "war sustaining effort" includes any activities which help to sustain the military (and war, accordingly) itself, including economic activities which generate income to be used in the future to sustain the military. Therefore, taken previously given example about private entity manufacturing satellites into account, such company and its infrastructure could be targetable despite the nature of its product.

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271 EUMETSAT, "Meteosat-9 Delivers the Operational Indian Ocean Data Coverage (IODC) Service from Its Position at 45.5°E," accessed July 20, 2022, https://www.eumetsat.int/indian-ocean-data-coverage-iodc.

272 Rosamund Pearce, "Interactive: How Satellites Are Used to Monitor Climate Change," CarbonBrief, 2016, https://www.carbonbrief.org/interactive-satellites-used-monitor-climate-change/.

273 Yoram Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict* (Cambridge: Cambridge University Press, 2004), 95.

274 US Department of Navy, "The Commander's Handbook on the Law of Naval Operations," US Department of the Navy § (2007), 5-2-5-3.

In Author's view, military objectives should not be qualified as so merely by wealth or economic benefit to the government. Definition provided by the United States Commander's Handbook includes any economic taxable activity generating state funds (which is eventually allocated to the military), because the collected taxes might be viewed as a mean sustaining war effort. Consequently, this would make any object involved in the taxable activity a military objective. The classic example provided in context of war sustaining activity is the destruction of raw cotton during American Civil War. The sale of cotton provided funds for purchasing almost all Confederate arms and ammunition.[275] The raw cotton itself did not contribute to military action, but it did contribute to sustain the war. Such a connection between the export goods and military effort has been criticized to be too remote.[276] A similar example would be fields of opium poppies in Afghanistan being major financial supplier of Taliban in illegal drug trade business.[277]

The San Remo Round Table[278] addressed the issue and considered whether to adopt the formulation of IAP Art. 52(2) or the one set in United States Commander's Handbook. It concluded that the United States Commander's Handbook formulation might justify indiscriminate attacks on entire cities.[279] For this reason, San Remo manual included the exact IAP Art. 52(2) definition of the military objective.[280] Despite the "exaggerated claim"[281] made by the participants of the San Remo Round Table, the definition in United States Commander's Handbook seems to be a too-broad version of IAP Art. 52(2) definition, if not a contradicting one.[282] Other states have explicitly indicated (as a general rule) that they would not treat war sustaining facilities as military objectives. For instance, Royal Australian Air Force Operations Law for RAAF Commanders states that "a mere contribution to a country's economic output is unlikely to be sufficient to meet the criteria required for a military objective."[283] Indeed,

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275 Horace B. Jr. Robertson, "The Principle of the Military Objective in the Law of Armed Conflict," *United States Air Force Academy Journal of Legal Studies* 8 (1997), 46.

276 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 95.

277 Jonathan Landay, "Profits and Poppy: Afghanistan's Illegal Drug Trade a Boon for Taliban," Reuters, accessed August 19, 2021, https://www.reuters.com/world/asia-pacific/profits-poppy-afghanistans-illegal-drug-trade-boon-taliban-2021-08-16/.

278 Series of meetings of experts contributing the San Remo Manual on International Law Applicable to Armed Conflicts at sea. See the list of meetings in HIIHL, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, ed. Louise Doswald-Beck (Cambridge: Cambridge University Press, 1995), 45.

279 Louise Doswald-Beck, "The San Remo Manual on International Law Applicable to Armed Conflicts at Sea," *The American Journal of International Law* 89, no. 1 (1995): 199.

280 HIIHL, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*. 117.

281 Robertson, "The Principle of the Military Objective in the Law of Armed Conflict", 50.

282 It should be noted that UNITED STATES is not Party the IAP and the use of an expanded definition in the Commander's Manual is not necessarily a discrepancy of UNITED STATES international obligations.

283 Royal Australian Air Force, "Operations Law for RAAF Commanders" (2004), 65, https://usnwc.libguides.com/ld.php?content_id=2998112.

the Author agrees that the inclusion of war sustaining activities would open door for almost unlimited legal qualification of objects enabling any of them to be targeted. No other *opinio juris* has been found to uphold United States' position.

If indeed the relationship between the war sustaining effort and effective contribution is indirect and too remote, does that mean a military objective may contribute effectively to military action only directly?

It is noted in the authoritative Bothe's IAP Commentary that the effective contribution to military action does not require a direct connection with combat operation compared to such requirement set in Art. 51(3) with respect to civilian persons who lose their immunity from attack only while they take direct part in hostilities. Thus, according to authors of Bothe's IAP Commentary, a civilian object may become a military objective and thereby lose its immunity from deliberate attack through the use which is only indirectly related to combat action, but which nevertheless provides an effective contribution to the military phase of the enemy's overall war effort.[284] It needs to be stressed, that the Bothe's IAP Commentary does not indicate in any way the legitimacy of attacking merely war sustaining objects, but rather suggests that a military objective is not necessarily rendered to be such by its effective contribution to a specific military operation, but rather by its overall effective contribution to combat action.

This approach has been transposed into, for example, Australian military manual.[285] In contrast, Norwegian Manual on the Law of Armed Conflict (hereinafter – Norwegian Manual) stipulates that the "<…> military advantage one expects to obtain may include not only the immediate benefit from the attack but also the cumulative benefit to the overall operation of which the attack is a part."[286] In other words, according to Norwegian Manual, every attack should have at least a minimum benefit from a separate military action and not only benefit to the overall contribution to combat action. The authors of Tallinn Manual sought the connection between effective contribution and military action differently from the position of United States. Tallinn Manual expert group argued that the clause (requiring the object to make an effective contribution to military action to qualify as a military objective) "<…> requires that a prospective target contribute to the execution of the enemy's operations or otherwise directly support the military activities of the enemy". The majority of the experts of Tallinn Manual rejected the approach given in the United States Commander's Manual on the ground that the connection between war-sustaining activities and military action is too remote.[287] The experts were of the view, that the notion of military objective

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284 Michael Bothe, Karl Josef Partsch, and Waldemar A. Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*, 2nd ed. (Leiden: Martinus Nijhoff Publishers, 2013), 365-366.

285 Department of Defence of Australia, "OPERATIONS SERIES ADDP 3.14 TARGETING," Pub. L. No. ADDP 3.14, 101 (2009), 3-3, https://usnwc.libguides.com/ld.php?content_id=11727121.

286 Norwegian Ministry of Defence, "Manual of the Law of Armed Conflict" (2018), 39. https://usnwc.libguides.com/ld.php?content_id=47416967.

287 Tallinn Manual, 441.

is limited to those objects that are war-fighting (used in combat) or war-supporting (making an effective contribution to military action).

In Author's view such an approach is not entirely convincing, because the objective element of military objective in IAP Art. 52(2) does not indicate that the military objective should either be used by the military *or* made an effective contribution to military action. The text of IAP Art. 52(2) does not offer any such alternative. It requires that all military objectives made an effective contribution to military action, otherwise an object would not constitute the status of military objective. Moreover, United States position may be criticized on the ground, that IAP specifically requires contribution to be made to military action, but not activities surrounding military action, such as activities which are entirely civilian in nature the profits of which are used to sustain the military. The text of IAP Art. 52(2) neither requires a direct connection between the military objective and its contribution to military action, nor an indirect one. It does require that the military objective contributed to the military action, whether this military action is related to a specific military operation, or multiple different military activities in war in general. It is very important to distinguish military action from other activities, such as economic trade, so that there were no visible loopholes to justify targeting of almost any object.

As it is well known, the manufacturing of satellites and their launch systems is not only an exclusive state domain. Entities owning satellites pay taxes and indirectly support governmental services, including the military. However, that does not mean that the assets of these entities, including satellites themselves, constitute military objectives. Even if all profit made by privately owned satellite services went specifically to the military, the profit was substantial and significant to the success of military operations, that would not make satellites or other infrastructure owned by a private company targetable, as the position of United States would state contra wise. This is because the current IHL regime and *opinio juris* determine the status of an object not by its financial value, but the military one. In that sense, war sustaining economic activity provided by satellite manufacturing companies does not make satellites targetable. What mostly does, is the four characteristics found in the definition of the military objective which are discussed further.

2.2.1.1. General remarks on nature, location, purpose, or use of the military objective

The effective contribution to military action may be attained by the nature, location, purpose, or use of an object. The list of the four attributes is exhaustive. However, according to Henderson, the four words should not be considered as words of limitation but rather as a way of providing a test for determining what is a military objective.[288] If the object somehow did not fall under any of the four notions but did

288 Henderson, *The Contemporary Law of Targeting*, 54.

provide a military advantage there should be no objections to attack such a target.[289] Henderson notes that the true issue is whether an object is making an effective contribution to military action and the fitting of the military objective under the umbrella of nature, location, purpose or use is far less important.[290] Therefore, it does not mean that an object falling under any of notions of nature, location, purpose or use automatically makes an effective contribution to military action and automatically qualifies as military objective. Henderson even says that Article 52(2) of IAP "would be easier to interpret and more logically consistent if the words of 'nature', 'location', 'purpose' or 'use' were deleted."[291] He gives an example of rifles owned by a civilian rifle club which in no way constitute a military objective even though their nature would demand so.

The Author agrees with Henderson that the notion of "effective contribution" is essential and most important element for military objective qualification. However, the Author is also of the view that the cipher used in the Article 52(2) text is well thought out as well as well-constructed and does not leave any visible loopholes. This is because the notions nature, location, purpose or use are so wide that they could encompass any object. As Rogers notes, "the words 'nature', 'location', and 'purpose or use' are sufficiently wide to give the military commander considerable room for manoeuvre <…>."[292] Henderson admits that he "currently cannot see how" an object could not fall under any of the four notions. That makes his concern only theoretical. The Author believes that there are no practical issues related to the use of nature, location, purpose or use in the military objective test because even if any issue had risen, the correct interpretation of nature, location, purpose, or use could solve the problem. For instance, the rifles of civilian rifle club are not military objectives (despite them being military by nature) because they do not belong to the military, they are not used by the military and there is no information that they will be used by the military (see "2.2.1.1. General remarks on nature, location, purpose, or use of the military objective"). That means that they may not make any effective contribution to military action and constitute a legitimate military objective.

To better understand the perspective of interpretating nature, location, purpose, or use of the military objective, a more detailed analysis is provided further.

2.2.1.2. Nature

The nature of a military objective is determined by its intrinsic character.[293] An object must have an inherent attribute which makes an effective contribution to

289 Henderson, *The Contemporary Law of Targeting*, 54.

290 Henderson, *The Contemporary Law of Targeting*, 54.

291 Henderson, *The Contemporary Law of Targeting*, 55.

292 A. P. V. Rogers, *The Law on the Battlefield*, 2nd ed. (Manchester: Manchester University Press, 2004). 67.

293 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, 96.

military action.[294] Usually, military objectives by nature are materiel and buildings that are owned or controlled by the military for the use by the military.[295]

According to the authors of the ICRC IAP Commentary, the nature of an object "comprises all objects directly used by the armed forces: weapons, equipment, transports, fortifications, depots, buildings occupied by armed forces, staff headquarters, communications centres etc."[296] Some authors add arteries of transportation of strategic importance (e.g. highways), navigable rivers and canals (including tunnels and bridges of railways and trunk roads).[297] Some satellites are military objectives by nature. For example, military weather satellites are essential for imagery intelligence (hereinafter – IMINT) satellite support enabling to provide secure and timely meteorological data, including cloud cover information, helping in planning military operations or taking active combat.[298] Since mid-1960's, US Department of Defence initiated a specific space program (the Defense Meteorological Satellite Program, hereinafter – DMSP) to generate terrestrial and space weather data in the visual and infrared spectrum for operational forces.[299] Satellites of DMSP program are able to track environmental features as clouds, bodies of water, snow, fire, and pollution in the visual and infrared spectrum.[300] These satellites are military objectives even if they play no active role in a specific military operation. All military communications satellites are as well military objectives by nature. Military communications satellites receive radio frequency signals from ground transmitters, amplify these signals, and retransmit them to other receivers on land, at sea, or in the air. However, unlike civilian, military communications satellites provide jam-resistant and encrypted information under hostile, possibly wartime, environments. They are designed to operate in hostile electromagnetic or nuclear radiation environments. Angelo notes that the "fate of nations does not normally depend on whether a civilian communications satellite can complete a credit card transaction in a timely manner. But the inability of national leaders to communicate with their strategic nuclear forces during politically tense circumstances could trigger a sequence of irreversible actions that plunge the world into a devastating nuclear war."[301] One of the examples of military communications satellites program is the USA Milstar program. The objective of the Milstar program was to create a global, secure, nuclear-survivable, space-based communication system (considered a top national priority during the Reagan Administration in the 1980s). Milstar was designed to perform all communication processing and network

294 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict.*

295 Henderson, *The Contemporary Law of Targeting,* 54.

296 ICRC IAP Commentary, 636.

297 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, 97.

298 Angelo. 111

299 "Defense Meteorological Satellite Program," Military.com, accessed June 20, 2022, https://www.military.com/equipment/defense-meteorological-satellite-program.

300 Office of Satellite and Product Operations, "Defense Meteorological Satellite Program (DMSP)," accessed June 20, 2022, https://www.ospo.noaa.gov/Operations/DMSP/index.html.

301 Angelo, *Frontiers in Space: Satellites*. 121-122.

routing onboard, thus eliminating the need for vulnerable land-based relay stations and reducing the chances of communications being intercepted on the ground.[302] All Milstar constellation satellites are military objectives by nature.

Despite the unambiguous qualification of nature by the authors of ICRC IAP Commentary, this element is certainly not universally agreed upon. There is a disagreement whether objects by nature constitute an absolute or relative category.[303] In other words, do all objects by their nature constitute a military objective or only those which have the function which make them such? As an example, an old weapon in a museum is evidently of military nature, but does it constitute military objective? Or could the non-functioning military intelligence satellite orbiting the Earth be targeted? The Author is of the view that determination of an objective as military by nature requires an object to be functional, because a permanently non-functional object could not make any (effective) contribution to military action. In that case not only defunct antique weapons, but any other severely damaged (unrepairable) or destroyed military equipment should not qualify for military objective as long as it is not able to make effective contribution to military action. Therefore, the permanently non-functional military intelligence satellite as any other satellite out of currently over 3 000 defunct satellites orbiting the Earth[304] should not constitute a military objective by nature. Even though practically an attack on a defunct satellite would not make great, if any, military sense, but this explanation may prevent the occurrence of unneeded space debris in case an attacking state nevertheless decided to expose or demonstrate its military capabilities or otherwise threaten the opponent.

It should be clarified that permanently non-functional object differs from a damaged object. In the latter case, an object in not used presently, but may be so in the future. A military aircraft in repair is still a military objective by nature. And this is because the status of military objective by nature may not be altered, unless its fundamental character is changed.[305] A defused missile in the space museum exhibition is no longer a military objective, because its destructive character has been so fundamentally changed that it may no longer offer any contribution to the military action. When a satellite completes its mission and there is no more use for it, it enters the process of decommission when control centre sends commands to the satellite to shut down instruments onboard and prepare for decommission.[306] After commands of decom-

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302 US Air Force, "Milstar Satellite Communications System," accessed June 22, 2022, https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104563/milstar-satellite-communications-system/.

303 Yoram Dinstein and Arne Willy Dahl, *Oslo Manual on Select Topics of the Law of Armed Conflict. Rules and Commentary* (Tel Aviv: Springer Open, 2020), 71.

304 Jonathan O'Callaghan, "What Is Space Junk and Why Is It a Problem?," National History Museum, accessed August 24, 2022, https://www.nhm.ac.uk/discover/what-is-space-junk-and-why-is-it-a-problem.html.

305 Dinstein and Willy Dahl, 72.

306 NASA, "Spacecraft Disposal," accessed January 10, 2023, https://solc.gsfc.nasa.gov/modules/disposal/mainMenu_textOnly.php.

mission are implemented and components are shut down, a satellite moves into its final orbit for disposal either in higher orbit to avoid collision with other satellites or LEO to burn in the atmosphere.[307] If decommissioned satellites may not revitalize their functions by commands made in distance or without direct physical involvement, they should not be regarded as military objectives on the same ground as mentioned in previous examples – lack of contribution to the military action.

Abandonment of a military objective by nature does not change its status either. During operation Iraqi Freedom, the United States decided not to target abandoned Iraqi military vehicle so as they could be used by a post occupation Iraqi army. Despite this, these vehicles were re-occupied by the Iraqi military afterwards.[308] These vehicles have never lost the status of military objective. Therefore, it is important to understand that despite the object is not used or may not be used by the military due to circumstances ruling at the time, it does not necessarily mean that it is not capable of making effective contribution to the military action. If, for instance, the captured satellite control centre is abandoned, it remains a military objective as it may be reoccupied in the future (also see "2.2.1.4. Purpose").

Military objectives by nature might be movable, such as satellites, or immovable, such as satellite communications facilities.[309] It should also be borne in mind that military objectives by nature may not alter their status to civilian and otherwise.[310] Until their function (and sometimes ownership) is changed, they are military objectives permanently. For example, the status of military barracks temporarily sheltering civilian refugees does not shift from military to civilian just because they are temporarily inhabited by civilians. Similarly, the status of military weather satellite or IMINT satellite would not change if data was temporarily shared with civil meteorological institutions or rescue services for civilian purposes.

However, if these barracks were transformed into civilian refugee shelter to serve only civilian function which would not otherwise make an effective contribution to military action or military weather or IMINT satellite ownership and control was transferred to a civilian entity, such a facility or a satellite should not qualify as military objective.

2.2.1.3. Location

The second criterion concerns the location of objects. Obviously, there are objects which by their nature have no military value, they are not used by the military or they are not purposed for the military. However, their location might indicate the ability to effectively contribute to military action. Authors of ICRC IAP Commentary give an example of bridges or other construction, which is of "special importance for military

307 NASA, "Spacecraft Disposal".

308 Henderson, *The Contemporary Law of Targeting*, 55-56.

309 Henderson, *The Contemporary Law of Targeting*, 73.

310 Dinstein, *Oslo Manual*, 78.

operations in view of its location, either because it is a site that must be seized or because it is important to prevent the enemy from seizing it, or otherwise because it is a matter of forcing the enemy to retreat from it."[311] For some authors, bridges constitute military objectives not by location but by nature as long as they apt to have a perceptible role in the transport of military reinforcement and supplies. In such cases their "destruction is almost self-explanatory."[312]

The location of an object, however, cannot be too widespread. Some authors say, that "[t]here must be a distinctive feature turning a piece of land into a military objective, for example, an important mountain pass or defile; a trail in the jungle or in a swamp area; a bridgehead or a spit of land controlling the entrance of a harbour."[313] Therefore, the whole ocean, river, continent, mountain range or outer space may not be a legitimate military objective, while parts of them, might. Although the Author is of the view that intangible objects can hardly practically become targets, however, in this context, it may be contemplated on the question whether a specific orbit (or part of it) as a location inhabiting military satellites, may constitute a military objective. Michael N. Schmitt rather straightforwardly explains: "[p]erhaps the single-most distinguishing characteristic of space is its location; it represents the ultimate high ground from which the enemy may be observed and attacked. Thus, it constitutes a lucrative military objective by virtue of location."[314] He further gives an example: "[a] belligerent wishing to deprive an enemy of its use might, for instance, place space debris into a particular orbit or cause explosion at a specific point in sake to deprive the enemy of use at a certain moment." [315] At first glance it may seem that orbits might constitute military objectives, however, the focus on the purpose of the definition of military objective – which is the legal specification of a targetable object – should not be lost. In Author's view, an orbit itself is not the location *per se*, but rather a path that an object follows by interacting with another object in the form of gravitational force. This path would make no tangible sense for gravitational force to exist if one of the objects (such as a satellite or the Earth) was absent. Similarly, the path itself can hardly be targetable if it lacked at least one of the two objects with the mass. However, if not the orbit, but outer space was taken into consideration, qualification of it as a military objective by location might be more reasonable. Outer space is often described as a location above the Earth having no (or minor) molecules of air or even 100 km distance above the Earth.[316] Although it may be hard to portray outer space as a target, since it is often envisioned as the absence of anything material, however, from legal IHL's

311 ICRC IAP Commentary, 636.

312 Yoram Dinstein, "Legitimate Military Objectives under the Current Jus in Bello," *International Legal Studies* 78, no. August 1949 (2002): 151.

313 Dinstein, *Conduct in Hostilities, supra* 166, 101.

314 Schmitt, "International Law and Military Operations in Space." 117.

315 Schmitt. 117.

316 Eric Betz, "The Kármán Line: Where Does Space Begin?," Astronomy.com, 2021, https://astronomy.com/news/2021/03/the-krmn-line-where-does-space-begin.

perspective, especially in environmental context, arguments to treat outer space as a location might arise (see "2.6. Status of outer space under *jus in bello*"). This is because the condition of outer space forming part of the natural environment might be worsened in many ways, such as creation of space debris, the spill of dangerous substances, nuclear emulsion by an explosive, not to mention examples that were provided by Michael N. Schmitt previously. If even though a party to the conflict treated outer space as a military objective by location, it may do so only for a part which effectively contributes to military action. Therefore, a satellite constituting a military objective could not make the whole outer space a military objective.

Dale Stephens and Cassandra Steer give an example of a satellite which is not used by the military, however, in close proximity with a military satellite. Such satellite would become military objective under the criteria of "location" if its destruction would affect a military need due to its proximity to any other military object. Indeed, a civilian satellite being in close proximity with a military satellite for the purpose of immunising it from attacks would be regarded as military objective if other conditions (such as definite military advantage) are met.

Besides stating that an area being a legitimate military objective shall be only of a limited size, ICRC IAP Commentary also indicates that "this concept is only valid in the combat area."[317] This view has been criticized as finding no support neither in IAP *travaux préparatoires,* nor state practice and customary law.[318] Indeed, it would make no sense if a certain path is used by the enemy to transport munition to the combat zone and does not constitute a legitimate military object. Moreover, it is unclear why only the criteria of nature is limited to the combat zone, but not the objects which are used, will be used, owned or controlled by the military. Therefore, the Author believes that the object may qualify for military objective on the ground of nature independently from its proximity to combat zone.

An object may be attacked due to its location to further subsequent military operations.[319] Robertson indicates that civilian buildings may become military objectives if their nature obstruct the field of fire for attack on another valid military objective.[320] However, it should be noted that such a wide interpretation could be used for manipulative purposes making many civilian objects legitimate targets. The notion "definite military advantage" is related to actual and real military advantage, not potential or indeterminate advantage (*see* "2.2.2 The subjective element of military objective"). Moreover, an attack on obstructing civilian object could be part of larger operation against a legitimate military object and hence be subjected to the requirements of the principle of proportionality (see "3.8.3. Principle of proportionality in the IAP").

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317 ICRC IAP Commentary, 637.

318 Henderson, *The Contemporary Law of Targeting*. 56.

319 Henderson, *The Contemporary Law of Targeting*, 57.

320 Robertson, "The Principle of the Military Objective in the Law of Armed Conflict." 49.

2.2.1.4. Purpose

The criterion "purpose" evidently reflects the intended future use of an object, as opposed to the use, which concerns the present function. In some cases, purpose may overlap with nature. For example, a newly constructed military reconnaissance satellite soon to be launched into outer space is a military objective by nature because it belongs to the military, however, once operative, it is also a military objective by purpose. However, purpose does not indicate by itself the military ownership or control of an object, whereas the nature of the object does.

Probably any object might be used for military purposes in the future but that does not make them present legitimate targets. Otherwise, any attack on civilian object could be justified this way. The characteristic of purpose is relatively hard to apply in practice, since the future military use of a civilian object is usually unknown. Some authors suggest that purpose could hardly ever be a deciding factor, especially given the limitation of "in the circumstances ruling at the time."[321] Others argue that it is sufficient to have reasonable "likelihood of military use" to qualify for military objective as such.[322] International tribunals took different approach. ICTY trial chamber in *Galić* case had set even higher threshold in applying criteria of purpose: "such an object [civilian] shall not be attacked when it is not reasonable to believe, in the circumstances of the person contemplating the attack, including the information available to the latter, that the object is being used to make an effective contribution to military action."[323] For ICTY, the mere likelihood of potential use of an object does not render an object military objective. There needs to be a certain proof of actual intention to use an object for military purposes. For example, if there was reliable intelligence data indicating plans of the enemy to use JDAM missiles at a specific target during specific time, it may be calculated which GNSS satellite (or satellites) at the given time would provide positioning data for JDAM missiles and, hence, qualify for military objectives.

The intelligence data, under which the future purpose of use of a potential target may be established, sometimes consisting of fragmented pieces of information, may as well be misleading.[324] Some suggest that intelligence data should be evaluated with due care, especially when there is doubt about the planned use of objects, the primary function of which is civilian, such as hospitals, schools, places of worship and cultural property.[325] For example, the field intelligence data indicating that the enemy intends to use a school as a munitions depot does not justify an attack by itself, at least as long as no practical steps have been taken to move the munitions in.[326] During the

321 A. P. V. Rogers, *Law on the Battlefield*, 2nd ed. (Manchester: Manchester University Press, 2012), 67.

322 Michael N. Schmitt, "Wired Warfare: Computer Network Attack and Jus in Bello," *International Review of the Red Cross* 84, no. 846 (2002): 385.

323 Prosecutor v. Galic, IT-98-29-T, para. 51.

324 Ibid. 100.

325 Ibid.

326 Ibid.

Falklands/Malvinas armed conflict in 1982 the British Government used merchant ships from 33 different civilian companies loaded with heavy artillery and mobility assets, including helicopters, in order to reach Falklands.[327] From the moment the British Government indicated in its order specific ships to be used for logistical purposes in the Falklands/Malvinas armed conflict, they became military objectives by purpose and from the moment they left the port, they became military objectives by use. We may similarly argue that no civilian satellite shall be attacked unless such statements are made or intelligence data on their future use appears gradually prove itself.

The data of a civilian weather satellite could potentially be used by the military, but that does not necessarily mean that it has an indefinite status of military objective. If, for example, intelligence data suggested that a military attack is planned to be carried during specific weather conditions, such as heavy storm, mist, rain – the weather satellite might fit the definition of military objective. However, in all cases, indicators of potential military use of an object should be evaluated with due diligence, suggestibly double-checked, alternative sources of information confirmation should be searched for. If possible, it is suggestable that attacks on satellites be made only when certain preparatory activities (see "3.7.6. Precautions in attacks") prove intelligence data to be correct.

International Law Association Study Group on the Conduct of Hostilities in the 21st Century (hereinafter – ILA Group) presented a report in 2016 (hereinafter – 2016 ILA Group Report) where it contemplated the question of information needed to conclude that there is an intent to use an object for military purposes. ILA Group found that there must be clear indications that the enemy will use an object for military action. Secondly, the information must be objective and allow a reasonable commander to conclude that a specific object will, in the future, be used for contributing to the enemy's military action. This information must refer to a specific object (and not a class of objects), because each object must individually fulfil conditions under the definition of military objective. Thirdly, the evidence need not to be absolutely accurate. It suffices that a reasonable commander who bases her/his decision on the information from all sources which are available to him/her concludes that he/she has sufficiently reliable information to determine that an object will make an effective contribution to the enemy's military action in the near future.[328]

The information available to the attacker should indicate actual intention to use a specific satellite for military purposes in the future. It is not the potential that renders an object a military objective, but the evidence making that potential probable. For satellites to be targetable under the criteria of purpose, information available at the time should suggest inevitable use of a satellite to support (or even implement) military

327 Harry D Train II, "An Analysis of the Falkland/Malvinas Islands Campaign," *Naval War College Review* 41, no. 1 (1988): 38. Arthur M. Smith, "Logistics in The Falklands War," JMVH, 2017, accessed August 18, 2021, https://jmvh.org/article/logistics-in-the-falklands-war/.

328 International Law Association Study Group, "The Conduct of Hostilities and International Humanitarian Law: Challenges of 21st Century Warfare," *International Law Studies* 93 (2017): 92-93.

action. Targeting satellites based on information about their future use should be selective – not the whole constellation, but rather specific satellites relevant for specific military operation should be identified for the attack to be legitimate. That means that satellite constellations may not by themselves be treated as military objectives merely because one or few satellites forming part of constellation are military objectives. Each specific satellite should be evaluated separately.

2.2.1.5. Use

The criterion "use" concerns the present function of an object – the current employment of an object. Some objects, such as schools, hospitals, warehouses might be used for military purposes, such as when military headquarters are established or munitions kept in civilian premises. The question rises whether the temporal use of an object changes its status permanently, or only temporary for the time the object is being used for military purposes.

In analogy, IAP Article 51(3) states that civilians enjoy the protection from direct attacks unless and for such time as they take direct part in hostilities. This rule evidently suggests that civilians who stop direct participation in hostilities retrieve the previously granted protection.[329] Is the status of civilian objects analogically dynamic as the status of civilians? If, for instance, Galileo constellation satellite is used to navigate smart missile, does the satellite (satellites) transmitting positioning data become a military objective only for the time of missile travel, longer period or permanently?

The notion "circumstances ruling at the time" suggest that the status of an object might change dependently from its use. For example, if the church was used to shelter troops at night before they kept going to another destination point, the church should have regained protective civilian object status as soon as troops left it. The UK Joint Service Manual of the Law of Armed Conflict emphasizes the importance of the notion "circumstances ruling at the time". The example is given: "[i]f, for example, the enemy moved a divisional headquarters into a disused textile factory, an attack on that headquarters would be permissible (even though the factory might be destroyed in the process) because of the prevailing circumstances. Once the enemy moved their headquarters away, the circumstances would change again and the immunity of the factory would be restored."[330] "Circumstances ruling at the time" also indicate the requirement to evaluate status of an object in the present sense, not at some hypothetical future

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329 It should be emphasized that according to the ICRC's proposed interpretative guidance on direct participation in hostilities the protective status of civilian does not necessarily cease to exist or is retained with the active combat of civilian. In some cases, mere deployment or return from the mission would suffice for the status shift. *See* N. Melzer, "*Interpretive Guidance on the Notion of Direct Participation in Hostilities*," (Geneva: International Committee of the Red Cross, 2009), 65-68.

330 Ministry of Defence, "JSP 383: The Joint Service Manual of the Law of Armed Conflict," Pub. L. No. JSP 38, Joint Service Publication 383 1 (2004), 56, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/27874/JSP3832004Edition.pdf.

time.[331] As noted in the Bothe's IAP Commentary, "[t]his element emphasizes that in the dynamic circumstances of armed conflict, objects which may have been military objectives yesterday, may no longer be such today and vice versa. Thus, timely and reliable information of the military situation is an important element in the selection of targets for attack."

It should be reminded that in some cases a military objective might qualify so merely by its nature without actual use. Therefore, it is notable that the criterion of "use" primarily functions when an object is a civilian by nature because otherwise it would stand as military objective by the criterion of "nature". Dinstein has put it this way: "<…> if an object qualifies as a military objective by nature it remains so classified irrespective of its current use. A military objective by "nature" can be attacked independently of its present "use", while a military objective by "use" can be attacked only if it is actually used for military purposes."[332]

To sum up, the status of a civilian or civilian object might shift from protective to targetable and *vice versa* dependently from circumstances. Satellites may as well switch status, however, other criteria need to be considered as well. Satellites might not be used by the enemy, but have the purpose, nature and even location to qualify for military objectives. If a satellite belongs to armed forces, even if it is not used by the military, it remains a military objective by nature and, hence, the status does not change. A satellite having primary civilian functions may alter the status dependently from time when it is being used by the military or it becomes clear that a specific satellite will be used for the purposes of military action in the near future.

2.2.2. The subjective element of military objective

The second part of a two-pronged military objective test requires the estimation of the likely results from the planned attack. As already mentioned, the partial or total destruction, capture or neutralization of an object must offer a definite military advantage. The notions destruction, capture, neutralization, and definite military advantage are explained below.

The word "destroy" means damaging something so badly that it cannot be used.[333] Hence, destruction means the cause of so much damage to an object that it is no longer operative – has permanently lost its functionality. "Capture" means taking control of an object and preventing its use by the enemy. In contrast to "destruction", the captured object does not lose its functionality, however, the previous possessor of an object may not be able to use it anymore. "Neutralization" means the action of stopping

331 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949,* 365.

332 Dinstein and Willy Dahl, *Oslo Manual on Select Topics of the Law of Armed Conflict. Rules and Commentary*. 71.

333 "Cambridge Online Dictionary," accessed July 20, 2022, https://dictionary.cambridge.org/.

something from having an effect.[334] United States DoD Dictionary of Military and Associated Terms defines the term "neutralize" as pertains to military operations – to render ineffective or unusable.[335] Therefore, it similarly means the denying of the use of an object to the enemy without necessarily destroying or capturing it.[336] However, "neutralization" differs from "destruction" in a way that the neutralized object may not be operative, however, its functions may be rebuilt and continue to produce its effects. It may be said that a neutralized object is temporarily inactive while the destroyed one may no longer be active. In the former case, a satellite whose transistor is melted by a laser is considered as neutralised, because components of satellites may be changed. In another case, a satellite destroyed by a kinetic kill vehicle is destroyed, as it is shattered into multiple non-collectible pieces and may not be rebuilt.

A captured satellite does not necessarily have to be in actual physical control of an enemy and in most cases it probably would not. However, to capture a satellite would mean taking control of its main functions, that is – sending signals to Earth, receiving signals from Earth and in some cases obtaining ability to control its manoeuvre in space. The capture of a satellite in practice would not be the physical control of a satellite itself, but the control of a tracking telemetry and control systems (software) or the ground station (hardware) which would enable physical control of it afterwards. Satellite capture may occur by a cyber-attack breaking into satellite control systems or physically occupying ground station and obtaining control without any cyber interference.

Bothe's IAP Commentary gives an example of neutralization where a specific area of land being a military objective is neutralized by laying landmines on it, thus denying its use to the enemy.[337] A satellite would be considered as neutralized if, for example, its essential hardware components necessary for its operation were melted by a laser. Such components might be repaired or changed, hence, a satellite in question would be considered as neutralised rather than destroyed. In February 2020, a pair of Russian satellites were tailing United States spy satellite slightly below its altitude causing the shadowing of its signal path to Earth.[338] Such a confrontation marked the first time the United States military has publicly identified a direct threat to a specific American satellite by an adversary.[339] Satellite signal blocking may as well be an example of satellite neutralization, which is a temporal state of function loss.

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334 "Cambridge Online Dictionary."

335 Office of the Chairman of the Joint Chiefs of Staff, "DOD Dictionary of Military and Associated Terms," Joint Education and Doctrine Division, J-7 § (2020), 153. https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf.

336 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 367.

337 Bothe, Partsch, and Solf. 367.

338 W. J. Hennigan, "Exclusive: Strange Russian Spacecraft Shadowing UNITED STATES Spy Satellite, General Says," Time, n.d., https://time.com/5779315/russian-spacecraft-spy-satellite-space-force/.

339 Hennigan.

The 1868 St. Petersburg Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight (hereinafter – 1868 St. Petersburg Declaration) preamble states "[t]hat the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy".[340] Similarly, Authors of ICRC IAP Commentary stated that "military advantage can only consist in ground gained and in annihilating or weakening the enemy armed forces."[341] So, probably the essence of definition of military advantage, is the ultimate goal to weaken enemy armed forces as the opposite of spreading terror among civilian population. The military advantage should be military in nature, not merely political or otherwise ideological. Sassoli notes that "[t]aken literally, the separate requirement that the attack must offer a definite military advantage means that even an attack on an objective of a military nature would not be lawful, if its main purpose is to affect the morale of the civilian population and not to reduce the military strength of the enemy."[342] The Varvarin bridge bombing by NATO in 1999 is an example of questionable military advantage. Even though bridges usually serve military purposes due to their location or purpose, the Varvarin bridge did not contribute to any war effort of the Yugoslav army, nor did its destruction gave NATO alliance any definite military advantage.[343]

The weakening of the enemy is not limited only to directly causing a physical weakening of enemy personnel but also weakening the enemy's war fighting and defending capability. Therefore, the weakening of enemy's armed forces may be implemented either directly or indirectly.[344] For instance, attacking a factory which produces military equipment (helmets, uniform) is an example of indirect weakening of the enemy.

The notion "military advantage" is repeatedly mentioned in various articles of IAP.[345] It does, however, come with different pronouns and adjectives that shape different understanding of what actually stands under one or other rule mentioning this notion. For example, Article 28 of IAP prohibits that use of medical aircraft to attempt to acquire *any* military advantage. Articles 51(5)(b) and 57(2)(iii) framing the customary principle of proportionality prohibit certain attacks which would be excessive in relation to the *concrete and direct* military advantage anticipated. Compared to the

340 "Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight. Saint Petersburg, 29 November / 11 December 1868" (hereinafter - 1868 St. Petersburg Declaration), https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=568842C2B90F4A29C12563CD0051547C.

341 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 685.

342 Marco Sassòli, "Legitimate Targets of Attack under International Humanitarian Law," *International Humanitarian Law Research Initiative*, 2003, http://www.annualreviews.org/doi/10.1146/annurev.pharmtox.41.1.789.

343 Konstantin Obradovic, "International Humanitarian Law and the Kosovo Crisis," *International Review of the Red Cross* 82, no. 839 (2000): 721.

344 Henderson, *The Contemporary Law of Targeting*. 61-62.

345 Arts. 28(1), 51(5)(b), 52(2), 57(2)(a)(iii)-(b), 57(3).

Article 28 requirement, the military advantage in applying principle of proportionality is more restrictive and conditional because Article 28 establishes an absolute prohibition, while Article 51 and 57 – only a conditional one. Article 52(2), which is discussed in this subchapter, requires the military advantage to be *definite* and not necessarily concrete and direct. It means that Article 52(2) is the strictest among all articles that mention the notion "military advantage". At least one conclusion may come up due to the descriptive words chosen by the drafters of IAP – the legal notion "military advantage" has different meanings in various rules of IAP and should be analysed dependently from the context where it is used. In context of defining which objects are permissible to be directly attacked, the analysis of the "definite military advantage" notion should be place in this context.

What constitutes a definite military advantage is a subjective element of the military objective notion because this requirement is based on the perception of an attacker, not the status of an object. Taken literal meaning of "definite", it may be said that it is not legitimate to launch an attack against objects which offers only a potential or indeterminate advantage,[346] it should be concrete and measurable. The adjective definite was the product of extensive discussion in the working group of drafting IAP.[347] Among the adjectives considered and rejected were distinct, clear, immediate, obvious, specific and substantial. The rapporteur of the relative working group commented that he was unable to draw any significance from his choice.[348] But it has been suggested that definite rather than relative had the effect of excluding the rule of proportionality as a criterion for the interpretation of the term military objective, for an attack may offer a definite military advantage whether or not excessive collateral damage is caused by it.[349] According to Rodgers, definite also excludes "<…> a fanciful estimate of the military advantage or one that is not based on proper information <…> or it means a concrete and perceptible military advantage rather than a hypothetical and speculative one.[350] Authors of Bothe's IAP Commentary conclude that "definite" should be understood as a "<…> word of limitation denoting in this context a concrete and perceptible military advantage rather than a hypothetical and speculative one."[351]

However, the problem is that determination of the military advantage and whether it exists in specific circumstances is not mathematical in sense,[352] it remains very much

346 IAP Commentary, *supra* 164, 636.

347 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 367.

348 "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts," in *International Review of the Red Cross*, vol. XV (Geneva, n.d.), 1–529, 332. https://doi.org/10.1017/s0020860400021227.

349 Rogers, *The Law on the Battlefield*. 65.

350 Rogers. 65.

351 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 367.

352 Henderson, *The Contemporary Law of Targeting*, *supra* 168, 71.

subjective. As it is indicated in the ICRC IAP Commentary, "it remains the case that the text adopted by the Diplomatic Conference largely relies on the judgment of soldiers who will have to apply these provisions."[353] The authors of the ICRC IAP Commentary added that "[t]he text of this paragraph certainly constitutes a valuable guide, but it will not always be easy to interpret, particularly for those who have to decide about an attack and on the means and methods to be used."[354]

Military advantage is not limited to tactical or local gains – it needs to be measured as a whole, not merely for an isolated attack.[355] That means that the military advantage from one part of the military campaign need not to be separately evaluated, the specific attack may add to overall military advantage of the whole military operation. The Statute of International Criminal Court even uses the term "overall military advantage".[356] Authors of Bothe's IAP Commentary indicated that the judgement of definite military advantage from the attack should be made in context of anticipated military advantage from the specific military operation of which the attack is a part and considered as a whole and not only from isolated or particular parts of that operation.[357] In other words, prediction of specific damage should be taken into account while estimating a general military gain by that damage. More interestingly, authors of Bothe's IAP Commentary stressed, that it is not necessary that the contribution made by the object to the Party attacked be related to the advantage anticipated by the attacker from the destruction, capture or neutralization of the object.[358] That is, the specific isolated attack might offer a vague military advantage, but taken that specific attack in context of the whole military operation, the advantage might be evident. Authors of the Bothe's IAP Commentary gave an example of 1944 attacks made by Allies on *Pas de Calais* on bridges, fuel dumps, airfields and other targets, the primary military advantage of these attacks was not to reduce German military strength in *Pas de Calais* area, but rather to deceive the Germans into believing that the Allied amphibious assault would occur in the *Pas de Calais* instead of beaches of Normandy.[359]

The military advantage to be gained from the attack does not have to be material in nature, such as damaging or destructing the target. Henderson notes "while an object must contribute to the military action of the defending party, and while the attacker must gain a military advantage from an attack on that object, the military advantage gained need not be limited to the reduction in military action suffered by

353 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 638.

354 Pilloud et al. 635.

355 Dinstein, *Conduct in Hostilities, supra* 168, 94.

356 "Rome Statute of the International Criminal Court," U.N. Doc. A/CONF.183/9 (1998), Art. 8(2)(b)(iv).

357 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949,* 366.

358 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts.*

359 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts.*

the defending party as a direct result of the damage caused to the attacked object.[360]

It should be noted that the military advantage needs not to be immediate. IAP Article 52(2) does not require that the military advantage gained come from the direct or immediate disadvantage cause to the enemy.[361] In other words, the enemy might be weakened indirectly and that would suffice for the definite military advantage test.

In general, the subjective element of military objective means that the military advantage which is about to be gained after successful attack is concrete and perceptible, not hypothetical or circumstantial. Therefore, we must say that the effects of a satellite attack and how these effects add to the military advantage need to be visible to the attacker. In other words, the attacker is required to possess knowledge not only about general characteristics of a satellite, but also what would actually happen after a satellite is destroyed, neutralized or captured. If the effects of the attack offer a specific military advantage, even if that advantage appears through a certain time span or in an indirect chain of perceptible events, the attack would be legitimate. Despite the requirement that the military advantage of the attack needs to be evident, the evaluation process of the military advantage needs not to be limited with the attack – the military advantage needs to be measured as a whole, not necessarily from an isolated act.

2.3. The status of dual-use objects

Although IHL is often described as a law of balance between the military need and limitations set to achieve that need, it is relatively strict and uncompromising when defining status of persons or objects – there are combatants and non-combatants, military objectives and non-military objectives. There is no intermediate status of a person or an object. The legal status may shift from protective to non-protective and *vice versa*, but IHL would not leave a person or object neither targetable, nor protected. In that case, IHL is either black or white.

The term "dual-use" aims to indicate the functionality of an object which serves both, civilian and military purposes, or, put it differently, is used by civilians *and* the military. The term "dual-use object" does not appear in the 1907 Hague Conventions, 1949 Geneva conventions or their 1977 Additional Protocols, neither in other international multilateral treaties regulating conduct in hostilities. Hence, in context of IHL, it is rather a morphological than a legal notion. The term itself is misleading, since it gives an impression that an object at the same time has civilian and military status. But, as mentioned before, IHL does not allow such legal treatment.

The term has risen out of an apparent need to describe objects which do not fit presumption of civilian object set Article 52(3) of IAP.[362] Article 52(3) reads as follows: "[i]n case of doubt whether an object which is normally dedicated to civilian purposes, such as a place of worship, a house or other dwelling or a school, is being

360 Henderson, *Contemporary Law of Targeting*, 53.

361 Henderson.

362 Solis, *The Law of Armed Conflict. International Humanitarian Law in War*. 534.

used to make an effective contribution to military action, it shall be presumed not to be so used." For some objects such a presumption cannot be readily applied, because these objects might serve both, civilian and military functions. Examples of these objects include bridges, highways, ports, power grids, radio and television broadcasting infrastructure, fossil fuel extraction sites, airports (especially runways), railways, other strategic objects.

Satellites, in fact, are often dually used. GNSS satellites is probably the most common example to this as they play an important role in both, civilian and military environments. In context of civilian use, GNSS satellites enable accurate navigation by aircrafts, ships, private vehicles. Buses and trains use GNSS to inform passengers of platform arrival times, they also help to locate position of trains, manage train traffic and avoid accidents,[363] monitor ship[364] or highway traffic.[365] Satellites play an important role in development of autonomous vehicles.[366] The synchronized atomic clocks installed in GNSS satellites are widely used in many services. Cell phones and data networks use GPS time to keep all of their base stations in perfect synchronization. This allows mobile handsets to share limited radio spectrum more efficiently.[367] Similarly, digital broadcast radio services use GPS time to ensure that the bits from all radio stations arrive at receivers in lockstep. This allows listeners to tune between stations with a minimum of delay.[368] Financial transactions have stamped time and date. It is now legally required for trading companies to establish an audit trail of exactly when a transaction was made.[369] Exchange companies, banks, market makers and hedge funds use GPS to time-stamp business transactions, providing a consistent and accurate way to maintain records and ensure their traceability.[370] Major financial institutions use GPS to obtain precise time for setting internal clocks used to create financial transaction timestamps. Large and

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363 A. Filip et al., "GPS/GNSS Based Train Position Locator for Railway Signalling," in *Computers in Railways VII*, ed. C.A. Brebbia et al., 2000, 1227–42, https://www.witpress.com/Secure/elibrary/papers/CR00/CR00120FU.pdf.

364 "Boosting Marine Traffic Monitoring via Satellite," The European Space Agency, 2014, https://www.esa.int/Applications/Telecommunications_Integrated_Applications/Boosting_marine_traffic_monitoring_via_satellite.

365 Sebastien Drouyer and de Franchis Franchis, "Highway Traffic Monitoring on Medium Resolution Satellite Images" (Yokohama, 2019), https://hal.archives-ouvertes.fr/hal-02387110/document.

366 Roger Lanctot, "Satellites and Autonomous Vehicles," Via Satellite, 2019, https://interactive.satellitetoday.com/via/may-2019/satellites-and-autonomous-vehicles/.

367 "Timing," GPS.GOV, accessed June 1, 2022, https://www.gps.gov/applications/timing/.

368 "Timing."

369 Rhys Dr. Lewis, "How Atomic Clocks Are Finding New Life in the Emerging Quantum Industries," NPL, 2019, http://talkquantum.npl.co.uk/blog/how-atomic-clocks-are-finding-new-life-in-the-emerging-quantum-industries/.

370 European Agency for the Space Programme, "Report on Time & Synchronisation User Needs and Requirements: Outcome of the EUSPA User Consultation Platform," 2019, https://www.gsc-europa.eu/sites/default/files/sites/all/files/Report_on_User_Needs_and_Requirements_Timing_Synchronisation.pdf.

small businesses are turning to automated systems that can track, update, and manage multiple transactions made by a global network of customers, and these require accurate timing information available through GPS.[371] Distributed networks of instruments that must work together to precisely measure common events require timing sources that can guarantee accuracy at several points. GPS-based timing works exceptionally well for any application in which precise timing is required by devices that are dispersed over wide geographic areas. For example, integration of GPS time into seismic monitoring networks enables researchers to quickly locate the epicenters of earthquakes and other seismic events.[372] The efficiency of power transmission and distribution depends on satellite time as well. Repeated power blackouts have demonstrated to power companies the need for improved time synchronization throughout the power grid. That led to the installment of GPS-based time synchronization devices in power plants and substations. By analyzing the precise timing of an electrical anomaly as it propagates through a grid, engineers can trace back the exact location of a power line break.[373] By simultaneously receiving the same GPS signal in two places and comparing the results, the atomic clock time at one location can be communicated to the other. National laboratories around the world use this "common view" technique to compare their time scales and establish Coordinated Universal Time (UTC). They use the same technique to disseminate their time scales to their own nations.[374] Hollywood studios are incorporating GPS in their movie slates, allowing for unparalleled control of audio and video data, as well as multicamera sequencing. The ultimate applications for GPS, like the time they measure, are limitless.[375]

Satellites help monitor Earth's environment. The sensors of satellites provide environmental data in weather forecasting. As of the launch of weather satellites (especially Geostationary Operational Environmental Satellites, hereinafter – GOES), hurricane forecasts became accurate and never missed.[376] During the 1985 Ohio-Pennsylvania tornado, near-real time satellite imagery helped to provide a tornado watch warning from eastern Ohio into western parts of New York and Pennsylvania which saved many lives.[377] Technological improvements gave scientists the ability to monitor long-term changes in climate, from the subtle onset of drought and its impact on vegetation to monitoring global sea-surface temperatures that signal atmospheric phenomena such as El Niño and La Niña.[378] Space weather forecast is equally important – GOES

371 "Timing."

372 "Timing."

373 "Timing."

374 "Timing."

375 Ibid. Quout.

376 Charles Q. Choi, "How Weather Satellites Changed the World," Space.com, 2010, https://www.space.com/8186-weather-satellites-changed-world.html.

377 Choi.

378 Choi.

and National Oceanic and Atmospheric Administration's (hereinafter – NOAA) polar satellites help spotting radiation from the Sun and in this way prevent damage to radiation sensitive equipment, such as electric grids, and allow their operators take steps to avert failures, as well as give early warning to astronauts on the ISS to seek shelter.[379] Weather satellites, such as Ionospheric Connection Explorer, help to study Earth's ionosphere and better understand the link between space weather and terrestrial weather.[380] Radio waves and GPS signals pass directly the ionosphere and signals may be distorted by patches of ionized material.[381]

On the other hand, GNSS satellites are of great importance to the military. GNSS satellites not only facilitate navigation of armed forces. During Operations Enduring Freedom and Iraqi Freedom, GPS contributions to warfighting increased significantly. The GPS satellite constellation enabled accurate delivery of JDAMs with high precision and minimal collateral damage.[382] GPS coordinates also enable casualty evacuation and navigating out of dangerous situations in combat. In addition, airmen conduct resupply missions with battlefield precision airdrops to combat forces with GPS-guided parachute-delivered equipment pallets, known as "Smart Pallets."[383] Satellites provide near–real time strike reporting and damage assessment data. The timely information allows military commanders to quickly employ smart weapons (such as JDAMs) and deploy them against functioning targets to avoid future strikes or even prevent strikes of already launched missiles. From humanitarian perspective, the precise battlefield data helps to choose and destroy specific targets, guide munitions, and thereby cause less collateral damage.

Satellite observations of weather conditions have been used directly in the planning of military operations since the Vietnam War.[384] Military weather satellites are essential for IMINT satellite support able to provide secure and timely meteorological data, including cloud cover information, helping in planning military operations or taking active combat.[385] Since mid-1960's, US Department of Defence initiated a specific space program (the Defense Meteorological Satellite Program, hereinafter – DMSP) to generate terrestrial and space weather data in the visual and infrared

379 Choi.

380 Amy Thompson, "NASA Launches Long-Delayed ICON Space Weather Satellite to Study Earth's Ionosphere," Space.com, 2019, https://www.space.com/nasa-icon-space-weather-mission-launch-success.html.

381 Thompson.

382 Benjamin S. Lambeth, *Air Power Against Terror: America's Conduct of Operation Enduring Freedom*, *Operation Pedro Pan* (Santa Monica: RAND Corporation, 2005), 79-82, https://www.rand.org/content/dam/rand/pubs/monographs/2006/RAND_MG166-1.pdf.

383 Tyler Whiting, "GPS Celebrates 25th Year of Operation," Space Force News, 2020, https://www.spaceforce.mil/News/article/2166101/gps-celebrates-25th-year-of-operation/.

384 Michael Bennet, "Options for Modernizing Military Weather Satellite" (Washington, D.C., 2012), 1, https://www.lexissecuritiesmosaic.com/gateway/cbo/working-and-technical-papers/09-20-Weather-Satellites.pdf.

385 Angelo. 111

spectrum for operational forces.[386] Satellites of DMSP program are able to track environmental features as clouds, bodies of water, snow, fire, and pollution in the visual and infrared spectrum.[387]On the ground of functionality, dual use-objects may be classified into these groups:

1. Objects which are alternatively used for military and civilian purposes. These objects usually serve civilian functions, but sometimes may be used by the military. Examples include: civilian airports, bridges, railways, etc.;
2. Objects which are simultaneously used for military and civilian purposes. These objects usually serve military and civilian functions at the same time. Due to certain peculiarities of these objects, it is practically impossible to determine whether an object is used for either of the purposes at an actual time. Examples of these objects include: power grids, communication towers, GNSS satellites, cyber networks, etc.;
3. Objects which are only partly used for military purposes at the same time. The most common example of this is a block building where some premises (such as apartments) or floors (such as the roof or basement or any other floor) may be used for military purposes whereas other premises at the same time are used only for civilian purposes.

As it was mentioned earlier, the only targetable objects are military objectives. One out of four characteristics that makes certain objects targetable is their use. If an object is used by the military and such use makes effective contribution to military action *and* only if the destruction, capture or neutralization of such an object would offer a definite military advantage, such an object would constitute a military objective and could be legally attacked. Accordingly, it would seem that dual-use objects are military objectives not only by their given name (that they are dually *used*), but also because definition of military objective does not make any exceptions which would immunize objects that are also used for civilian purposes. In other words, any civilian object which starts being used for military purposes, even if it is simultaneously used for civilian purposes, becomes a military objective. Despite the relatively clear ordinance of IAP Article 52(2), dual-use objects raise multiple legal questions. To illustrate them, a few examples are given below.

2.3.1. Legal issues related to the dual-use objects

In February, 1990 during Gulf War I, the Amiriyah shelter, known as Al Firdos bunker in Baghdad was added to the target list by United States war planners as a newly established and activated Iraqi command shelter. Signal trafficking and daytime satellite photography indicated that the bunker was used by a military leadership. The shelter was bombed the same month by laser-guided bombs. In the aftermath of the attack, it appeared that hundreds of civilians, possibly the families of elite personnel,

386 "Defense Meteorological Satellite Program."

387 Office of Satellite and Product Operations, "Defense Meteorological Satellite Program (DMSP)."

were using the shelter as a refuge escape for night time bombing. About 400 Iraqi civilians, mostly women and children were killed in the attack and another 200 were left severely injured.[388]

In 2009, Israeli mortar shells killed 40 Palestinian civilians in the proximity of the United Nations school. Israeli military contended that Hamas fighters fired mortars from the school compound. At the same time, the school was used as a civilian shelter and as a shield to wage mortar strikes from.[389]

In 2010, United States targeted electricity towers in Baghdad which, as claimed, ensured electricity supply for both, military and civilians at the same time, however, out of 22 towers that were destroyed in one month not necessarily all were used by the military.[390]

In 2021, Israel Defence Forces conducted an airstrike on Al Jalaa Tower in Gaza Strip which caused it to collapse. Among 60 apartments in the Al Jalaa Tower, there were offices used by the Associated Press and Al Jazeera news agencies. The Israeli army claimed there were military interests of the Hamas intelligence in the building and it accused the group running the territory of using journalists as human shields.[391] At the time of destruction of the building, Hamas was not using it.[392]

The four examples raise legal questions that may not be easily seen and the Author presents them further.

In case of Amiriyah shelter, the bunker was used by the insurgent forces daily, while by civilians nightly. The situation of such a mixed use of the shelter continued for some time[393] and we could say that there was some kind of tendency of the shelter's use. As one of the elements in the definition of military objectives requires an object to make effective contribution to military action by its use, we could conclude that during daytime, the shelter most certainly was a military objective. However, the definition of military objective does not indicate whether there is a certain continuum of use, or should an object regain civilian status instantly after the last combatant (or insurgent) leaves the place or otherwise cease using the object. More to add, under the criterion of

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388 "The Battle for Hearts and Minds," The Washington Post, 1998, https://www.washingtonpost.com/wp-srv/inatl/longterm/fogofwar/vignettes/v8.htm.

389 Taghreed El-Khodary and Isabel Kershner, "Israeli Shells Kill 40 at Gaza U.N. School," The New York Times, 2009, https://www.nytimes.com/2009/01/07/world/middleeast/07mideast.html.

390 Khalid Al-Ansary, "Iraq's Shaky Power Grid Bombed 22 Times in a Month," Reuters, accessed August 6, 2021, https://www.reuters.com/article/idUSLDE64C1FH.

391 "'Give Us 10 Minutes': How Israel Bombed a Gaza Media Tower," Al Jazeera, accessed August 9, 2021, https://www.aljazeera.com/news/2021/5/15/give-us-10-minutes-how-israel-bombed-gaza-media-tower.

392 Adil Ahmad Haque, "The IDF's Unlawful Attack on Al Jalaa Tower," Just Security, accessed August 8, 2021, https://www.justsecurity.org/76657/the-idfs-unlawful-attack-on-al-jalaa-tower/.

393 It has been indicated that throughout more than 3 000 surveillance missions over Iraq, the nightly crowding of civilians has never been detected. Seth J. Frantzman, "30 Years after Amiriyah Shelter Bombing in Gulf War: Lessons from Tragedy," The Jerusalem Post, accessed August 9, 2021, https://www.jpost.com/middle-east/30-years-after-amiriyah-shelter-bombing-in-gulf-war-lessons-from-tragedy-659013.

purpose it would seem that the shelter constantly remained military objective, because it had a potential of use. In this context, we should remind that the decision to attack an object merely under the ground of purpose is highly questionable, especially when there is no clear intelligence or other data showing the intended (continued) use of an object. And clearly, the intelligence data collected for some time failed to show the massive movement of civilians to the bunker. Data showed an incomplete image of a potential target. That being said, we may ask the question whether the frequent status shift of an object from civilian to military and *vice versa* would have some implications on its continuous status? In other words, if in a prolonged period of time the status of an object changes back and forth, would it be legal to qualify an object as a military objective based on perception that the frequency of its use will continue?

The 2010 Baghdad electricity towers' attacks is an example of simultaneous use of an object for military and civilian purposes. Naturally, it is impossible to trace the energy flow directions, to identify specific towers which are used to transmit that energy and end-users who use that energy. In common critical infrastructure targeting cases, the ground of purpose is taken into account and whether the destruction of these objects offers a definite military advantage. If an object is being used simultaneously for military and civilian purposes, should it qualify for military objective? Or if it is impossible to trace the specific end-user of an object, can it be presumed to be used by the military?

The Al Jalaa Tower destruction case showed that the attacker perceived the whole building as a military objective despite the fact that most of the premises (such as apartments and offices) were hardly ever used to make effective contribution to military action. If only a small part of an object is being used for military purposes, does that render it whole a military objective? If one apartment of military use in the building renders the whole building a military objective, does that mean that any damage inside the building (civilian injuries and deaths, damage or destruction of non-military used property) does not fall under considerations of principle of proportionality (which excludes collateral damage from damage made to military objective)?

As it may intuitively be seen, all examples are relative to the function of satellites. Satellites may simultaneously be used by the military and civilians, they have multiple components but not all of them serve the military (like infrared sensors sensing ICMB launches, but not, for example, solar batteries) and usually it is impossible to estimate end-users satellite signals. The largest space object build to date is ISS. It has multiple modules build by various states having various purposes.[394] In case one module is used for military purposes, it may be questioned whether only the used module or the whole ISS would be targetable. The law does not provide any answers to this question. To contemplate dual-use object topic further, state practice, jurisprudence, positions of international organizations and scholars are presented.

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394 National Aeronautics and Space Administration, "Reference Guide to the Internaitonal Space Station," NASA, 2015, https://www.nasa.gov/sites/default/files/atoms/files/np-2015-05-022-jsc-iss-guide-2015-update-111015-508c.pdf.

2.3.2. Opinio juris on the status of dual-use objects

United States Law of War Manual indicates that dual-use objects, such as power stations or communications facilities, are military objectives. It states that "[i]f an object is a military objective, it is not a civilian object and may be made the object of attack."[395] United States Commander's Handbook on the Law of Land Warfare also states that "[t]he principle of proportionality does not impose an obligation to reduce the risk of harm to military objectives. <…> There is no obligation under the principle of proportionality to reduce the likelihood of harm to <…> other military objectives, even if such harm was an unintended result of the attack."[396] According to Schmitt, these explanations in United States military documents indicate that United States perceives an object to be military objective even if only a part of it is used for military purposes. Accordingly, an attack on the military objective, such as a block of apartments (even if it is not used in whole for military purposes), would not require any estimations and calculations of collateral damage inside of it, because United States would treat the whole building as military objective.[397]

Israel Defence Forces (IDF) commenting on the Al Jalaa Tower destruction stated, that "<..> the structure was a single unit that qualified as a military objective in its entirety, since through its use it made an effective contribution to Hamas's military action, and its destruction offered a definite military advantage to the IDF. In this respect, the classification of the whole building as a military objective remains correct regardless of its civilian nature and uses. <…> If we consider the whole structure to be one military objective, we can also exclude the civilian offices in the building from the proportionality analysis."[398] The perception of dual-use objects by Israel is somewhat similar, if not identical to the position of United States, as Israel based constructed their arguments based on perception of the whole building, not individual parts of it.

Military Manual on International Law Relevant to Danish Armed Forces in International Operations (hereinafter – Danish LOAC Manual) gives examples of dual use objects: bunkers used by military forces that are also used by civilians as a refuge, communications infrastructure, such as radio stations and IT communications servers used to inform the civilian population of the ongoing dangers of armed conflict,

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395 Department of Defense, "Department of Defence Law of War Manual (Updated)" (2016), 209. https://dod.defense.gov/Portals/1/Documents/pubs/DoD Law of War Manual - June 2015 Updated Dec 2016.pdf?ver=2016-12-13-172036-190.

396 Headquarters Department of the Army, "FM 6-27, C1: The Commander's Handbook on the Law of Land Warfare," Pub. L. No. FM 6-27 MCTP 11-10C, 208 (2019), 2-13. https://usnwc.libguides.com/ld.php?content_id=54893124.

397 Michael N. Schmitt, "Targeting Dual-Use Structures: An Alternative Interpretation," Articles of War, accessed August 9, 2021, https://lieber.westpoint.edu/targeting-dual-use-structures-alternative/.

398 Eli Bar-On, "Israel's Strike on the Gaza Media Building Complies with the Law of Armed Conflict," The Mryam Institute, accessed August 8, 2021, https://www.miryaminstitute.org/commentary-blog/israels-strike-on-the-gaza-media-building-complies-with-the-law-of-armed-conflict?fbclid=IwAR0hnt-WYZFPNr4L_AFfa2xUEY_aKxAeqlAyl-9Ss4ccsiHHx1IFA5P3pXPw.

bridges, roads and other infrastructure used by civilian and military vehicles as well as electricity networks that serve both military radar systems and communications networks but also deliver electricity to the hospitals and water supply and wastewater systems.[399] Danish LOAC Manual indicates "[a]s far as dual-use objects are concerned, the entire object constitutes a military objective. Under international law, this means that damage to the dual-use object in itself is not regarded as collateral either in whole or in part if the object is effectively indivisible. As a general rule, the non-military 'share' of the object should not be taken into consideration in the proportionality assessment."[400] However, Danish armed forces recognize that the non-military 'share' may sometimes fall under estimations of principle of proportionality, however, only if the non-military 'share' "<…>is of particular and direct importance to protected persons." [401] When the use of an object for military purposes is brought to an end (and it is not military in nature), the object must further be assessed by the criteria of purpose and location.[402]

Australian Defence Doctrine Publication on Targeting among other examples of dual-use targets, mentions media centers, public utilities providing support both the non-combatant civilian population and the combatant military.[403] Similarly as in previously mentioned states cases, Australia does upholds the position that principle of proportionality does not require estimation of collateral damage of military objectives: "Australia's Declarations of Understanding to the Additional Protocols indicates that Australia understands that the phrase in Article 52 of the Additional Protocol 1 the 'Attacks shall be limited strictly to military objectives' is not intended to, nor does it deal with the collateral effects resulting from an attack directed against a military objective."[404]

According to the French Manual on the Law of Armed Conflict (hereinafter – French LOAC Manual), certain objects might be used for mixed military and civilian purposes (*l'utilisation peut être mixte*). Electrical distribution network is given as an example of mixed used object. However, French LOAC Manual emphasizes the importance to conduct rigorous analysis of expected collateral damage when attacking a dual use object in order to respect principle of proportionality.[405] Despite the fact the French LOAC Manual does not directly indicate that electrical power

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399 Danish Ministry of Defence and Defence Command Denmark, "Military Manual on Internaitonal Law Relevant to Danish Armed Forces in International Operations" (2016), 300-301. https://usnwc.libguides.com/ld.php?content_id=59166472.

400 Danish Ministry of Defence and Defence Command Denmark. 310.

401 Danish Ministry of Defence and Defence Command Denmark. 310.

402 Danish Ministry of Defence and Defence Command Denmark. 302.

403 Department of Defence of Australia, "OPERATIONS SERIES ADDP 3.14 TARGETING," Pub. L. No. ADDP 3.14, 101 (2009), 3-3, https://usnwc.libguides.com/ld.php?content_id=11727121.

404 Department of Defence of Australia. 3-3.

405 Ministere de la Defense, "Manuel Du Droit Des Conflits Armes - France" (Republique Francaise, 2012), https://usnwc.libguides.com/ld.php?content_id=2998121.

distribution networks constitute military objectives, it emphasizes that principle of proportionality is subject to consideration when an object is used for military and civilian purposes.

Norwegian Manual stipulates that dual use objects qualify as military objects, but emphasizes that due to the attack which would likely cause loss to civilian population, proportionality assessment before commencing to the attack should be made.[406] Norwegian Manual further explains that "[a]ttacks on objects used for both civilian and military purposes (dual-use objects) will always cause harm to civilian interests. However, this does not mean that every attack on such objects is prohibited. Since an attack on such an object will always lead to civilian loss, a proportionality assessment must be carried out to ensure that the expected military advantage outweighs the expected civilian loss. This assessment presupposes, among other things, knowledge of the means and methods which may potentially be used during the attack. For example, it may be sufficient to destroy the road leading up to a bridge to hinder the enemy from using it, rather than to destroy the whole bridge. The road can be repaired quite quickly, whereas a bridge would take far longer to replace. Such attacks will often be regulated separately in specific operational plans, orders or directives."[407] Interestingly, Norwegian Manual emphasizes the inevitability of civilian damage while attacking a dual-use military objective. Despite the fact that Norwegian Manual does not stipulate the issue of the status of block of flats, but the strict language "will always cause harm to civilian interests" allows us to argue that Norway would probably not treat the whole building as military objective, or at least it would estimate collateral damage to other premises than those used by enemy forces.

We may also find certain position of international organizations such as NATO. In the aftermath of the 1999 NATO bombing campaign against the Federal Republic of Yugoslavia, the ICTY Prosecutor's office established a committee (hereinafter – ICTY Committee on NATO bombing) to assess the received allegations and advise Prosecutor whether or not there was a sufficient basis to proceed with an investigation into some or all the allegations or into other incidents related to the NATO bombing.[408] One of the incidents involved the bombing of radio relay buildings and towers. The NATO officials justified an attack in terms of dual military and civilian use to which the opponent communication system was routinely put. NATO stressed the dual-use to which such communications systems were put, describing civilian television as heavily dependent on the military command and control system and military traffic is also routed through the civilian system. NATO officials also reported that the TV building also housed a large multi-purpose communications satellite antenna dish and that radio relay control buildings were targeted to degrade opponents

406 Norwegian Ministry of Defence, Manual of the Law of Armed Conflict. 155.

407 Norwegian Ministry of Defence. 38.

408 "Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia," 2000, https://www.icty.org/en/press/final-report-prosecutor-committee-established-review-nato-bombing-campaign-against-federal.

command, control and communications network and therefore, they represent legitimate military targets.[409] Committee on NATO bombing qualified the dual-use radio relay buildings as military objectives based on the 1956 ICRC list of military objectives (which was drafted before adoption of Additional Protocols and never came into force).[410] Based on the recommendations by the Committee on NATO bombing, the Prosecutor made an exceptional public announcement that "<…> there was no <…> unlawful military targets by NATO during the campaign." The arguments laid by NATO at the time indicate that this organization perceived a multifunctional dual use building as a single military target which is somewhat relative to the position of Israel and United States.

The mentioned states and many other states, such as Italy,[411] Germany,[412] Canada,[413] hold that dual-use objects are military objectives. Such perception is generally consented,[414] and, as authors of Tallinn Manual indicated – "<…> all dual-use objects and facilities are military objectives, without qualification."[415] However, dual use buildings and especially their parts are perceived differently. Accordingly, obligation related to implementation of principle of proportionality is also interpreted differently. Some states (United States, Israel) claim that principle of proportionality should not be applied upon military targets, even if they are only partly used for military purposes. Other states (Denmark) are of similar view, however, in exceptional cases (e.g., when the attacking object is of particular importance to civilians), may treat the non-military share of an object as collateral damage.

Naturally, none of analysed manuals discuss the status of satellites in dual-use context. However, we may certainly claim that most states treat dual-use objects as military objectives by the fact of their military use. The view of states on application of proportionality principle to objects where only parts of them are used for military purposes is not unanimous. Therefore, this question is specifically addressed in "3.3.5. The status of dual-use objects with military and civilian parts."

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409 "Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia." Paras. 72-74.

410 "Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia." Para. 75.

411 "Manuale Di Diritto Umanitario," Pub. L. No. SMD-G-014, I (1991), 6, https://usnwc.libguides.com/ld.php?content_id=2998187.

412 German Federal Ministry of Defence, "Law of Armed Conflict Manual," Pub. L. No. (ZDv) 15/2 (2013), 54, https://usnwc.libguides.com/ld.php?content_id=5616055.

413 Canadian National Defence, "Law of Armed Conflict at the Operational and Tactical Levels," Pub. L. No. B-GJ-005-104/FP-021 (2011), 4-2, https://usnwc.libguides.com/ld.php?content_id=2998098.

414 Schmitt, "Targeting Dual-Use Structures: An Alternative Interpretation."

415 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 445.

2.3.3. The status of alternatively used objects

The status of alternatively used dual-use objects is least controversial because from the time they are used for military purposes, they cease their civilian status and become military objectives. However, as some military objectives sometimes acquire the status merely from their potential (under category of purpose) it may be the case when in fact an object is used only by civilians, however, its military potential for the future-use changes their present status. To emphasize the topic of "dual-use", the Author believes that ICTY *Prlić et. al.* case would illustrate it best.

In 1993, as part of an offensive, Croatian Defence Council (hereinafter – HVO) tank positioned on Stotina Hill fired at the Old Bridge of Mostar, also known as Stari Most (hereinafter – Mostar Bridge) all day long until it was unusable and on the verge of collapse, which it did the next day.[416] The ICTY Trial Chamber established that the Mostar Bridge was normally used by civilians living on the left and right banks of the Neretva as a means of communication and supply, especially for the inhabitants of the Muslim enclave on the right bank of the Neretva.[417] After the destruction of the second dangerous to cross bridge Kamenica, the local community in Donja Mahala was in complete encirclement without any contact with the left side of Mostar and without supplies of food or medicines.[418]

These established facts in the *Prlić case* found reasoning in two major aspects: whether the bridge is a military objective and whether its destruction was proportionate; secondly and more interestingly, a psychological impact on Muslim population caused by the destruction of this symbolic object.

As of to the first aspect of Mostar Bridge destruction, ICTY clearly analysed its usage purposes. ICTY Trial Chamber established facts that Mostar Bridge was regularly used by the ABiH to transport weapons, ammunition, and military materiel to Muslim soldiers.[419] Hence, ICTY considered that Mostar Bridge was essential to the ABiH for the combat activities of its units on the front line, for evacuations and for sending troops, provisions and materiel and that it was used for this purpose. Consequently, at the time of the attack, ICTY qualified the Mostar Bridge as a military target.[420] On the other hand, the Bridge had its ultimate importance to the local Muslim community. ICTY concluded that "although the Old Bridge was necessary to the ABiH considering the way in which it was used, its destruction had the immediate effect of preventing supplies from reaching the Muslim enclave on the right bank of the Neretva and seriously exacerbating the humanitarian situation of the people living there."[421]

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416 Interestingly, ICTY considered that the bridge was destroyed by the time, it has been rendered unusable, not after the collapse. Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 3, para. 1544, 1581.

417 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 2, para. 1291.

418 Ibid. Para. 1292.

419 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 2, para. 1287.

420 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 3, para. 1582.

421 Ibid. Para. 1293.

ICTY Trial Chamber held that the destruction of the Mostar Bridge has been justified by military necessity, however, the damage to the civilian population was indisputable and substantial. That lead ICTY to conclude by a majority that the impact on the Muslim civilian population of Mostar was disproportionate to the concrete and direct military advantage expected by the destruction of Mostar Bridge.[422] Hence, ICTY Trial Chamber concluded that the crime of wanton destruction not justified by a military necessity was committed.

ICTY Trial Chamber evaluated not only the material consequences of the destruction of Mostar Bridge under which a Muslim community was left isolated, but also symbolical consequences. Among other facts, ICTY established that "the destruction of the Old Bridge had a very significant psychological impact on the Muslim population of Mostar."[423] ICTY also emphasized sources which indicate that the destruction of the Mostar Bridge had a bigger political impact than a military one.[424] ICTY founded that Mostar Bridge had a serious effect on the moral of the population in Mostar, particularly on the Muslims residing in East Mostar.[425] Having found the psychological impact of the bridge to Muslim population of Mostar, the ICTY Trial Chamber concluded that the damage to the civilian population was indisputable and substantial and that the impact on the Muslim civilian population of Mostar was disproportionate.[426]

The difference between the first and second line of ICTY Trial Chamber reasoning is not only the analysis of material and symbolic consequences of the attack, but also the different understanding as to what constitutes collateral damage. In the first case, ICTY made a conclusion based on the fact that the destruction of the military objective caused disproportionate reverberating effects to Muslim community, while in the second case, the court argued that the destruction itself is disproportionate because of the symbolic value of the bridge.

ICTY Appeals Chamber reversed the decision on the ground that since Mostar Bridge was actually a military objective, there was military necessity to attack that bridge and the crime of wanton destruction was not properly qualified because of the lack of an essential *actus reus* element (having no military necessity).[427] ICTY made a conclusion that the Mostar Bridge is a military objective based on the criteria of use. The Court emphasized that the bridge was "essential" for ABiH combat and support activities. Even though the bridge was not constantly used by the military, ICTY clearly established that the criteria of "use" has a continuing effect on determination of status.

The Author partly disagrees with this view. Firstly, as was already indicated, the criteria of "use" involves present and actual activities while the criteria "purpose" – future

422 Ibid. 1584.

423 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 3, para. 1583.

424 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 2, para. 1356.

425 Ibid. Para. 1357.

426 Prosecutor v. Prlić et. al. IT-04-74-T, Vol. 3, para. 1583.

427 Prosecutor v. Prlić et. al. IT-04-74-A, Vol. 1, para. 411.

and probable activities. In Author's view, a bridge may constitute a military objective by use only in cases when it is presently used for military purposes (e.g., a column of military vehicles passing the bridge makes that bridge a military objective). If there is a pattern of use of an objective, it is possible that it would qualify as military objective on the criteria of purpose. The alternatively used dual-use objects in most cases would constitute status of military objective permanently not because they are used by the military from time to time, but because they are very likely to be used by the military again. As for the Al Firdos bunker, it qualifies as military objective only in two cases. Firstly, if the military equipment of militants was left in the bunker – the bunker was military objective by use (it was used to store military equipment). Secondly, if there was no military equipment but there was a pattern of constant military use of the bunker, it retained status of military objective (even by night when there were no combatants) by purpose, because the pattern showed probability of its future military use. Of course, this pattern should be grounded by a constant watch or other intelligence data. If the bunker was completely left out without military presence and the alternative-use pattern was broken, then it would have become a civilian object again. The question of Al Firdos bunker strike legality rests not on the status of a target, but on proportionality of collateral damage that the attack caused (for the requirements of proportionality assessment, see "3.8.4. Calculating proportionality").

In context of dual-use satellites, military commanders could hardly ever assess or even estimate the timing of signal flow and their end-users, or in other words, when exactly a satellite is used for military purposes. As long as the pattern of satellite use suggest that they are used for military purposes from time to time and that pattern shows the probability of their future use, they remain military objectives. However, such pattern of use should be proved by a reliable data. Such pattern would make all satellites alternatively used by the military and civilians military objectives by the criteria of "purpose". Weather satellites are probably most apparent example of alternatively used dual-use object because they are used only when military operations are planned or implemented and only when the knowledge of weather conditions adds to the success of achieving military goal. If, for example, the opponent forwards munitions only during the fog and a such pattern can clearly be established, relevant satellites capable of predicting fog[428] can become military objectives by "purpose". On the other hand, when a civilian satellite does not have a pattern of military use they are military objectives only as long as they are used by the military, unless there was reliable data on their future use.

2.3.4. The status of simultaneously used objects

Electrical power is essential to the modern military, especially for command, control, communications and air defence systems.[429] The attack which would cut the

428 J. A. Jayaraman, "Satellite Study Brings Clarity on Winter Fog," 2022, https://www.nature.com/articles/d44151-022-00073-x.

429 Rogers, *The Law on the Battlefield*. 75.

electrical sources to the enemy would most certainly offer a great military advantage. However, at the same time, the attack on electrical power grids would negatively affect civilian population. This is because integrated electrical grids on the one hand help the enemy to grow its military effort (e.g., produce weapons in factories) and increase defence capabilities (e.g., keep missile radar systems going), on the other hand, are essential for normal functioning of civilian population (e.g., using internet services) or even keeping existential demands (e.g., running electrical pumps to supply drinking water or to remove waste water to water treatment facilities). In that case the prudent assessment of collateral damage to civilians and civilian objects by the attack on electrical grid or any other critical infrastructure should be made. Attacks on critical infrastructure, however, have more statutory limitations than only principle of proportionality. For instance, Article 54 of IAP prohibits attacks on objects indispensable to the survival of the civilian population for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse party. Objects indispensable to the survival of the civilian population include: foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works. The term "indispensable to the survival of the civilian population" should be interpreted in the widest sense and cover the infinite variety of needs of populations in all geographical areas. The list is illustrative and indefinite.[430] ICRC IAP Commentary mentions other objects among ones mentioned in the Article 54(2), like shelter or clothing in special climate circumstances.[431] It is evident that one may not draw a definite list of these objects and qualification of such objects would depend from many circumstances. Exceptions to the general rule set in Article 54(2) are found in the forthcoming part: objects which are used to solely sustain member of its armed forces *or* if not sustenance, then in direct support of military action. In some cases, electric power transmission facilities could constitute a protective civilian object, in some – a legitimate military target. Current President of ICRC in an open debate on the protection of objects indispensable to the survival of the civilian population emphasized the importance of electricity supply: "[e]ssential services are interdependent, which means the failure of one can result in multiple services collapsing. For instance, electricity supply is needed to ensure the delivery of water and sanitation. Hospitals and schools are then dependent on a reliable supply of safe water, sanitation, and electricity."[432] However, it should be emphasized that Article 54(2) specifically prohibits attacks on civilian-used infrastructure, not military-used or dual-used. Morover, it sets a high *mens rea* threshold which requires the attack to be implemented

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430 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 655.

431 Pilloud et al. 655.

432 Peter Maurer, "Speech given by Mr Peter Maurer, President of the International Committee of the Red Cross, to the UNSC Open Debate on the Protection of Objects Indispensable to the Survival of the Civilian Population," accessed August 10, 2021, https://www.icrc.org/en/document/without-urgent-action-protect-essential-services-conflict-zones-we-face-vast-humanitarian.

with intention of denying the value for their sustenance to the civilian population *and* in order to starve out civilians, cause them move away or any other motive. It means that any attack on an object which may be indispensable for the survival of the civilian population would be permissive, if a motive to cause damage to civilians was not found or not proven. Therefore, taken 2010 Baghdad events, the electrical towers used by the military and civilian population did not qualify as object indispensable for the survival of civilian population because electricity towers were partly used by the military (directly supported military action) and a specific intention to starve or otherwise jeopardize the lives of civilians could not possibly be found.

That leads to the conclusion that simultaneously used dual-use objects, such as power grids or GNSS satellites are military objectives, but the question of targeting legality rests primarily on estimation of proportionality of collateral damage.

2.3.5. The status of dual-use objects with military and civilian parts

As mentioned, some objects are mostly civilian, however, some of their parts are used by the military. The classic example of this is a block building where only an apartment or a floor is used for military purposes whereas other parts are purely civilian. The main question is whether the whole object, such as the building, should be treated as a military object or only the specific premises used for military purposes? If the whole building was a military objective, then we could raise the question whether specific rules of targeting aimed at protection of civilians and civilian objects, especially principle of proportionality, should be applied to the premises other than militarily used. In other words, should the collateral damage to a civilian part of the building be calculated before commencing the attack or not?

Views of United States and Israel were presented previously and ICRC does not share the same view. ICRC argues that principle of proportionality should be applied independently from the status of an object. In one of the conferences, representatives of ICRC stated: "<…> while the dual-use object is a military objective, the impact of the attack on the civilian part or component of the object (such as apartments in a building whose basement is used as a munitions depot) or on the simultaneous civilian use or function of the object (such as in the case of a bridge or electricity station used for both military and civilian purposes) must also be taken into consideration in the assessment of proportionality."[433] Otherwise, a fairly minor military use would turn a civilian object into a military one and the damage cause to the remining civilian part would have no bearing on the decision to launch an attack.[434]

The view on dual-use military objects shared by ICRC is widely supported in literature. Authors of the HPCR Manual on International Law Applicable to Air and Missile

433 Laurent Gisel, "International Expert Meeting of 22-23 June 2016 - Quebec 'The Principle of Proportionality in the Rules Governing the Conduct of Hostilities under International Humanitarian Law'" (Geneva: International Committee of the Red Cross, 2016). 37-38.

434 Gisel. 37.

Warfare (hereinafter HPCR Manual) are of the view, that proportionality assessment is necessary when attacking dual-use objects: "[d]espite the fact that they [dual-use objects, Auth. Com.] have become a military objective, the decision whether or not they can be attacked depends by and large on the application of the principle of proportionality <…>. The classic example in the context of air or missile operations is an airport used both by military and civilian aircraft."[435] Authors of Tallinn Manual shared the same view as in HPCR Manual: "[a]n attack <…> on a military objective that is also used in part for civilian purposes is subject to the rule of proportionality <…> and the requirement to take precautions in attack <…>. Accordingly, an attacker is required to consider any expected harm to protected civilians or civilian objects, or to clearly distinguishable civilian components of the military objective, when determining whether an attack would be lawful."[436] Schmitt and Widmar emphasize the fact that the extent of military usage of the civilian object plays no role in determining whether it is a military objective. They note that "[d]amage to distinct civilian components of the target must be considered in the proportionality and precautions in attack analyses and may preclude attack on either or both of those bases, but the object nevertheless qualifies as a military objective once it is converted to military use, however slight."[437] Schmitt also proposed (in another piece of research) to interpret military objective dependently from the military capabilities and other circumstances which would either allow to treat a single apartment as a military objective, or would not and the whole building could qualify as military objective. He noted "[n]othing in the accepted definition of that term in Article 52 necessitates treating an entire structure as a single entity. Rather, the term "object" in the provision can be understood to refer to a distinct, tangible entity. The mere fact that distinct entities are physically connected does not preclude treating them as separate."[438] He added that treating an object as military objective "<…> should depend on the capabilities of an attacking force. If the attacker either cannot identify that part of the structure the enemy is using for military purposes or individually strike that part it can locate, then treating the entire building as the military objective, as both approaches mentioned above do, is appropriate."[439] Sassoli and Cameron indicated that if the effects on the civilian use of the object imply excessive damage to civilians, an attack on such a dual-use object may nevertheless be unlawful under the proportionality rule."[440] According to Shue and

435 The Program on Humanitarian Policy and Conflict Research at Harvard University, *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge: Cambridge University Press, 2013). 119.

436 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 445.

437 Michael Schmitt and Eric Widmar, "'On Target': Precision and Balance in the Contemporary Law of Targeting," *Journal of National Security Law & Policy* 7, no. 3 (2014): 393.

438 Schmitt, "Targeting Dual-Use Structures: An Alternative Interpretation."

439 Schmitt.

440 Marco Sassòli and Lindsey Cameron, "The Protection of Civilian Objects : Current State of the Law and Issues de Lege Ferenda," in *The Law of Air Warfare : Contemporary Issues* (The Hague: Eleven International, 2006). 57.

Wippman, "[e]ven if the object in question is indeed properly classified as a military objective, the loss of the civilian function also performed by that object cannot be allowed to disappear from all calculations as if it had never been performed."[441]

2016 ILA Group Report indicated that for the purpose of identifying whether the object fulfils the definition of military objective, it is irrelevant whether such use amounts to more than 50 percent of military use. Principles of proportionality and precautions in attack remain obviously applicable when targeting such a dual-use objects. According to ILA Group, "while the destruction of a dual-use object constitutes the destruction of a military objective, the fact that the part of that military objective which was used for civilian purposes has been destroyed obviously prevents the civilians from using it, which is thus to be counted as incidental harm."[442]

The doctrine and even most of the state practice suggest that the civilian part in the military objective should not be taken out of the proportionality test equation. In other words, a civilian part in the military objective is still a military objective, but at the same time is subjected to proportionality analysis. That suggestion, although morally justified, lacks legal reasoning, because IAP does not require measuring collateral damage of the military objective. The Author presents his view how to handle this evident misinterpretation of the law further.

2.3.6. A proposal for legal treatment of dual-use objects with military and civilian parts

Author is of the view, that neither of the views presented previously concerning treatment of dual-use objects are entirely correct. If we followed United States and Israel approach, as already presented, we would have no obligation to assess damage to the objects of civilian nature in the about-to-be attacked military objective, because we could treat those objects as military objectives. That would raise multiple problems. For example, IHL requirements to spare civilians or take military precautions could be avoided or simply ignored. Moreover, it would be easier to implement evidently disproportionate attacks on civilian object parts in the military objective and avoid criminal responsibility. If we followed the ICRC's and many publicists' approach, we would have an evidently wrongful application of law. The rule of proportionality requires to measure damage to civilian objects (Article 51(5)(b) of the IAP), not military objectives. As was already said, civilian objects are defined as all objects which are not military objectives. That means, that principle of proportionality requires only estimations of damage to civilian objects. Imposing obligation to measure collateral damage of the military objective would be evidently wrongful application of *lex scripta*.

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441 Henry Shue and David Wippman, "Limiting Attacks on Dual-Use Facilities Performing Indispensable Civilian Functions," *Cornell International Law Journal* 35, no. 3 (2002): 559–79, https://doi.org/10.1093/acprof:oso/9780198767626.003.0015.

442 International Law Association Study Group, "The Conduct of Hostilities and International Humanitarian Law: Challenges of 21st Century Warfare." 337.

Author agrees with Schmit's approach to the extent that it solves the question of misapplication of law. However, that would also mean that qualification of an object as a military objective would solely depend on the military needs and capabilities of the attacking party. The lessons learnt from the abusive application of Clausewitzian *Kriegsraison* doctrine[443] made IHL the law as it is today. Contemporary IHL is very much objectivized. Definition of military objective, which did not find its way until 1977 Addition Protocols of 1949 Geneva conventions, is also an example of IHL objectivization (see "1.3. The threshold of international armed conflict"). In Author's view, a commander should not possess a right to choose whether to treat the whole building or only a small premise as a military objective just because certain military equipment is available at the time. It is agreeable that walls, tunnels, lobbies, foundation of a building connecting its single apartment units to one structure do not legally necessitate treating that structure as a single object. Take for instance a piece of land, such as an enemy pathway in mountain range, that was discussed earlier. The pathway being a military objective does not make the whole mountain range – or more absurdly it may sound – a country, a continent or a planet a military objective, even if it does form a single unit in a larger objective. Similarly, an astronaut-combatant flying a space shuttle and docking the International Space Station (hereinafter – ISS) should not automatically render the whole ISS a military objective. An astronaut-combatant and its shuttle would still be military objectives, unless the whole ISS is used for military purposes and destruction of it would offer a definite military advantage. IHL does not define a military objective as a single structural unit. However, it should not be forgotten that IHL does not seek to prohibit attacks or immunize military objectives. It would also be absurd if we required a military commander to attack with nano-precision, e.g., a hard drive chip where the cyber-attack code is stored instead of the server, servers' room or even a building. *Ultra posse nemo obligatur.*[444]

The Author believes that in cases of confusion whether a single unit or the whole object containing that single unit is a military objective, the question should be raised and answered: the destruction, neutralization or capture of which object does exactly offer a definite military advantage? If the same advantage could be achieved by neutralization of a single unit in a larger object, then it means that a single unit is a military objective. If it is impossible to achieve the military advantage otherwise than destroying the whole object, the whole object should qualify as a military objective. It should be borne in mind that the attack should still meet the requirements of proportionality, military necessity and precautions which do require to opt a military mean or method (among many means and methods) which would cause least collateral damage to

443 Clausewitz famously define war as a "continuation of political intercourse, with a mixture of other means". Consequently, military necessity (*Kriegsraison*) to Clausewitz would justify any military expedient measure, including a contravention of otherwise defined laws of armed conflict. *See* Scott Horton, "Kriegsraison or Military Necessity? The Bush Administration's Wilhelmine Attitude towards the Conduct of War," *Fordham International Law Journal* 30, no. 3 (2007): 580.

444 A Latin legal term meaning that no one may be obliged to do something impossible or beyond capabilities.

civilians and civilian objects.[445] An apartment, not the whole building, in that case would constitute a military objective, because the military advantage is achievable through the use of selective means, not necessarily destroying the whole building. Albeit one might follow Schmitt's proposal to treat military objectives dependently from the arsenal of the available means, but the Author would like to stress that specific case of apartment-building attack, the attacker might not argue that it does not have other means than bombs destroying the whole building because it would always have certain amount of man power to destroy targets, chance to wait and target combatants leaving a building, mine the apartment, etc. Finally, in most cases the qualification of an object would not be as important as estimation of collateral damage. In either way, an attack should estimate civilian losses and damage. An apartment itself cannot make a civilian living there a legitimate military target. It can rather make that civilian an unfortunate, although legitimate part of collateral damage. Therefore, Author believes that parts of complex objects constitute military objectives only when single attacks on them can objectively be implemented.

In conclusion, a dual-use military objective constituting civilian parts should not be treated as a single military objective, unless such treatment is otherwise impossible. Such possibility should not be determined merely by the available means but rather by the possibility to distinct which part exactly constitutes military advantage. In case it is impossible to target a specific part of a satellite, as it is mostly the case with satellite sensors, the whole satellite may constitute military objective. Satellites, especially larger space structures, such as ISS, should not *eo ipso* be treated as single military objectives.

2.4. The status of unknown purpose objects

In June 2017, Russia launched the Cosmos 2519 satellite. After two months of orbiting, it popped out another satellite, known as Cosmos 2521. After three more months, another satellite separated from one of the former two.[446] Cosmos 2521 and Cosmos 2519 conducted series of engine burns to change orbits and manoeuvre in different elliptical paths. Officials of the United States government called these satellites as 'space weapons'[447] despite the fact that United States did not really know (at least officially) their purpose. What if that happened during armed conflict, could these satellites be targetable under IHL? Should they be presumed to be military objectives? Are they civilian objects?

As the text of IAP 52(2) indicates, the contribution of military objective to military action should be effective. In other words, the presence of an object should

445 IAP Article 57(3).

446 Mike Wall, "'Very Abnormal' Russian Satellite Doesn't Seem So Threatening, Experts Say," accessed July 28, 2021, https://www.space.com/41511-weird-russian-satellite-not-so-abnormal.html.

447 "Assistant Secretary Poblete Addresses the Conference on Disarmament," accessed July 28, 2021, https://geneva.usmission.gov/2018/08/14/remarks-by-assistant-secretary-yleem-d-s-poblete-at-the-conference-on-disarmament/.

undoubtfully indicate its impact on the success or importance of waging military activities. If an object does not offer any visible gain for the enemy and, therefore, the contribution of it to military action could hardly be estimated as effective, then such an object would most likely not be a legitimate military target. In that case it could be said that if the purpose of an object is unknown, the effectiveness of its contribution to military action is doubtful as well as its status as a military objective.

First of all, it needs to be clarified that IHL allows ruses of war (IAP Article 37(2). It is considered normal and legitimate practice to cover weapons, to wear camouflage, provide false information or otherwise mislead the adversary with an intent to induce him to act recklessly. The level of these "war tricks" is permitted until it constitutes an act of perfidy – an act which invites the confidence of an adversary leading to believe that he/she/it is entitled to protection with intent to betray that confidence.[448]

A very important notion is constructed in IAP Article 52(3):

"3. In case of doubt whether an object which is normally dedicated to civilian purposes, such as a place of worship, a house or other dwelling or a school, is being used to make an effective contribution to military action, it shall be presumed not to be so used."

This article has been adopted in the Conference only after long and difficult discussions. Many delegations would have wished for a more precise definition, possibly containing a list of examples of civilian objects and military objectives.[449] However, ICRC was of the view that drawing up a list of military objectives or civilian objects would have raised insuperable problems, and the ICRC therefore abandoned the attempt.[450] Authors of ICRC IAP Commentary stated: "essential step forward has been taken in that belligerents can no longer arbitrarily and unilaterally declare as a military objective any civilian object, as happened all too often in the past."[451]

The presumption is limited only in relation to the criterion of nature in the definition of military objective. That means that the presumption is not applicable for objects which have only potential to be used, as criteria nature requires so. Another characteristic evidently seen for the text of Article 52(3) is that it is applicable only when there is an issue in determining whether an object is making effective contribution to military action. The presumption does not require estimations whether the capture, damage, destruction or neutralization of an object would offer a definite military advantage. Lastly, the presumption of civilian objects is applied only to cases when there is doubt. No doubt – no need to presume.

Despite the reasonable logic of having presumption of civilian objects as it is with civilians (IAP Article 50(1)), the phrase "normally dedicated to civilian purposes" does

448 Perfidy, booby-trapping and other prohibited techniques constitute a method of warfare which is not solely an object of this Chapter.

449 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 638.

450 Pilloud et al. 638.

451 Pilloud et al. 638.

raise important questions regarding civilian objects. It needs to be stressed that Article 52(3) allows to presume an object to be civilian only if it is normally dedicated to civilian purposes or which normally does not have any significant military use or purpose.[452] The examples given in the article (places of worship, house, dwelling, school) indicate that objects which usually have strategic military value during the armed conflict should not be automatically presumed to be civilian. In other words, should a school be automatically presumed to be a civilian object but an airport or a bridge not? What if there is no data about the military potential of an airport or a bridge? What about satellites? Should a weather satellite in a geostationary orbit be not presumed to be civilian object even if there is no data about the adverse party's intent to wage a weather-conditioned attack? What about navigational satellites which likely have a significant military value in each contemporary armed conflict?

During the drafting process of IAP the relevant committee deleted the phrase "installations and means of transport", indicating the intent by the Conference that the presumption should not apply to objects which are of such a nature that their value to military action in combat situations is probable.[453] Means of transport and of communication fall into a category where their use for military purposes cannot be excluded through a presumption. Bothe's IAP Commentary suggests using a "two-pronged test" for objects unaffected by presumptions.[454] In other words, the authors of Bothe's IAP Commentary suggest to apply definition of military objective in cases when an object is not normally dedicated to civilian purposes. The issue raised during the drafting process of IAP concerned the listing of exceptions to the presumption in the text. The question was asked whether the presumption of civilian object should have an exception in areas of combat. The exception was argued on the ground that infantry soldiers could not be expected to risk their lives based on that presumption.[455] The rapporteur responsible for drafting this article recommended inclusion of the exception in the text arguing that it would help with presumption's acceptance in practice and it would be unfortunate to draft the provision which requires something which will ever be likely obeyed.[456] Despite these arguments, the exception was not included in the text by a fragile vote.[457] Authors of Bothe's IAP Commentary indicated that the "the presumption will not be invoked frequently in the situation contemplated. Combatants are not likely to entertain any doubt about the military use of buildings located in an area or land where the forward elements of opposing forces are in contact with each other,

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452 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 368.

453 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts*.

454 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts.*

455 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts.*

456 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts.* 368.

457 36 for, 12 against and 23 abstentions.

especially where they are exposed to direct fire from the ground.[458] Significantly different weight of the presumption is seen in the ICRC IAP Commentary which indicated that "<…> even in contact areas there is a presumption that civilian buildings located there are not used by the armed forces, and consequently it is prohibited to attack them unless it is certain that they accommodate enemy combatants or military objects." Put it another way, ICRC suggests that if there are no indications that an object is military objective, such an object should be presumed to be civilian. ICRC admitted that the notion of civilian object presumption largely relies upon judgement of soldiers who will have to apply it, and there are clear-cut situations when there is no possibility of doubt, but there are cases where the responsible authorities could hesitate.[459]

ICTY Trial Chamber in *Galic* case admitted that it "<…> understands that such an object shall not be attacked when it is not reasonable to believe, in the circumstances of the person contemplating the attack, including the information available to the latter, that the object is being used to make an effective contribution to military action."[460]

Dinstein emphasizes the fact the presumption comes into play only in case of doubt. Often there is no doubt at all, especially when the combatants are exposed to fire from civilian object.[461] Authors of Tallinn Manual explain that the "term 'normally dedicated' denotes that the object has not been used for military purposes in any regular or substantial way. Infrequent or insignificant use by the military does not permanently deprive an object of civilian status."[462] They give examples of internet services, civilian social media sites, civilian residences, commercial businesses, libraries, educational facilities and even factories which are 'normally dedicated to civilian purposes'.[463]

Civilian object presumption is often read with obligations related to precautions in attacks (discussed in "3.4. The status of unknown purpose objects"), one of which require the commanders or other persons making targeting decisions to do everything feasible to verify that the objective to be attacked is neither civilian nor civilian object (IAP Article 57(2)(a)(i)). Therefore, when the attacker is reasonably suspicions that a civilian object is used for military purposes, the object may be targeted only after a careful assessment of the situation and information available at the time and if there is a lack of it, request additional information.[464] The standard of knowledge of the attacker set for the presumption of civilian object requires information to be such as the

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458 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 368.

459 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 638.

460 Prosecutor v. Galic, IT-98-29-T, para. 51.

461 Yoram Dinstein, "Legitimate Military Objectives under the Current Jus in Bello," *International Legal Studies* 78, no. August 1949 (2002): 149-150.

462 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 449.

463 Schmitt.

464 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 680.

reasonable commander could conclude that the enemy is using the potential target for military purposes. A reasonable commander would not hesitate before conducting an attack despite the doubt.[465] In cases when the commander lacks information and is unable to conclude that the target is military objective, even in the absence of the means to acquire such information, should not implement an attack.[466]

In case of objects the function of which is unknown, especially when there is no information about their use, they should be presumed to have civilian status. A satellite making unexplainable maneuvers and failing to meet the status of a military objective should be presumed to be civilian. In case of Russian "matryoshka" satellites (Cosmos 2519, Cosmos 2521, Cosmos 2542, Cosmos 2543, see "1.3.1.1. Kinetic physical damage ASATs"), unless they made manoeuvres indicating their effective contribution to military action, they should be presumed to be civilian satellites. It should be borne in mind that if smaller satellites detached from the larger satellite the status of which is known to be military, civilian object presumption should not apply because smaller satellites constitute part of a military object – they are not normally used for civilian purposes. However, this fact does not preclude the attacking party from obligation to determine the status of a potential target. If an unknown function satellite maneuverer in a way to block signals from adverse parties' satellite, then, apparently, such satellite would make effective contribution to military action by preventing an opponent using its military capabilities. The destruction (neutralization, capture, damage) of such a satellite would offer a definite advantage in a way that the military functions of the former satellite would be restored. Even if the satellite starts making manoeuvres towards another satellite that could constitute threat and such a rendezvous satellite under the criteria of purpose could as well become a military objective.

The satellites or other space objects the function of which is unknown should in general be treated as civilian objects due to these two reasons: firstly, failure to meet the requirements of the "two-pronged" test and, secondly, obligation to presume an object as civilian in case of doubt if its normally used for civilian purposes.

2.5. The status of an object in the timeframe

The definition of the military objective in Article 52(2) of IAP does not indicate when exactly does a civilian object cease its status or *vice versa* – when exactly does a military object cease to be such and reverse its status to civilian. In comparison, Article 51(3) of IAP states that civilians enjoy protection, unless and "for such time" as they take a direct part in hostilities. Even though the phrase "for such time" raise legal questions for publicists,[467] it is at least indicative that the status of a person has some continuum as long as the person directly participates in hostilities. The timing of the

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465 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 450.

466 Schmitt.

467 *See* e.g. Bill Boothby, "'And for Such Time as': The Time Dimension to Direct Participation in Hostilities," *New York University Journal of International Law and Politics* 42, no. 3 (2010): 743, 746, 750.

status shift of a dual-use object is less evident, especially in cases when there is no data about the future use of an object and it cannot qualify for military objective under the umbrella of "purpose".

According to the Commentary on the HPCR Manual, "[o]nce use for a military purpose ceases, the object ceases to be a lawful target and may no longer be attacked. If there is reliable intelligence that the enemy intends to use the object again in the future, it may remain a military objective, albeit by purpose, rather than by use."[468] The mere fact that an object was used once as a military objective does not suffice to establish purpose for the future use.[469] Authors of Tallinn Manual indicate that military objectives by use can regain civilian status if they are not used by the military anymore. "[C]ivilian objects that have become military objectives through use will revert to civilian status as soon as the military use ceases. For instance, where the military temporarily (perhaps even momentarily) uses an information system normally dedicated to civilian use, particular attention must be paid to the possibility of any reconversion to civilian use."[470] Tallinn Manual gives an example where intelligence source reports that a university computer system in enemy territory is being used for military purposes. A special cyber operational team is given a task to assess the accuracy of the source information but are unable to confirm that the system is presently being put to military use. In such as circumstance, the system may not be attacked, only measures short of attack would be permissible.[471] Schmitt and Widmar recall the common practice where non-state actors use civilian objects, such as uninhabited residences for production of homemade explosives. These insurgents frequently change their locations to avoid the capture. Schmitt and Widmar argue that the residence where such explosives are being made is a military objective as long as it is so used. Once the materials and activities are moved, the residence regains protected civilian status and may not be targeted.[472] United Kingdom Manual of the Law of Armed Conflict gives a similar example. If the enemy moved a divisional headquarters into the textile factory, an attack on that headquarters would be permissible even though the factory would be fully destroyed. That is because such a factory 'in the circumstances ruling at the time' is used for military purposes. Once the enemy moved their headquarters away, the circumstances would change again and the immunity of the factory would be restored.[473]

It is important to emphasize that once the use of an object for military purposes ceases (or, for example, it is impossible to acquire data proving its military use) it may

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468 Bruderlein and Al., *Commentary on the HPCR Manual on International Law Applicable to Air and Missile Warfare*. 108.

469 Ibid.

470 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 450-451.

471 Schmitt. 451.

472 Schmitt and Widmar, "'On Target': Precision and Balance in the Contemporary Law of Targeting." 394.

473 Ministry of Defence, "JSP 383: The Joint Service Manual of the Law of Armed Conflict," Pub. L. No. JSP 383, Joint Service Publication 383 1 (2004), 56, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/27874/JSP3832004Edition.pdf.

still remain a military objective under the criteria of purpose. But there should be specific evidence of the probable military use of that object in the future. Danish LOAC Manual explicitly indicates the issue of continuity and frequency of the use of object: "[e]ven though the category ['use'] relates to the current use of an object, such use does not necessarily have to be continuous. Use is considered permanent if it is recurring to an adequate degree. It is not possible in advance to specify the exact criteria for when this is the case. For instance, how regular and frequent the use is may be taken into consideration."[474] It also adds that in some cases, frequency might mean daily, while in other cases with a high degree of regularity, a lower frequency may suffice.[475]

In Author's view, IHL does not indicate in any way that the frequency of the use of an object could somehow invoke its continuous military objective status, similarity as it is with continuous combat function making fighters combatants even in their civilian part of life. The frequency of the use of an object to contribute to military action might indicate certain tactical pattern which eventually should still be checked under the requirements of military precautions. If that pattern continues, the object may be regarded as military objective (see example of fog predicting satellite in "2.3.4. The status of simultaneously used objects"). As long as the use of an object does not offer any effective contribution to military action, it remains civilian. Determination of an object as military objective due to the frequency of its use for military purposes would eventually lead to presumption of it being a military objective. That is the opposite from what IHL requires to do. Only fact finding and fact checking should allow an object to be targeted. The frequency of use is definitely not a decisive factor of military objective qualification.

The question of temporal status shift is relevant for satellite targeting, however, it raises certain practical issues. As was indicated previously, in certain cases it is almost impossible to predict or indicate the actual time a civilian satellite is used by the military. The opponent can hardly possess information about the specific receiver on Earth receiving down-link data from a specific satellite. In common cases of GNSS satellite use, it has already been established that these satellites serve civilians and the military at the same time (see "2.3.4. The status of simultaneously used objects") and in most cases would have a continuous status of military objective. On the other hand, weather satellites may again serve as an example as their status changes throughout the time. If there was a reliable data indicating future attacks to be implemented during certain weather conditions predicted by a satellite, such satellite might become a military objective under the criteria of "purpose". If there is no reliable data that weather plays an important role in the enemy's planned attack, weather satellite would remain a civilian object. Similarly, as soon as the planned attack (under certain weather conditions) is launched, weather satellite ceases to be military objective because its destruction would not offer a military advantage anymore.

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474 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations. 300-301.

475 Danish Ministry of Defence and Defence Command Denmark. 300-301.

To conclude, the timing of the status of an object, including satellites, depends on its actual use. The military objective might reverse its status to civilian as quickly as in seconds – once it is evident that it is not used for military purposes anymore or once the information available at the time does not prove the use. The frequency of use of an object should not be a decisive factor determining its status. Precautions in attacks require to do everything feasible to verify that an object is military before commencing to the attack. The reliance merely on frequency of the use of an object is not what precautions require the commanders to do. The existence of some kind of pattern of military use of a satellite does not constitute by itself the doing everything feasible in passing targeting decisions. In cases of doubt, objects may not be presumed to be military, but otherwise. However, if in circumstances at the time information allows a reasonable commander to conclude that the specific civilian satellite is planned to be used for military purposes, it would have a continuous status of a military objective under the criteria of "purpose" as long as its destruction would offer a definite military advantage.

2.6. Status of outer space under *jus in bello*

The status of satellites under *jus in bello* is the sole object of this part of the research. However, it is equally important to contemplate on the status of outer space itself under *jus in bello* due to the following reasons. Firstly, it is widely known that some satellites serve only civilian functions (such as those observing ice thickness, e.g. ICESat-2[476] or Jason-2 measuring sea surface height[477]), some are dual-used (Global Navigation Satellite Systems, e.g. GPS, BeiDou, Galileo, GLONASS, IRNSS, QZSS) or only militarily used (military intelligence satellites, e.g. NROL-44 and other Orion satellites[478]). As was discussed before, the military object by nature might condition civilian object's status shift to the military objective. For example, an airport used by a military aircraft (the military aircraft is a military objective by nature) would lose its protective status and become a military objective by use as of the first landing of the military plane in it. Similar logic followed,[479] the question may be raised whether the use of an orbit by a military intelligence satellite renders the whole orbit (or at least part of it) a military objective? Consequently, considering that military satellites do

476 "NASA's ICESat-2 Measures Arctic Ocean's Sea Ice Thickness, Snow Cover," NASA TV, accessed August 20, 2021, https://www.nasa.gov/feature/goddard/2020/icesat-2-measures-arctic-sea-ice-thickness-snow-cover.

477 "OSTM/Jason-2," NASA, accessed August 20, 2021, https://sealevel.jpl.nasa.gov/missions/ostm-jason-2/summary/.

478 National Reconnaissance Office, "NROL-44 Launch Press Kit," accessed August 20, 2021, https://www.nro.gov/Portals/65/documents/news/Press Kits/Press Kit_Launch_NROL-44_12-9-2020.pdf?ver=Oc5pp-9UYidbf9Y2nLLGbQ%3D%3D.

479 It should be noted that the Author is not willing to compare or juxapose legally completly different regimes of an airport (as peace of land) and outer space or airspace. The Author is willing to explain the sequence under which objects might change their status.

make the orbit a military objective, it may also be argued that all parts of it inhabiting civilian satellites are targetable similarly as in the case of block buildings (albeit this view is criticized by the Author in "2.3.5. The status of dual-use objects with military and civilian parts"). Such an interpretation would eventually pose threat to civilian assets in outer space and, for some states, the potential damage to civilian assets would not even be subjected to proportionality test assessment. Secondly, for satellite targeting purposes, it needs to be established whether outer space is a civilian object and subjected to proportionality assessment. The kinetic ASAT weapon tests showed that space debris after an attack is a very serious problem posing threat not only to other assets in space but also, as a reverberating effect, damage to civilians and civilian objects on Earth (see "3.3. ASAT technologies and the concept of attacks under IHL"). The absence of such an analysis would virtually leave the targeting question, especially related to the application of principle of proportionality, unanswered. Thirdly, IHL imposes restrictions on targeting natural environment. It should be contemplated whether outer space is natural environment and what legal consequences targeting space assets might have.

2.7. Outer space as a natural environment

Natural environment is protected in multiple branches of international law and in multiple instruments of each branch. Some earthly environments which face evident threats from human activities may indisputably be 'assigned' to the notion of natural environment – ozone layer holes, rising sea levels and the issue of plastic pollution, animal extinction, soil pollution and land degradation by human made chemicals, air pollution caused by industrial facilities and transportation – are probably the most prominent examples of natural environment pollution. However, if we took outer space into consideration, it is not that evident whether it actually is natural environment, because it is distinct from Earth's environment and even portrayed to be the opposite of it. It is not evident whether we should treat space debris pollution equally as Earth's pollution. Only if we do, we could question whether the use of kinetic ASAT weapons is in line with *jus in bello* environmental preservation rules. Therefore, firstly, it is necessary to look at the definition of natural environment and how it is portrayed in international law and, secondly, contemplate on the question whether outer space is part of natural environment and space debris constitutes damage (pollution) to it.

There is no universal definition of natural environment. According to European General Multilingual Environmental Thesaurus, natural environment is the complex of atmospheric, geological and biological characteristics found in an area in the absence of artifacts or influences of a well-developed technological, human culture.[480] In another context, a definition of natural environment might differ. For instance, in the light of corporate social responsibility, it is defined as the natural, physical

480 European Environment Information and Observation Network, "GEMET," Eionet Portal, accessed August 31, 2021, https://www.eionet.europa.eu/gemet/en/concept/5498.

surroundings in which human life takes place. "Natural" means what occurs in our world outside and independently of human conduct. "Environment" is seen from the viewpoint of human beings, as it means all that surrounds human beings.[481] Various international environmental instruments defining or describing natural environment are not uniform either. The 1974 Convention on the Protection of the Environment defines environmentally harmful activities as the discharge from the soil or from buildings or installations of solid or liquid waste, gas or any other substance into watercourses, lakes or the sea and the use of land, the sea-bed, buildings or installations in any other way which entails, or may entail environmental nuisance by water pollution or any other effect on water conditions, sand drift, air pollution, noise, vibration, changes in temperature, ionizing radiation, light, etc. The 1978 Council Directive 79/117/EEC of 21 December 1978 prohibiting the placing on the market and use of plant protection products containing certain active substances (Article 2(10)) defines the environment as "[t]he relationship of human beings with water, air, land and all biological forms."[482] Under the 1979 Convention on Long-Range Transboundary Air Pollution (Article 7(d)) environment includes agriculture, forestry, materials, aquatic and other natural ecosystems and visibility.[483] The 1991 Protocol on Environmental Protection to the Antarctic Treaty protects climate and weather patterns; air and water; atmospheric, terrestrial (including aquatic), glacial or marine environments; fauna and flora; biological, scientific, historic, aesthetic or wilderness areas.[484] Under 1991 Convention on Environmental Impact Assessment in a Transboundary Context (Article 1(vii)) environment includes human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or interaction among these factors.[485] Same definition is used in the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes.[486] Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment

481 Samuel O Idowu, *Encyclopedia of Corporate Social Responsibility*, ed. Samuel O Idowu et al., *Reference Reviews*, vol. 28 (London: Springer Reference, 2014), 1735.

482 Council Directive 79/117/EEC of 21 December 1978 prohibiting the placing on the market and use of plant protection products containing certain active substances, December 21, 1978, 79/117/EEC, accessed July 20, 2022, https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:31979L0117&from=en

483 Convention on long-range transboundary air pollution, Nov. 13, 1979, 1302 U.N.T.S. 217, https://treaties.un.org/doc/Publication/UNTS/Volume%201302/v1302.pdf

484 Protocol on Environmental Protection to the Antarctic Treaty, Apr. 10, 1991, 2941 U.N.T.S. 5778, https://www.ats.aq/e/protocol.html

485 United Nations Convention on Environmental Impact Assessment in a Transboundary Content, Sept. 10, 1997, 1989 U.N.T.S. 309, https://unece.org/fileadmin/DAM/env/eia/documents/legaltexts/Espoo_Convention_authentic_ENG.pdf

486 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Oct. 6, 1996, 1936 U.N.T.S. 269, https://unece.org/DAM/env/water/publications/WAT_Text/ECE_MP.WAT_41.pdf.

describes the environment to include human beings, fauna and flora; soil, water, air, climate and the landscape; material assets and the cultural heritage. The only international treaty to include outer space in the context of environment is the 1976 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (hereinafter ENMOD Convention). It is stated in Article II of the ENMOD Convention that the "term "environmental modification techniques" refers to any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space." International Law Commission (hereinafter – ILC) considers the environment to be broader than the concept of the nature which is usually seen to be concerned only with features of the natural world itself. ILC stressed that the environment represents a complex system of interconnections where the factors involved (such as humans and the natural environment) interact with each other in different ways that do not permit them to be treated as discrete.[487] The United Nations General Assembly (hereinafter – UNGA) portrayed outer space as separate environment from Earth's environment.[488]

ICJ in the Nuclear Weapons Opinion stated that "<…> the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment. The Court also recognizes that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn."[489] The authors of ICRC IAP Commentary stated that the natural environment should be understood in the widest sense to cover the biological environment in which a population is living. It does not consist merely of the objects indispensable to survival of the civilian population. Natural environment contains foodstuffs, agricultural areas, drinking water, livestock, forests and other vegetation, as well as fauna, flora and other biological or climatic elements.[490] It has also been stated in ICRC IAP Commentary that natural environment refers to this system of inextricable interrelations between living organisms and their inanimate environment.[491] The drafters of the Tallinn Manual 2.0 used the text of ENMOD Convention to define natural environment, however, excluded outer space from it, due to "the lack of conclusive State practice and *opinio juris*."[492] ICRC holds that natural environment constitutes "the natural world together with the system of inextricable

487 International Law Commission, "Second Report on Protection of the Environment in Relation to Armed Conflicts by Marja Lehto, Special Rapporteur," UN DOC A/CN.4/728, 2019, 86.

488 United Nations General Assembly, "Resolution Adopted by the General Assembly Fifty-Fifth Session Agenda Item 83 55/122. Inernational cooperation in the peaceful uses of outer space," UNDOC A/RES/55/122. Para 34.

489 ICJ Nuclear Weapons Opinion.

490 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 662.

491 Pilloud et al. 414.

492 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 537.

interrelations between living organisms and their inanimate environment, in the widest sense possible."[493]

The vast majority of the mentioned international instruments and their commentaries attempting to give a wider understanding of natural environment do not mention outer space in their regulatory field. The text of ENMOD Convention and afore mentioned UNGA resolution implicitly indicate that Earth's natural environment and outer space are separate environments. Some of the mentioned international instruments mention Earth's atmosphere as part of natural environment. It is known that Earth's atmosphere with all its layers extends to as high as 10 000 km.[494] It is also known that the furthest Earth's satellites are located in geostationary orbit which is about 36 000 km away from the Earth. Hence, the geostationary orbit may not be considered as part of the Earth's atmosphere under these international instruments. If indeed outer space was legally treated as distinct from Earth's environment, we would have an overlap of two environments up to 10 000 km and *sui generis* regime of outer space above. More interestingly, if outer space had the status of civilian object under *jus in bello* (this question is contemplated in further chapter), it would also mean that some targeting rules such as proportionality assessment before commencing to the attack would only be applicable to the maximum extent of 10 000 km from Earth. Kinetic attacks against satellites in geostationary orbit would not be subjected to such rules (except for collateral damage for civilian objects on Earth) because there would be no objects having the status of civilian object. In that case, we could make a ridicule statement that the end of the atmosphere is not only the beginning of a physical vacuum, but also a legal one. It would make no sense to treat natural environment as such with the last molecule of air, especially bearing in mind that there is no universal definition of natural environment. Moreover, the term "natural environment" under *jus in bello* does not have to necessarily correspond to the understanding given by international environmental law. The view of the drafters of IAP on application of identical terms in the ENMOD Convention is an example to this (see "2.7.2. Protection of natural environment: the meaning of "widespread, long-term and severe" damage").

Until this moment it has been found that international instruments refer to natural environment as part of the Earth and only occasionally this part extends above the lower atmospheric layers of the Earth. The authors of Tallinn manual explicitly rejected to include outer space in the definition of natural environment due to the natural reason – the expert group had the task to analyze the *lex lata* and not the *lex ferenda*. It is reasonable to have such a finding because there has not yet been an armed conflict in outer space where outer space could have been subjected to collateral damage after a satellite attack. Such practice might not appear for decades, if ever. Opposite to the

493 International Committee of the Red Cross, "Guidelines on the Protection of the Natural Environment in Armed Conflict," 2020, 17, https://shop.icrc.org/guidelines-on-the-protection-of-the-natural-environment-in-armed-conflict-pdf-en.

494 NASA, "Earth's Atmospheric Layers," accessed September 3, 2021, https://www.nasa.gov/mission_pages/sunearth/science/atmosphere-layers2.html.

Tallinn Manual, this peace of research does not seek to define only *lex lata* but rather construct arguments and suggestions for prospective activities of the states.

First of all, neither of the sources deny outer space being part of natural environment. Even the authors of Tallinn Manual excluded outer space not for the reason that the state practice requires so (e.g., the states explicitly outlawed outer space from natural environment) but because there is no state practice. The authoritative commentators suggest the natural environment to be understood in the widest sense. The adjective "natural" refers to something existing in or derived from nature, which is the opposite of that which is be made or caused by humankind.[495] "Environment" refers to surroundings or conditions in which a person, animal, or plant lives or operates or in which an activity takes place.[496] Therefore, these perceptions followed, outer space should constitute natural environment as it not only stands for living surroundings but also any other place of activity. However, the understanding of natural environment in "widest sense" led natural environment to be perceived in various legal contexts differently. This is probably the reason international instruments did not manage to create a unilateral definition of the term. And in context of armed conflict where human activities may one day penetrate to outer space, a specific approach towards natural environment or at least different interpretation from environmental laws might be in need. Secondly, many environmental instruments emphasize interconnection of the human being and environment and the importance to have undamaged natural environment for the safety of humans themselves. Space debris pollution in orbits pose real threat to life on Earth including human beings. Nowadays, the safety and health of a modern human does not depend merely from the fauna and flora to be eaten or warmly dressed, from sun exposure, floods or particles breathed. Most people in the world do not work in agriculture[497] and their survival very much depends from the food supply chains which may break due to the global satellite navigation systems' failure, ability to buy foodstuffs which would be aggravated due to inability to use financial instruments or improper choice of land to farm.[498] Satellites and the environment where they operate condition the health of a human being similarly as in other "more traditional" cases – growing foodstuffs, breathing polluted air, eating polluted food, etc. Thirdly,

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495 "Cambridge Online Dictionary."

496 "Cambridge Online Dictionary."

497 For instance, in 2019, it was only 10 percent of the U.S. population working in Agriculture. *See* Economic Research Service of the U.S. Department of Agriculture, "Ag and Food Sectors and the Economy," accessed August 31, 2021, https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/.

498 Satellites help monitor Earth resources. Today, agricultural companies and investors do not choose a land plot blindly. Such investments entail high risks, so it is important to understand how promising the land is. That is when satellite monitoring comes in use, providing a variety of solutions for analyzing the state of agricultural fields, both nationwide and at the local level, creating historical field maps, helping to calculate field productivity. "Satellite-Based Monitoring Of Crops Condition," Earth Observing System, 2019, https://eos.com/blog/satellite-based-monitoring-of-crops-condition/.

the Earth physically interacts with outer space and outer space may not be precluded merely for the reason that the Earth is perceived as land, water and the air or outer space is perceived as the opposite to the Earth. Actually, many processes in outer space condition life existence on the Earth. Earth gravitation continues to have strong influence in outer space and is even linked with processes on Earth such as tidal currents effected by phases of moon. Photons travel through space and condition photosynthesis while electromagnetic radiation waves heat the Earth. Outer space interacts with the air constantly and it impacts the existence of biota on Earth. In Author's view, natural environment should be perceived as a non-artificial environment which interacts with other elements on Earth and eventually have impact on living species, including humans. Natural environment is the depth of the Earth, water, surface, atmospheric layers and all life in it, outer space and even objects in outer space like the Moon or the Sun, as long as their existence has an impact on conditions on the Earth.

In conclusion, outer space should be treated as part of natural environment and may not be outlawed from the general requirements of targeting and specific requirements listed in Article 35(3) and Article 55 of IAP which will further be discussed.

2.7.1. Status of natural environment under *jus in bello*

IHL does not allow the attacking party to perceive a potential target as neither military nor civilian or partly military and partly civilian. Any target is either civilian object (including civilians) or military objective (including combatants). Following this logic, natural environment should be treated accordingly to maintain the balance of IHL. In terms of targeting, natural environment is not the status *per se* but rather a legal term specifically linking *sui generis* rules of targeting and protection, similarly as in the case of medical units, hospitals or prisoner of war camps.

It is generally explicitly or implicitly recognized that natural environment is civilian in character. The United Nations Environment Programme (hereinafter – UNEP) in the report on protection of environment during armed conflict implicitly acknowledges the status of environment as civilian object by indicating that "given the non-military nature of most environmentally significant sites and protected areas, targeting such areas would be contrary to the principle of distinction <…>."[499] Similarly, according to ICRC, natural environment is civilian in character 'by default'.[500] In 2019, ILC drafted principles on protection of the environment in relation to armed conflicts.

499 United Nations Environment Programme, "Protecting the Environment During Armed Conflict: An Inventory and Analysis of International Law," 2009, 13, https://wedocs.unep.org/bitstream/handle/20.500.11822/7813/-Protecting the Environment During Armed Conflict_An Inventory and Analysis of International Law-2009891.pdf?sequence=3&amp%3BisAllowed=.

500 International Committee of the Red Cross, "Guidelines on the Protection of the Natural Environment in Armed Conflict." 19.

Principles 13[501] and 14[502] indicate the view of ILC that natural environment is a civilian object and may not be attacked, unless it has become a military objective. *Jus in bello* principles of distinction, proportionality, military necessity and precautions in attack are applicable to the natural environment with a view to its protection.[503] The ICRC Customary IHL study implicitly indicates that natural environment is civilian in nature. It states "[n]o part of the natural environment may be attacked, unless it is a military objective."[504] The summarized state practice in the ICRC Customary IHL study also indicates that States tend to apply the rules protecting civilian objects to natural environment: "[s]tate practice shows that the protection to be accorded to the environment during armed conflicts stems not only from the application to the environment of the rules protecting civilian objects, but also from a recognition of the need to provide particular protection to the environment as such."[505]

Besides the general protection with an attributed status of civilian object, natural environment is also specifically protected under IAP. Third part of Article 35, called the "Basic rule" and which opens the chapter regulating means and methods of warfare reads:

"It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment."

While the "Basic rule" intends to set the frame of all means and methods of warfare, Article 55 aims to specifically regulate protection of the natural environment. The first part of it reads as follows:

"Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population."

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501 The text reads as follows:
„Principle 13
General protection of the natural environment during armed conflict
1. The natural environment shall be respected and protected in accordance with applicable international law and, in particular, the law of armed conflict.
2. Care shall be taken to protect the natural environment against widespread, long-term and severe damage.
3. No part of the natural environment may be attacked, unless it has become a military objective."

502 The text reads as follows:
"**Principle 14**
Application of the law of armed conflict to the natural environment
The law of armed conflict, including the principles and rules on distinction, proportionality, military necessity and precautions in attack, shall be applied to the natural environment, with a view to its protection."

503 International Law Commission, "Protection of the Environment in Relation to Armed Conflicts," 2019, 250-256, https://legal.un.org/ilc/reports/2019/english/chp6.pdf.

504 Henckaerts and Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.*143.

505 Ibid. 147.

Despite the fact that neither the two mentioned articles, nor the rest of IAP indicate that natural environment has a status of civilian object, the fact that drafters of IAP placed environmental preservation rules in the chapter called "Civilian objects" indicates the civilian nature of natural environment. Many scholars also agree with civilian status of natural environment.[506] However, some scholars are of the opposite position. Heineeg and Donner argue that natural environment cannot be equated with civilian objects because IAP Article 35(3) and Article 55 are confined only to effects that are "widespread, long-term and severe" while in case of civilian objects – these effects involve all cases of disproportionate collateral damage.[507] Means and methods of warfare always have negative effects upon the environment and State parties to IAP can, therefore, not be said to have agreed upon a general protection of the natural environment against negative effects of warfare. Hence, the natural environment cannot be equated with civilian objects.[508] Secondly, Heineeg and Donner argue that the term "object" necessarily refers to material things that can be seen or touched whereas the natural environment as the sum total of different and differing natural components and processes may not be characterized as such an object.[509] Thirdly, it is hardly explainable why the drafters of IAP did not simply state that the term "civilian object" also comprises the natural environment. Instead, they agreed on two independent provisions that will protect it only against damage that are "widespread, long-term and severe".

In Author's view, the arguments by Heineeg and Donner are not entirely convincing. First of all, according to Heineeg and Donn, natural environment would have a *sui generis* status and would be protected only in so far as damage met the high cumulative test ("widespread, long-term and severe"). That would be contrary to the major requirements of IHL and dichotomic nature of it that all targetable objects are either civilian or military objectives. Article 52 of IAP clearly states that "[c]ivilian objects are all objects which are not military objectives <…>". Therefore, unless natural environment by its nature, location, purpose or use makes an effective contribution to military action and its total or partial destruction, capture or neutralization offers a definite military advantage, it is a civilian object. Additionally, as already mentioned, states tend to apply rules protecting civilian objects to natural environment and there

506 *See* Michael Schmitt, "Humanitarian Law and the Environment," *Denver Journal of International Law and Policy* 28, no. 3 (2000): 300; Jean-Marie Henckaerts, "International Legal Mechanisms for Determining Liability for Environmental Damage under International Humanitarian Law," in *The Environmental Concequences of War: Legal, Economic, and Scientific Perspectives*, ed. Jay E. Austin and Carl E. Brunch (Cambridge: Cambridge University Press, 2000): 615; William H. Boothby, *Weapons and the Law of Armed Conflict*, 2nd ed. (Oxford: Oxford University Press, 2016): 91; Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, 204; Michael Bothe, "The Protection of the Environment in Times of Armed Conflict: Legal Rules, Uncertainty, Defiencies and Possible Developments," *German Yearbook of International Law* 34 (1991): 55.

507 Wolff Heintschel von Heinegg and Michael Donner, "New Developments in the Protection of the Natural Environment in Naval Armed Conflicts," *German Yearbook of International Law* 37 (1994).

508 Ibid. 289.

509 Ibid.

are no indications from state practice that natural environment is protected insofar as the "widespread', long-term and severe" test is met.[510] Moreover, having in mind such a high threshold of protection, the protection of natural environment could hardly ever be implemented. The customary IHL, the presented views of international organizations and most authoritative bodies (such as ILC) indicate that natural environment is firstly vested with protection of civilian objects. Articles 35(3) and 55 deem to set the standard of absolute protection of natural environment or, as Droege and Tougas say, "an absolute limit to the damage that is tolerated for the natural environment."[511] Bothe notes that "<…> Articles 35 and 55 prohibit causing damage to the environment even where the environment constitutes a military objective or where the damage to the environment may be considered as not being excessive in relation to the military advantage anticipated."[512] The limits set in Article 35(3) and Article 55 of IAP may not be exceeded even if natural environment constituted a military objective whereas general principles of IHL apply in all other targeting cases. Taking IHL principles into account, the ultimate upper limit of damage to the natural environment may not be reached even when targeting military objectives (not the environment itself being a military objective), such as military satellites. If in the aftermath of the attack the probable damage to outer space might reach widespread, long-term and severe damage, such an attack might not be implemented. What is more interesting, even if somehow the attack causing widespread, long-term and severe damage was considered proportionate, it should still not be implemented because proportionality and protection of natural environment are distinct notions.

It may be concluded that natural environment and outer space respectively have the primary status of civilian object unless it constitutes a definition of military objective.

2.7.2. Protection of natural environment: the meaning of "widespread, long-term and severe" damage

The text of IAP articles 35(3) and 55 had been borrowed from at the time a one-year-older ENMOD Convention.[513] The predecessor's, ENMOD Convention's, Article 1 prohibits the parties to "engage in military or any other hostile use of environmental modification techniques having widespread, longlasting or severe effects as the

510 For more detailed state practice *see* Cordula Droege and Marie-Louise Tougas, "The Protection of the Natural Environment in Armed Conflict - Existing Rules and Need for Further Legal Protection," *Nordic Journal of International Law* 82 (2013): 26–27.

511 Cordula Droege and Marie-Louise Tougas, "The Protection of the Natural Environment in Armed Conflict - Existing Rules and Need for Further Legal Protection," *Nordic Journal of International Law* 82 (2013): 27.

512 Bothe, "The Protection of the Environment in Times of Armed Conflict: Legal Rules, Uncertainty, Defiencies and Possible Developments." 56.

513 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 386.

means of destruction, damage or injury to any other State Party." It is explained that widespread means an area on the scale of several hundred square kilometres, longlasting – a period of months (approximately a season) and severe – involving serious or significant disruption or harm to human life, natural and economic resources or other assets.[514] Bearing in mind the fact that IAP does not define these terms, the question we may raise is whether IAP's terms may be explained in analogy to the ENMOD Convention?

ENMOD Convention (which mentions outer space) does not seek to define the environment itself – it rather defines a method of warfare or hostile action. ENMOD Convention has different scope of application than IAP – it seeks to prevent environmental modification techniques as a weapon under the conditions of the so-called geophysical war, whereas IAP aims to prevent natural environment from unlawful use of means and methods of warfare under the conditions of the so-called ecological war. During the drafting process of IAP, a number of declarations were given by states emphasizing that the adjectives, especially the "long-term", should be understood differently from one explained in ENMOD Convention and "in no case interpreted in the light of different instruments of international law".[515] For instance, as was indicated that under ENMOD Convention "long-term" should be understood as "monthly" or "seasonal", some delegations in CDDH[516] suggested this term to be measured by decades or at least twenty or thirty years.[517] However, the *travaux préparatoires* of CDDH indicate the test to be so high that it would practically be applicable very rarely: "<..> it is impossible to say with certainty what period of time might be involved. It appeared to be a widely shared assumption that battlefield damage incidental to conventional warfare would not normally be proscribed by this provision. What the article is primarily directed to is thus such damage as would be likely to prejudice, over a long term, the continued survival of the civilian population or would risk causing it major health problems."[518] The prohibition set in Article 35(3) or Article 55 of IAP is valid only if the attack would cause widespread, long-term *and* severe damage to the natural environment. The drafters of IAP explicitly rejected the idea of borrowing the meaning of the terms from ENMOD Convention. Hence, the environmental preservation tests in ENMOD Convention and IAP differ not only by strictness (IAP using conjunction "and" while ENMOD Convention uses "or") but also by weight (IAP *travaux* suggestions).

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514 ENMOD Convention, Annex 1.

515 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 389.

516 The Additional protocols to the Geneva Conventions were developed and adopted in the 1974-1977 Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law (CDDH) in Geneva.

517 Federal Political Department, "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts," 1978, Vol. XV, 268-269.

518 Ibid. 269.

As of now, we could conclude that the meaning of terms used in ENMOD Convention may not be automatically transposed to the text of IAP because IAP's test allows greater damage to the natural environment by way of attacks. On the other hand, definitions made in the ENMOD Convention could at least indicate the lowest threshold of damage to the natural environment and, hopefully never, allow judges to apply analogy or interpret it accordingly. However, we still need to expose the way in which IAP's Article 35(3) and Article 55 interact with each other and to what extent does *jus in bello* protect the natural environment.

Another discussion in this topic is the legal perception of damage itself, not the amount of it. Kinetic collisions in space generate thousands of pieces of space debris due to very high kinetic energy which is directly dependent on the mass and speed of orbiting objects. Space environment is fragile since it has least abilities to repair itself. Only the atmosphere consisting of various gases, including air, can remove satellites or space debris from orbits. It is not the gravity that pulls space debris towards the Earth, but expansion of atmosphere due to the 11-year cycle of the Sun when it flares up and heats the atmosphere.[519] Due to cyclic events in the Sun, almost zero air resistance and high orbital speeds (up to 36 000 km/h or 11 km/s), space debris tends to slow down and descend over a period of years, decades, or even centuries. From the perspective of outer space, air and other molecules of gases thicken gradually. Therefore, the gradually descending object from space would eventually collide with more and more gassy particles, brake their chemical bond and eventually the friction between the fast moving object and gassy particles being so high would cause the object to burn. Today, there is an estimated 129 million objects in Earth's orbits.[520] All of these pieces form a dangerous cloud around the Earth making scientific exploration, military and civil services – all of which require placement of technologies in orbit – even harder. Space debris may impede technological development, damage civilian or military facilities, but does it really cause damage to the natural environment? Compared to pollution generated on Earth which has a direct and detectable negative effect on the Earth's biota, space pollution is different in that it does not pose a direct threat to Earth's biota. Therefore, we may raise the question whether space pollution is really "damage" constituting a breach of Article 35(3)?

Oxford Encyclopedic Dictionary defines damage as "harm or injury impairing the value or usefulness of something, or the health or normal function of a person.[521] Damage to the natural environment in general means a negative effect that impairs the normal use of it. However, there is no such requirement under Article 35(3) for the "damage" to necessarily bring negative effects to biota. Article 35(3) has intrinsic

519 J. R. Primack, N. E. Abrams, 'Star Wars Forever? – A Cosmic Perspective', available at http://physics.ucsc.edu/cosmo/UNESCOr.pdf, at 1 (visited Dec 3, 2020).

520 'Space debris by the numbers' (2019), *European Space Agency*, available at https://www.esa.int/Safety_Security/Space_Debris/Space_debris_by_the_numbers (visited Dec 3, 2020).

521 Joyce M. Hawkins and Robert Allen, *The Oxford Encyclopedic English Dictionary*, 2nd ed. (New York: Oxford University Press, 1994).

weight not measured by its contribution to human kind while Article 55 protects natural environment anthropocentrically – the damaged environment must cause negative effects on humans.[522] Thus, extreme negative effects (widespread, long-term and severe) to the environment, not humans, are sufficient to invoke a breach of IHL under Article 35(3) while the breach of Article 55 must additionally involve human casualties. The authors of the Commentary of API give an example of unexploded landmines and booby traps ("delayed-action devices") as damage to natural environment.[523] In Author's view, "damage" is a sufficiently broad term that generally encompasses a change in the environment in negative way – either because it is polluted, destroyed or even if long term risk is posed to humans due to artefacts that impede the normal use of the environment.

Notwithstanding, space debris does pose a threat to the environment on Earth. Everyday life depends significantly on space services. The destruction of navigational satellites may injure civilians,[524] not to mention the effects cause a malfunction in a satellite that monitors dams[525] or other critical infrastructure. In case Kessler's theory (see KEY NOTIONS) gained practical weight, the non-reachable, non-repairable space services could potentially cause casualties.

Besides physical obstacles to use space environment as such, there is a threat of chemical contamination due to nuclear power sources used in outer space to generate electricity which will re-enter Earth's atmosphere before radioactivity has reached an acceptable level.[526] Having no ability to enter outer space and destroy or uplift and 'prolong' the term of these cycling nuclear objects, the natural environment on Earth would also be contaminated. It is yet an example of a "more tangible" damage.

Although space debris does not pose a direct risk to humans, in the chain of certain events, it could have many negative effects to humans and environment itself. Consequently, space debris has many negative direct and indirect effects to the natural environment and should fall under the notion of "damage" mentioned in Article 35(3) of IAP.

Having determined that outer space is natural environment and space debris constitutes damage to it, we may further question why are there two regimes of its protection, namely, Article 35(3) and Article 55, are established in IAP and what legally

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522 Michael N. Schmitt, "Humanitarian Law and the Environment" (2000), 28 *Denver Journal of International Law and Policy* 265, at 313.

523 Commentary On Protocol I, *supra* note 6, at 410.

524 Dale Stephens and Cassandra Steer, "Conflicts in Space: International Humanitarian Law and its Application to Space Warfare" (2015), XL *McGill Annals of Air and Space Law* 1, at 26.

525 "Space-based dam monitoring: Reducing the probability of failure of tailings dams through the use of remote sensing data" (2018), UK Space Agency, https://www.gov.uk/government/case-studies/space-based-dam-monitoring.

526 Marieta Benkö, "The Problem of Space Debris: A Valid Case against the Use of Aggressive Military Systems in Outer Space?" in *Space Law: Current Legal Problems And Perspectives For Future Regulation* (Hague: Eleven International Publishing, 2005), Marieta Benkö and Kai-Uwe Schrogl (eds.), at 157-158.

qualifies natural environment. In other words, is natural environment a civilian object, a military objective or a *sui generis* notion being neither of them?

2.7.3. The two interpretations of damage to the natural environment

Article 35(3) and Article 55 of IAP regulating specific protection of natural environment, or to be more precise – setting the absolute limit of legally non-tolerable damage to the natural environment – at first glance look very similar. They both aim to protect natural environment and they both use words "widespread", "long-term", "severe", "intended", "expected" implicating the existence of a legal test according to which the damage to the natural environment may be qualified. On the other hand, the prudent reading of the text should indicate that Article 35(3) and Article 55 of IAP are different in scope and purpose. The major difference between these articles is that Article 55 adds "prejudice the health or survival of the population" as a condition of damage to the natural environment. In other words, it seems that Article 35(3) prohibits *all* means and methods of warfare that cause widespread, long-term and severe damage to the natural environment while Article 55 only those which cause such (widespread, long-term and severe) damage *and* prejudice the health or survival of the population. It may also be said that Article 35(3) is more general in nature while Article 55 is more specific, therefore, it may be contemplated whether Article 55 is merely a detailed version of Article 35(3). The differences in Article 35(3) and Article 55 raise an important question: does IHL protect natural environment only in so far as the damage to it prejudice the health or survival of the population or natural environment is protected *per se* even without any human related casualties or losses? Or in other words, is the aim of Article 55 to explain Article 35(3) in more detail, or make an exception to it?

The addition of "prejudice the health or survival of the population" in Article 55 provoked a two-fold interpretation of *jus in bello* environmental preservation rules.[527] According to the so called "anthropocentric" or "utilitarian" view, natural environment is protected only in so far as humans are negatively affected, or to be more precise, the whole population faces serious health risks or even the very extinction due to the environmental damage. The anthropocentric approach focuses on the environment's ability to make life possible and to take it away.[528] Therefore, under this view, the scope of protection of natural environment or, we could say, the term natural environment itself, covers only such elements of environment which offer food, shelter, fuel, clothing, natural preserves or endangered species or other similar necessary resources of

527 Tomas Marozas, "Does the Law of Armed Conflict Protect Outer Space?," Jus Cogens : The International Law Podcast & Blog, 2021, https://juscogens.law.blog/2021/01/27/does-the-law-of-armed-conflict-protect-outer-space/.

528 Michael N. Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict," *Essays on Law and War at the Fault Lines*, no. 1983 (2011): 6.

humankind life.[529] Another important notice to be made is that under the anthropocentric approach, only threats to the population, not individuals, are covered. So even though damage is widespread, longterm and severe, as long as it does not affect whole population, it is legitimate. Therefore, all other parts of natural environment which would not threaten the health and even existence of the population or threaten the health or existence of certain individuals (as opposed to the population), according to this view, is unprotected and targetable. Proponents of anthropocentric view would not consider kinetic ASAT attacks damaging natural environment by massive amounts of space debris and preventing the peaceful use of space illegitimate *per se.* Damage to the natural environment would be limited only in cases of expected danger to the health and survival of the population by a kinetic satellite attack. Having in mind the fact that under current technologies the existence (not comfort) of the whole population (not individuals) can hardly ever be threatened by a kinetic satellite attack, outer space is almost unprotected by the anthropocentrically interpreted *jus in bello* environmental preservation rules.

According to the intrinsic view, natural environment is protected *per se* because all elements of the natural environment are considered as civilian objects and protected as such.[530] Under this view, natural environment is protected even in cases when humans are unaffected by damage to it. Damage to the elements of the natural environment alone may render an attack unlawful.[531] This does not mean that while implementing attack the contribution that the environment makes to humans should be ignored, but that the value of the environment in and of itself will also be considered.[532]

Although the intrinsic view found support by the ICRC (see further), it has also been extensively criticized by some scholars. Hulme argues that the inclusion of notions protecting natural environment in the IAP chapter protecting civilian objects is criticisable as that of environmental damage being protected as "property damage".[533] Schmitt argues that anthropocentric valuation helps balancing the two-dimensional test (including only human values and military advantage) while the intrinsic approach offers a three-dimensional test adding the environment into the proportionality evaluation process. He also adds that intrinsic valuation would have the opposite effects as to the enhancement of environmental protection because intrinsic valuation

529 Michael N. Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict," *Essays on Law and War at the Fault Lines*, no. 1983 (2011): 6, https://doi.org/10.1007/978-90-6704-740-1_8.

530 Emanuela-Chiara Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment" (London, 2018), 37-37. https://www.chathamhouse.org/publication/proportionality-conduct-hostilities-incidental-harm-side-assessment.

531 Ibid.

532 Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict." 98.

533 Karen Hullme, "Armed Conflict , Wanton Ecological Devastation and Scorched Earth Policies: How the 1990-91 Gulf Conlfict Revealed the Inadequacies of the Current Laws to Ensure Effective Protection and Preservation of the Natural Environment," *Journal of Armed Conflict Law* 2, no. 1 (1997): 59.

"encourages divisiveness within the community of those who wish to ensure environmental protection during warfare."[534] Schmitt fears that intrinsic approach could lead to sacrificing human interests to environmental ones.[535] Scholars even disagree on which view – intrinsic or anthropocentric – is more dominant.[536]

Historically, IHL took a largely anthropocentric approach to the protection of the natural environment.[537] During IAP and IIAP negotiation processes, there were two views in the Working Group (responsible for drafting the text) which admitted it gave a great deal of difficulty drafting the text. There was even an informal working group (called Group Biotope) formed to offer a draft text on environmental protection. According to official records of CDDH, "[t]here were two views in the Working Group about the basic reason for the protection of the environment. Some delegates were of the view that the protection of the environment in time of war is and end in itself, while other considered that the protection of the environment has as its purpose the continued survival or health of the civilian population."[538] The incorporation of the first view into Article 35(3) and the second in Article 55 was a result of balancing interests in IAP.

The ICRC is of the view that all parts of the natural environment are civilian objects, unless they have become military objectives.[539] According to the ICRC, there is no "grey zone" in which a part of the natural environment is neither a military nor a civilian object.[540] The Author shares a similar opinion which has multiple times been expressed – there are military objectives which are defined in detail in the IAP Article 52(2) and there are other, namely, civilian objects which do not fit the definition of military objective. In response to critics of intrinsic view, treating environment as "property damage" does not raise any legal difficulties, because IAP does not require a civilian object to be material in nature. If we observed objects from deeper molecular, atomic or subatomic perspectives, there is nothing on Earth having no matter – even the air (the critics often see the issue of treatment of ozone layer as a civilian object) consists of molecules which in fact are material in nature. From the viewpoint of *jus in bello* natural environment preservation rules, it would be absurd to treat the water of

534 Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict." 98.

535 Ibid. 99.

536 Schmitt holds that utilitarian view is the prevailing one while Gillard – the opposite. *Compare* Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict." at page 6 and Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment." at page 37.

537 International Committee of the Red Cross, "Guidelines on the Protection of the Natural Environment in Armed Conflict." 20.

538 "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts." 358-359.

539 International Committee of the Red Cross, "Guidelines on the Protection of the Natural Environment in Armed Conflict." 21.

540 Ibid.

the ocean as a civilian object (and nobody disagrees with such a treatment), however, the cloud (which is the same material albeit in another state of gas) as some legally different, *sui generis* status object. The argument that civilian objects should be material in nature reflects rather a morphological issue than a legal one. In view of the Author, the term natural environment should be treated in widest possible sense and should include everything that is non-human made (but may be human-caused, such as holes of ozone layer). In that view, a civilian object may be solid, liquid, gas, it may be a particle (such as a photon), it may be a physical force itself (such as gravity), it may be an electromagnetic radiation traveling from the Sun, it may be vacuum in immense of space, as long as it is affected by or affects the planet Earth. In case of outer space, the Author believes that under the *jus in bello* regime, it should have a default status of civilian object until the Earth's gravitational pull force remains – it consists of all orbits, including the furthest geostationary orbit 36 000 km away. The rest elements of outer space for the purposes of *jus in bello* might be treated as civilian object as long as there is a proof of its significance to the Earth. Naturally, the core of the solar system and the major reason for the existence of life on Earth – the Sun – should also be treated as a civilian object.

If we looked at the text of Article 55, it is said that protection against widespread, long-term and severe damage from attacks "includes" a prohibition to conduct hostilities so as the health or survival of the population was prejudiced. Despite the unambiguous statements made by CDDH participants in the *travaux* of IAP that Article 35(3) imposes intrinsic while Article 55 anthropocentric approach to the protection of natural environment, Author believes that the use of the word "includes" in Article 55 may also allow to interpret its text as only giving an example of what the prohibition might involve among many other ways of causing damage to the natural environment and not necessarily invoking threat to the human (population). In other words, the meaning of Article 55 would not change if we changed the text of this article this way:

"Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection *among other rules* includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population. *This protection also includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause damage to the natural environment by itself without necessarily prejudicing the health or survival of the population.*"

Opinio juris shows natural environment to be rather perceived as a civilian object. For instance, Canadian Joint Doctrine Manual on the Law of Armed Conflict at the Operational and Tactical Levels (hereinafter – Canadian LOAC manual) stipulates that forests or other kinds of plant are prohibited from attacks, unless they constitute military objectives.[541] Similarily, New Zealand LOAC manual prohibits using chemical

541 Canadian National Defence, Law of Armed Conflict at the Operational and Tactical Levels, 446(4).

agents to destroy vegetation, unless it constitutes a military objective[542] and include the requirement to assess collateral damage to the natural environment when applying principle of proportionality (which requires estimation of collateral damage to civilian objects).[543] Australian LOAC manual stipulates that the "natural environment is not a legitimate object of attack".[544] German Manual on the Law of Armed Conflict (hereinafter – German LOAC manual prohibits intentional damaging and destroying of the natural environment not justified by military necessity.[545] Despite the fact that all of the mentioned states in other parts of their LOAC manuals discuss upper limits (widespread, longterm and severe) of damage to the natural environment, they all prohibit direct attacks on natural environment even without the upper limit. This may lead to conclusion that natural environment is perceived primarily as a civilian object the attacks on which are prohibited and only secondarily, an object with specific protection as indicated in Article 35(3) and 55 of IAP. In contrast, it seems that according to the French LOAC manual, natural environment is not portrayed as civilian object, but rather an object with enhanced protection (*protection renforcée au bénéfice des biens suivants*).[546] Despite the French perception of natural environment (as a *sui generis* legal regime different from civilian object) Droege and Tougas analysed the practice of states and concluded that "nothing in the practice or statements of States that would indicate that they do not consider all of the natural environment to be protected as a civilian object."[547]

Jus in bello as any other law is dynamic and constantly adopts to new forms of warfare through new ways of interpretation. Clearly, the aim of drafters of IAP was to include both, intrinsic and anthropocentric approaches towards protection of natural environment, however, it does not mean that their view prevents any other interpretation of the adopted text. One of the authoritative IAP Commentaries – Bothe's IAP Commentary – originally published in 1982, commenting Article 55 explicitly quoted the discussion on the meaning of "widespread, long-term and severe" test in the CDDH documents and in the aftermath of it stated that "the scope of adjectives ("widespread, long-term and severe") used in the Protocol was different from the scope of the terms in the (ENMOD) convention (all brackets in the sentence added by the Author).[548] After 10 years, the editor Michael Bothe in one of its articles stated: "[f]or the purpose of interpretation it would be highly dangerous to rely too heavily on the negotiating history. The comments made during the negotiations had only

542 New Zealand Defence Force, "Manual of the Armed Forces Law. Vol 4. Law of Armed Conflict.", 7.7.2.d..

543 New Zealand Defence Force, 8.6.1.b..

544 Royal Australian Air Force, Operations Law for RAAF Commanders, 5.50.

545 German Federal Ministry of Defence, Law of Armed Conflict Manual. 434.

546 Ministere de la Defense, "Manuel Du Droit Des Conflits Armes - France.", 25.

547 Droege and Tougas, "The Protection of the Natural Environment in Armed Conflict - Existing Rules and Need for Further Legal Protection.", 26.

548 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 389.

very limited examples of the then recent experience in mind, namely certain environmental damage caused during the Vietnam war. <…> [T]he evolving knowledge of environmental problems has to be taken into account. What might have not appeared to be "long-term and severe" damage twenty years ago may nowadays be considered as such."[549] He further indicates the major "flaw" of Article 35(3) and Article 55 which "<…> consists in the fact that they belong to earlier concepts of environmental protection which are more and more considered inappropriate. <…> Modern environmental law has developed to now prohibit activities which have an impact on the environment even where no specific damage to any particular element of the environment can be proved. <…> Mankind has come to realize that many human activities have disastrous consequences which were not anticipated when these activities were invented. It is thus only reasonable not to use the environment to the extreme and to leave a buffer zone for unknown impact in order to preserve the earth for future generations. <…> It may be time to rethink those provisions."[550] Among many reasons why Article 55 was included in the text of IAP, the most quoted one was the use of chemical "Agent Orange" in Vietnam war. "Agent Orange" had and still has the tremendous impact not only on the Vietnam's forests but also on the health of Vietnamese.[551]

By analogy to the ideas expressed by Bothe, we could also say that anthropocentric approach in interpretating the upper limits of damaging natural environment nowadays is too restrictive and may not in itself be the only way *jus in bello* protects natural environment. Bearing in mind the legal uncertainty of having a *sui generis* targeting rules – that natural environment is neither military, nor civilian object – the Author views that the most consistent way to interpret *jus in bello* environmental preservation rules is that natural environment has the primary status of civilian object. That leads to the conclusion that natural environment which does not constitute a military objective may never be directly attacked as any other civilian object. However, as any other civilian object, it may be exposed to dangers of war and here Articles 35(3) and 55 come into play. The "widespread, longterm and severe" damage test prohibits such damage even when a military objective is directly attacked. For instance, the use of nuclear weapon on a military objective would most certainly cause not only disproportionate damage to surrounding civilian objects, but probably also widespread, longterm and severe damage to the natural environment. Therefore, such an attack could in no way be justified even if military objective was targeted. Similarly, the intentional use of highly explosive device in outer space (such as was used in

549 Bothe, "The Protection of the Environment in Times of Armed Conflict: Legal Rules, Uncertainty, Defiencies and Possible Developments." 57.

550 Bothe. 58.

551 For detailed effects of the use of Agent Orange *see* American Public Health Association, "Agent Orange," Policy Statement Database, 2007, https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/29/13/22/agent-orange.

1962 during the Starfish Prime test)[552] which could not only deactivate surrounding satellites, but also generate a large number of space debris, could potentially breach Article 35(3) if population was not affected or Article 55 if it was. The treatment of natural environment as a civilian object under *jus in bello* is persistent with general system of IHL and state practice.[553] The anthropocentric view should only serve as an example of many outcomes that may rise due to the attack – either damage to humans or natural environment itself.

All this being said, it seems that most of kinetic ASAT attacks would breach or would be at very close breach of IHL's natural environment preservation rules. Space debris may spread thousands of kilometers, last thousands of years and have severe effects as predicted by Kessler, if a kinetic ASAT weapon was used. This would depend on the altitude of the target, as 2007 China's kinetic ASAT test showed that consequences of a target hit at an altitude of 850 km may last for generations to come.[554] According to what has been said, an attack directed at outer space, even causing less damage than widespread, long-term and severe, is prohibited because outer space is natural environment. Secondly, any other act, including an attack on natural environment, an attack on a military objective in outer space or an attack on any other object is prohibited and without exceptions, if it reaches the mentioned threshold of damage. Even if an attack would seem to be perfectly legitimate in targeting terms (well-planned, precautions taken into account, potentially proportionate and aimed at military objective)[555] it would still be illegal if widespread, long-term and severe damage to natural environment was foreseen.

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552 Some ASAT weapons are neither placed in orbits, nor kinetically interact with the target, however, may cause destructive effects due to their explosive power. During the 1962 Starfish Prime test when United States exploded a 1,4 megaton hydrogen bomb at an altitude of 400 km above Pacific Ocean. At least six British, American and Soviet TV broadcast and telecommunications satellites were disabled by the wave of the blast, not to mention the effects in Hawaii, 1400 km away from the test, where streetlights went off, burglar alarms went on, telephone microwave link was shut down. James Conca, "Can Nuclear Power Plants Resist Attacks Of Electromagnetic Pulse (EMP)?," Forbes, 2019, https://www.forbes.com/sites/jamesconca/2019/01/03/can-nuclear-power-plants-resist-attacks-of-electromagnetic-pulse-emp/?sh=5619c55270cb.

553 Droege and Tougas, "The Protection of the Natural Environment in Armed Conflict - Existing Rules and Need for Further Legal Protection."

554 Brian Weeden, "Anti-Satellite Tests in Space— The Case of China," Secure World Foundation, 2013, https://swfound.org/media/115643/china_asat_testing_fact_sheet_aug_2013.pdf.

555 This is a hypothetical example having almost no practical reasoning as the Author believes that an attack causing widespread, long-term and severe damage to the natural environment may almost in case be proportionate because of the so great collateral damage. Nevertheless, proportionality is also determined by military advantage and in an attack cause such damage to the natural environment, but at the same time had greater military advantage (which the Author cannot think of), the attack may be proportionate.

2.8. Concluding remarks regarding targetability of satellites and the status of outer space

This chapter has disclosed under what conditions a satellite would constitute military objective and what is the status of outer space. The former question has been raised as a direct goal of this thesis while the second – as an indirect one. Estimations on what conditions satellites may be legally qualified as military objectives under *jus in bello* is the question directly evoked by the primary goal of the thesis – to disclose satellite targeting limits. On the other hand, the status of environment where satellites operate – the outer space – is equally important because methods of warfare require the attacking party to take into account not only the status of the target itself, but indirectly – the status of the surroundings of the target. If these objects in the area of the target or the area itself are civilian, proportionality assessment and other targeting requirements discussed in further chapters should be taken into account. This is because *jus in bello* limits the collateral effects to the civilian objects caused by the attacks on military objectives.

Most of the satellites are dual-use objects, however, that does not necessarily make them targetable. An object which makes no contribution to military action or its contribution is vague or not evident would fail to meet the requirements of legitimate military objective. Hence, non-functional military satellites, such as USA-193 (destroyed in 2008 during the Operation Burnt Frost), would not offer any contribution to military action and would not qualify as military objectives. Similarly, the satellites which may hardly ever be used by the military, such as those monitoring sea levels, in ordinary circumstances should not be targeted. However, certain conditions indicating satellite contribution to military action being met, they may be targetable. As it is often the case in any branch of law – legal qualification is circumstantial. In case of satellites, their status might shift from protective to targetable and *vice versa* dependently from information available at the time. The circumstances under which satellites are military objectives are summarised further.

Satellites may be targetable due to their nature, location, purpose or use.

Targetable satellites by nature are those owned or possessed by the military. A classic example of this – military reconnaissance satellites. It needs to be emphasized that determination of military objective by nature requires an object to be functional, because permanently non-functional object could not make any contribution to military action. Therefore, non-functional military satellites might be considered as military objectives by nature, however, they would not be military objectives due to the loss of their function and inability to make effective contribution to military action. In that case, the loss of functions should be permanent or non-repairable, because repairable satellites could still be operative in the future and constitute a military objective by nature. Abandoned satellites would also constitute military objectives because of their potential to be reused as such in the future. Military objectives by nature might be movable, such as satellites, or immovable, such as satellite communications facilities.

Objects which are not used by the military and are not purposed for the military

might qualify as military objectives by location. A civilian satellite blocking targetable military satellite or a civilian satellite blocking signals of another satellite necessary for the conduct of military action might serve as an example (although, it may equally be so under criteria of use as such satellite clearly disrupts signals). In context of outer space as a location, it is hardly imaginable under which circumstances a satellite could qualify for military objective by location of outer space, bearing in mind that outer space as natural environment has the primary status of a civilian object. If indeed under some circumstances outer space was considered as a military objective (e.g., hypothetically, as a location inhabiting military satellites), it should still not be too widely determined – an orbit or part of it, but not the entire outer space would be a military objective. A too broad interpretation of military objective by location, such as treating entire outer space as military objective, could potentially make many civilian objects legitimate targets and, eventually, *jus in bello* avoidable.

The criterion purpose reflecting the intended future use of a satellite is hardly applicable because the future military use of a satellite is difficult to find. A civilian satellite would be targetable only when information available at the time indicated probability of its effective contribution to the military action. The information, or intelligence data, may often be misleading and should be evaluated with due care. Weather satellites have potential in planning military operations, however, the mere potential is not sufficient to render them military objectives. Only if information available at the time indicated that the planned military activity is conditioned by certain weather, a satellite might be targetable. The available information about the potentially targetable object should be evaluated with due care and if it is fragmented, has questionable reliability or otherwise inaccurate, should be supplemented with alternative sources. Information does not need to be absolutely correct, but should allow a reasonable commander to make reasoned conclusions relative to targeting. There should be clear indications that the enemy intends to use the satellite for military purposes in the future. Such information should be objective and indicate a specific satellite but not, for example, the whole constellation. A satellite or any other object is targetable only if it individually fulfils conditions of a military objective.

The criterion use reflects the present function of a satellite – the current employment of it by the military. From the moment a satellite is being used by the military it becomes a military objective. For example, it is known that JDAM missiles are guided by signals of Global Positioning System satellites[556] and from the moment such missile is launched, at least the four[557] closest Global Positioning System satellites become military objectives.

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556 John A. Tirpak, "Precision: The Next Generation," Air Force Magazine, 2003, https://www.airforcemag.com/article/1103precision/.

557 A place of an object in geographical plane is determined by its receiver getting a combination of at least three closest GPS satellite signals. However, by taking a measurement from a fourth satellite, the receiver avoids the need for an atomic clock installed in each of the GPS satellites. Thus, the receiver uses four satellites to compute latitude, longitude, altitude and time. *See* Federal Aviation Administration, "Satellite Navigation - GPS - How It Works," 2021, https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/gps/howitworks/.

Many satellites are dual-use which means that they are simultaneously used by civilians and the military. Multiple number of states, international organizations and scholars treat dual-use objects as military objectives. Some technologies may have a civilian and military parts similarly as is the case with apartments used for military purposes in a civilian building. If that was the case, a single military unit of an object would constitute a military objective while the rest of an object would be subjected to proportionality assessment. However, if the military unit is integrated in a way that it is impossible to distinct it from civilian unit or otherwise attack – the whole object could be treated as a military objective. For example, if a specific chip installed in the satellite made some of that satellite functions militarily useful, that chip would clearly constitute a military objective, however, targeting specific chip would probably be impossible, therefore, the satellite itself could be considered as a single military objective. It is not required for the satellite to be directly used in the military operation to be targetable. The indirect relationship with combat action, such as weather forecast, might render weather satellites targetable, however, their contribution to the military action needs to be effective. In other words, a weather satellite may be attacked only in so far as there is data showing that weather forecast is essential for enemy's military operations to be successful (effective).

Even if satellite makes an effective contribution to the military action by its nature, use, purpose or location, it is not a military objective unless the destruction, capture or neutralization of it offers a definite military advantage. Destruction of a satellite means rendering it permanently inoperative, capture – taking control of a satellite and neutralization – making a satellite temporarily inactive. A definite military advantage means concrete and perceptible military advantage – the opposite of hypothetical and speculative advantage. Military advantage may be measured in context of a single attack, or an overall military operation. A prediction of specific damage due to the attack on the satellite should be taken into account while estimating a general military gain by that damage. Military advantage after satellite attack needs not to be immediate, nor material in nature.

Satellites which functions are not known, should be presumed to be civilian objects. The frequent change of satellite status does not automatically mean that it may be targeted. The frequency or the pattern of the military use of an object does not render it military objective by use, but may render it by purpose. In any case, satellites (as any other objects) may not be presumed to be military objectives. They may only attain the status of a military objective if the circumstances ruling at the time indicate their present or future military use.

Outer space and its parts, like orbits, is natural environment and should be treated as a civilian object. Space debris generated by a kinetic satellite attack is damage to the natural environment. Therefore, principle of proportionality should be applied when attacking satellites and estimations made of how outer space may be affected by the satellite attack.

3. SATELLITE TARGETING PRINCIPLES

3.1. General remarks

Satellites are targetable only if they constitute military objectives. It has been shown in the previous chapter that there are many peculiarities related to the qualification of the status of satellites. In some cases, the mere fact that a satellite is possessed by the military may still not make it a military objective. In other cases, a satellite possessed by civilian entities could be legitimately targeted because of its military potential. The fact of possession does not automatically render a satellite targetable, thus its status mostly depends on circumstances ruling at the time. More to add, even if under specific circumstances a satellite passes a two-pronged military objective test, there are plenty additional legal constraints to be followed prior launching an ASAT attack. The focus of this chapter is given to the rules of targeting, applicable after successful satellite identification as a military objective.

Some of the targeting rules are customary (e.g., principle of distinction),[558] some are conventional (e.g., definition of mercenaries)[559]), some are not directly applicable to satellites as objects (e.g., prohibition of *maux superflus*, see "3.6. Unnecessary suffering"), some are so hard to implement that they might need a *sui generis* interpretation (e.g., determination whether specific satellite's signals are only used for civilian purposes). Many *jus in bello* targeting rules are underpinned with each other and sometimes pose a real challenge to be disclosed separately. Hence, to some extent, it is unavoidable to have referenceable language in this chapter. Some rules are claimed to have attained customary status, but it is difficult to contemplate which rules and to what extent are customary or merely conventional.[560] State practice related to satellite targeting in times of armed conflict is very limited. If sometime in the future such practice evolves, no one could deny the possibility that the States would treat the law governing military space activities differently from the existing *corpus juris* and shift customary law in different direction, similarly as happened with the threshold of international

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558 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law Customary International Humanitarian Law Volume I: Rules* (Cambridge: Cambridge University Press, 2009), 3-6.

559 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law Customary International Humanitarian Law Volume I: Rules* (Cambridge: Cambridge University Press, 2009), 391-393.

560 For instance, ICRC customary IHL study indicates by Rule 6 that civilians are protected against attack unless and *for such time* as they take a direct part in hostilities. The customary status of the notion "for such time" has been challenged by some authors, especially bearing in mind that *opinio juris* on this question is diverse. Therefore, even though the ICRC customary IHL study has been conducted for a decade by some of the most prominent experts of IHL, it does not in itself mean that the identified customary IHL may not be challenged. For more discussive aspects see Yoram Dinstein, "The ICRC Customary International Law Study," *Israel Yearbook on Human Rights* 36 (2006): 1–15.

armed conflict (see 1.3. "The threshold of international armed conflict"). Having no goal to analyse the extent of customary IHL, the Author is using the widest in scope to date study of customary IHL drafted by ICRC.[561] By this research the Author does not seek to frame or speculate on future state activities, but rather disclose what kind of conduct of states is unquestionably imperative, what kind of conduct is desirable and what would be highly questionable.

Even though targeting rules described in this chapter form an essential part of the research, they may not be disclosed, contemplated and understood correctly, unless a definition of the notion "attacks" under *jus in bello* is provided. The reason to this is that targeting rules are limited to a specific form of military action – attacks – and all activities failing to reach the threshold of attacks are not subjected to targeting rules.

3.2. The notion of "military operations"

It should firstly be mentioned, that IAP uses various terms to define military-like or hostile activities of war – operations[562], military operations[563], military operation preparatory to an attack,[564] attacks,[565] indiscriminate attacks,[566] hostilities,[567] act of hostility,[568] hostile act,[569] hostile action,[570] warfare,[571] method of warfare,[572] violence,[573] act of violence,[574] threat of violence,[575] military engagement,[576] reprisal.[577] IAP article 48 named "Basic rule" embodying general targeting requirements and codifying principle of distinction reads as follows:

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561 Henckaerts and Doswald-Beck, *Customary International Humanitarian Law Customary International Humanitarian Law Volume I: Rules*.

562 1977 IAP, Arts.: 48; 99(1).

563 1977 IAP, Arts.: 3(b); 39(2); 51(1); 51(7); 56(2); 57(1); 57(4); 58(c); 59(2)(d); 60(1); 60(6).

564 1977 IAP, Arts. 44(3); 44(4).

565 1977 IAP, Arts.: 12(1); 12(4); 27(2); 28(1); 31(2); 39(2); 41(1); 42(1); 42(2); 44(3); 44(5); 49; 51(2); 51(6); 51(7); 52(1); 52(2); 54(2); 55(2); 56(1); 56(2); 56(3); 56(5); 57; 58; 59(1); 85(3).

566 1977 IAP, Arts.: 51(4); 51(5); 85(3)(b).

567 1977 IAP, Arts:. 31(4); 33(1); 33(2)(a); 33(2)(b); 34(1); 34(2); 40; 43(2); 44(3); 45; 47(2)(b); 47(2)(c); 49(4); 51(3); 56(5); 60(2); 61(a); 67(1)(e); 73; 77(2); 77(3).

568 1977 IAP, Arts.: 8(a); 8(b); 53(a); 59(2)(c); 62(3)(b).

569 1977 IAP, Arts.: 41(2)(c); 42(2).

570 1977 IAP, Art. 56(5).

571 1977 IAP, Arts.: 49(3); 55(1);

572 1977 IAP, Arts.: 35; 36; 54(1); 55(1).

573 1977 IAP, Art. 75(2)(a).

574 1977 IAP, Arts.: 17(1); 49(1).

575 1977 IAP, Art. 51(2).

576 1977 IAP, Art. 44(3)(a).

577 1977 IAP, Arts.: 20; 51(6); 52(1); 53(c); 55(2); 56(4).

"In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives."[578]

As seen from the text of Article 48 of IAP, the term "operations" is used to define the architecture of the principle of distinction. Since in some instances IAP uses the term "military operations", the use of the term "operations" without "military" may mislead to think that principle of distinction is applicable even outside the military context. The use of the notion "military operations" also raises ambiguous thoughts. It is well known, that militaries use not only the kinetic armed force against the opponent, but also "soft" military means, as intelligence, signal jamming or military influence operations (also called propaganda, information warfare, psychological warfare, information operations) and public security ensuring measures (search, curfew, identity checking, transport control, telecommunications control, other legitimate human rights limitations). Therefore, the use of the term "operations" when constructing principle of distinction could also mean that the "soft" military power may not be directed at civilians, civilian population and civilian objects. State practice indicates that it is universally acceptable to limit certain human rights when military necessity requires so. Does that mean that principle of distinction is either misinterpreted or disobeyed?

The term "operations" used in the text of Article 48 of IAP encompass only "military operations", not other. Authors of ICRC IAP commentary explained: "[t]he word "operations" should be understood in the context of the whole of the Section; it refers to military operations during which violence is used, and not to ideological, political or religious campaigns. For reasons which have nothing to do with the discussions in the Diplomatic Conference, the adjective "military" was not used with the term "operations", but this is certainly how the word should be understood. According to the dictionary, "military operations" refers to all movements and acts related to hostilities that are undertaken by armed forces."[579] Authors of Bothe's IAP Commentary similarily explain that the term operations should be understood "in the context in which it is used" and that it involves not merely military operations but "those aspects of military operations that are likely to cause civilian casualties or damage to civilian objects."[580] Opinions of authors of both IAP commentaries reflect state practice which suggests that non-hostile activities against civilians during war is common and permissible.

Opinio juris of states (including international organizations where the states participate in) show that psychological operations directed against civilians are legitimate. The NATO Allied Joint Doctrine states that "<…> there is a requirement to influence and shape perceptions through the judicious fusion of both physical and psychological

578 1977 IAP. Art. 48.

579 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 600.

580 Bothe, p. 325

means. In order for NATO forces to do this effectively, they need a detailed understanding of the situation, its human context, and the other agencies that could help to achieve a desired outcome."[581] The significance of psychological operations directed against civilian population is as well reflected in NATO's Allied Joint Doctrine for Psychological Operations which stipulates that the planned psychological operations are designed to create a supportive atmosphere and a willingness to cooperate among the parties in conflict and civilian populations.[582] United States Law of War Manual indicates that non-violent measures against civilians, such as the search, detention, collecting intelligence, interrogation, restriction of movement and propaganda is permissible as long as they are militarily necessary.[583] Norwegian Manual of the Law of Armed Conflict states that civilians may be targeted if the movement or activity of the military is not related to hostilities.[584] The Law of War Manual of France stipulates that psychological operations are not regulated by the law of armed conflict and they are lawful even if they target civilians.[585] Germany[586] and Canada[587] similarly allow psychological warfare techniques against civilians.

The legality of psychological warfare is not challenged by other academics.[588] Schmitt emphasizes the significance of civil-military operations intended to influence civilian population being "key elements of contemporary military campaigns."[589] According to Dinstein, psychological warfare is legal not only when spreading disinformation but also when inciting enemy combatants to rebel, mutiny or desert.[590] Fleck

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581 NATO, "ALLIED JOINT PUBLICATION 01(D) - ALLIED JOINT DOCTRINE," Pub. L. No. AJP-01(D) vii (2010), 2-10, https://www.cmdrcoe.org/download.cgf.php?id=13.

582 NATO, "ALLIED JOINT DOCTRINE FOR PSYCHOLOGICAL OPERATIONS," Pub. L. No. AJP-3.10.1(A), 1 (2007), 1-3–1-4, https://info.publicintelligence.net/NATO-PSYOPS.pdf.

583 Department of Defense, Department of Defence Law of War Manual (Updated), 188-189, https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190.

584 Norwegian Ministry of Defence, Manual of the Law of Armed Conflict, 14, 199-200, https://usnwc.libguides.com/ld.php?content_id=47416967.

585 Ministere de la Defense, "Manuel Du Droit Des Conflits Armes - France." Le droit des conflits armés ne règlemente pas les opérations psychologiques en tant que telles. <…> Les opérations psychologiques non violentes ne sont pas interdites, et sont licites même lorsqu'elles visent des civils.» 68 https://usnwc.libguides.com/ld.php?content_id=2998121.

586 Federal Ministry of Defence of the Federal Republic of Germany, "Humanitarian Law in Armed Conflicts. Manual" (1992), 474, https://usnwc.libguides.com/ld.php?content_id=2998107.

587 Canadian National Defence, Law of Armed Conflict at the Operational and Tactical Levels, 7-4, https://usnwc.libguides.com/ld.php?content_id=2998098.

588 Yoram Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict* (Cambridge: Cambridge University Press, 2004), 240; Dieter Fleck, *The Handbook of International Humanitarian Law*, 2nd ed. (Oxford: Oxford University Press, 2008), 231;

589 Michael N. Schmitt, "Rewired Warfare: Rethinking thbe Law of Cyber Attack," *International Review of the Red Cross* 96, no. 893 (2014): 189–206, 193, https://doi.org/10.1017/S1816383114000381.

590 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, 240.

notes that propaganda with the intent to influence the adversary's civilian population and to work on the members of the opposing armed forces has been an important means of warfare.[591]

Indeed, if we looked at the textual targeting prohibitions of IAP, we would see that they are mostly related to a specific form of military operations – attacks. For instance, Article 44 of IAP requires combatants to distinguish themselves from the civilian population while they are engaged in an *attack* or in a military operation preparatory to an *attack*; Article 51(2) prohibits *attacking* civilian population and individual civilians; Article 51(4) prohibits indiscriminate *attacks*; Article 51(5)(b) prohibits disproportionate *attacks*; Article 51(6) prohibits *attacks* against the civilian population or civilians by way of reprisals; Article 51(7) prohibits shielding military objectives from *attacks*; Article 52(1) prohibits *attacking* civilian objects; Article 55(2) prohibits *attacks* against the natural environment by way of reprisals; Article 56 prohibits *attacks* against works or installations containing dangerous forces; Article 57 and Article 58 list requirements for precautions in *attacks* and precautions against the effects of *attacks*; Article 59 prohibits *attacking* non-defended localities. Other rules articulating special protective status, such as protection of medical units, medical aircraft, *hors de combat*, persons parachuting from an aircraft in distress (Articles 12, 27, 28, 41, 42) also prohibit making them objects of attacks. In fact, the introductory IAP Article 48 to the chapter of civilian protection is followed by Article 49 specifically dedicated to define the term attacks. In comparison, articles that do not use this notion are unrelated to the specific targeting rules *per se,* but general requirements or explanations. For example, Article 3 uses the term military operations to describe the limits of the IAP application. Article 51(1) establishes general protection of civilian population and individual civilians against dangers arising from military operations, however, "to give effect of this protection", subsequent parts prohibit specific acts, such as *attacks* against civilians or indiscriminate *attacks*. Other articles make clear distinction between attacks and military operations indicating the former to be part of the latter.[592] For instance, Article 57 lists requirements of precautions in attacks but in the first part includes general obligation to take constant care and spare civilian population, individual civilians, and civilian objects during conduct of military operations.

This allows us to conclude that targeting rules are primarily applied only to those military operations which fall under the legal notion of "attacks". In contrast, other restrictions, such as imposition of duty to protect civilians, prohibition of shielding or duty to constantly care and spare the civilians apply to broader notion of "military operations".

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591 FLeck, *The Handbook of International Humanitarian Law*, 231.

592 See Art. 39(2); Art. 44(3); 44(5);

3.3. ASAT technologies and the concept of attacks under IHL

Having determined that targeting rules apply to attacks, it needs to be explained what does this legal notion mean and which activities can be considered as attacks.

Article 49(1) defines attacks as "acts of violence against the adversary, whether in offence or in defence". The key word in this definition separating attacks from other hostilities is "violence." Oxford English Dictionary defines violence as "the exercise of physical force so as to inflict injury on, or cause damage to, persons or property; action or conduct characterized by this; treatment or usage tending to cause bodily injury or forcibly interfering with personal freedom."[593] The traditional understanding of "acts of violence" came from authoritative Bothe's IAP Commentary (authors Bothe, Partsch and Solf were involved in drafting the IAP) which indicates that these acts denote physical force.[594] Similarly, ICRC IAP Commentary connotes attacks as combat action which endangers a person and not necessarily impose immediate destructive effects. The ICRC IAP Commentary recalled the opinion of drafters of IAP that laying land mines constitutes an attack in itself without necessarily causing explosion.[595] Indeed, there is no question that the use of kinetic force amounts to violence and, accordingly, to attacks. However, modern military technologies do not always rest on the kinetic force, but may as well cause devastating effects merely by, for example, an electrical impulse. In this context, major ASAT technologies are presented further, the description of which is essential for legal analysis because results of it might differentiate dependently from types of ASAT technologies.

ASAT weapons and weapon systems vary dependently from their use, capabilities, destructive effects or even their location. Accordingly, there may be multiple ways to classify these weapons. One way to present the topic of ASAT technologies is to classify them on various grounds and describe each one accordingly. In many cases such classification would serve no scientific purpose. For instance, ASAT weapons may be placed on Earth or in a certain orbit. This would lead to classifying these weapons by the characteristic of their place. However, in context of *jus in bello*, the location of a weapon does not evidently serve a legal purpose, if any, because targeting rules are not conditioned by a place of a weapon. On the other hand, the potential effects that ASAT weapons are capable of causing are relevant for determining activity as an attack and legality of it. The precision, collateral damage, kinetic force and the way in which a weapon is used are only a few characteristics that military lawyers must take into account. In case of ASAT technologies, the Author believes it is best to classify

593 John Simpson and Edmund Weiner, *The Oxford English Dictionary*, 2nd ed. (Oxford: Oxford University Press, 1989).

594 Michael Bothe, Karl Josef Partsch, and Waldemar A. Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*, 2nd ed. (Leiden: Martinus Nijhoff Publishers, 2013): 329.

595 Claud Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Geneva: Martinus Nijhoff Publishers, 1987): 603.

them by type of damage. This is because the appearance of physical damage is relevant for determination of armed attacks – the essential state of hostility to which targeting rules apply. All ASAT weapons by type of causable damage may be classified into two groups: ASAT weapons which cause physical damage (hereinafter – Physical damage ASATs) and ASAT weapons which cause non-physical damage (hereinafter – Non-physical damage ASATs).

Physical damage ASATs strike a satellite directly or detonate a warhead in close proximity to it or its ground station. The most common example of this is kinetic physical damage ASATs. These ASAT weapons can be launched from the ground to space (also called direct ascent ASAT weapons), may be stationed in orbits (also called co-orbital ASAT weapons) or aimed to target ground stations.[596]

The direct ascent ASAT weapons are most savage not only because they physically destroy a satellite but also because they generate space debris which, in the aftermath of the attack, may have secondary impact with other orbiting objects. The first operational American antisatellite weapon system was known as Program 505. This ASAT system was developed by the United States Army, using Nike Zeus missiles, which were originally designed for an antiballistic missile (ABM) role. The system was operative only for a year when United States Air Force's antisatellite weapons system, known as Program 437, was chosen over the former in 1964.[597] Program 437 used Thor missiles with nuclear warheads which could be launched into space accurately enough to destroy a hostile space-based weapon system or satellite.[598] During the 1970s, the United States Air Force began to develop a concept for a follow-on antisatellite weapons system that would not use nuclear warheads and could be launched from an aircraft. The ASAT program was called Project Spike.[599] A missile launched from F-106 aircraft would release a terminal homing vehicle which would be guided by a missile on a trajectory to intercept the targeted satellite. Project Spike did not enter the development stage, but its technology and design provided the basis for a later American antisatellite development program known as the Air-launched ASAT. Air-launched ASAT program involved a F-15 fighter aircraft releasing a missile with miniature homing vehicle which used a long wavelength infrared sensor to acquire its target, steer toward it, fire small rocket motors and destroy the target using its kinetic energy.[600] On September 13, 1985, the Air-launched ASAT successfully destroyed an orbiting satellite. During this test, an F-15 fighter aircraft fired an ASAT weapon upwards from an altitude of 11,6 kilometers hitting an obsolete Air Force satellite, P78-1, which was orbiting 555

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596 Todd Harrison et al., "Space Threat Assessment 2022," 2022, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/220404_Harrison_SpaceThreatAssessment2022.pdf?K4A9o_D9NmYG-2Gv98PxNigLxS4oYpHRa.

597 Angelo, *Frontiers in Space: Satellites*. 133.

598 Angelo. 133.

599 "Project Spike," Global Security, accessed August 22, 2022, https://www.globalsecurity.org/space/systems/spike.htm.

600 Angelo, *Frontiers in Space: Satellites*. 134.

km above the Pacific Ocean. That was the first and so far, the last successful kinetic ASAT test which launched kinetic kill vehicle from the aircraft.

Other successful kinetic direct-ascent tests involved land-based launch systems. China's 2007 ASAT weapon system targeted a satellite at an altitude of 850 km that generated 3037 trackable pieces of debris, with scientists estimating more than 32 000 smaller untracked pieces. The cloud of debris was scattered over an area at altitudes from 175 km to 3600 km and it was calculated at the time that 79 percent of it would remain in orbit until about the year 2108.[601] In 2013, a piece of Chinese space junk from 2007 collided with a Russian laser ranging satellite creating even more debris.[602] In 2008, United States tested an ASAT which targeted a satellite at the 200 km altitude. The blast generated 174 pieces of trackable debris, most of which re-entered the Earth's atmosphere within 40 days. The final peace of debris re-entered the atmosphere 18 months after the test.[603] India's 2019 ASAT test targeted a satellite at a height of about 280 km, leaving 270 trackable debris which was estimated by India's officials to decay in just a few months (45 days)[604], however, they were predicted to remain in the orbit until July 2020.[605] Analysis of the India's ASAT test show that fragments from the blast moved from 300 km to as high as 2265 km orbits.[606] Although this ASAT test targeted a satellite in low Earth orbit, according to NASA calculations, chances of hitting International Space Station (hereinafter – ISS) increased by 44 percent over a ten-day period following the test.[607] Despite all calculations, India's public media claimed that by 2022, all debris from this test has decayed and completely disintegrated.[608] The most recent direct-ascent physical damage kinetic ASAT test was conducted by Russia in late 2021.

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601 B. Weeden, '2007 Chinese Anti-Satellite Test: Fact Sheet' (2010), *Secure World Foundation*, available at https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf (hereinafter Weeden 2007).

602 J. Johnson-Freese, *Space Warfare In The 21st Century: Arming The Heavens* (2017), at 18.

603 P. Glenshaw, 'The First Space Ace: F-15 vs, Satellite' (2018), *Air And Space Magazine*, available at https://www.airspacemag.com/military-aviation/first-space-ace-180968349/;

N. Petrucii, 'Reflections on Operation Burnt Frost' (2017), *Airpower Strategy*, available at http://www.airpowerstrategy.com/2017/03/05/burnt-frost/;

J. Wolf, 'U.S. satellite shootdown debris said gone from space' (2009), *Reuters*, available at https://www.reuters.com/article/us-space-usa-china/u-s-satellite-shootdown-debris-said-gone-from-space-idUSTRE51Q2Q220090227.

604 S. Miglani, 'India says space debris from anti-satellite test to 'vanish' in 45 days' (2019), *Reuters*, available at https://www.reuters.com/article/us-india-satellite-idUSKCN1R91DM.

605 S. Miglani.

606 V. Akhmetov, V. Savanevych, E. Dikov, 'Analysis of the Indian ASAT test on 27 March 2019' available at https://arxiv.org/ftp/arxiv/papers/1905/1905.09659.pdf

607 S. Gallagher, 'Space junk nightmare - India ASAT test debris poses danger to International Space Station, NASA says' (2019), *Ars Technica*, available at https://arstechnica.com/tech-policy/2019/04/india-asat-test-debris-poses-danger-to-international-space-station-nasa-says/.

608 Amitabh Sinha, "India's Space Debris Back to Levels before 2019 Anti-Satellite Test, Lowest among Major Space-Faring Nations," The Indian Express, 2022, https://indianexpress.com/article/india/indias-space-debris-2019-anti-satellite-test-7862796/.

It has been estimated that the test generated up to 3 000 trackable and 12 000 lethal non-trackable debris fragments which spread as high as 9 000 km. The reentry of Russian test debris will take more than 20 years.[609]

Not all kinetic ASAT weapons use land-based rocket launch systems to destroy satellites. Some ASAT weapons are placed into orbit and approach the target when necessary. These maneuvers are commonly called rendezvous or proximity operations (RPOs)[610] and these ASAT technologies are called co-orbital weapons. They are hard to identify as weapons, since they do not make any maneuvers and look like regular satellites. However, at some point they change their normal orbital positions toward another orbiting spacecraft. From 1960s through the 1980s, the Soviet Union developed co-orbital ASAT technologies. These technologies involved a satellite placed into orbit which would track a target, make maneuvers and relatively quickly approach the target. The attacking satellite would then detonate and destroy the target. After about a decade of testing, the system was declared operational in 1973.[611] As practice shows, co-orbital ASAT technologies are commonly applied for spying or reconnaissance operations, albeit having ability to collide with other space assets. Last decade alone, Russia conducted multiple rendezvous close-proximity operations. In 2017, Russian officials announced that a small satellite designated Cosmos 2521 has separated from Cosmos 2519 and was intended for to do inspection of another satellite.[612] In late 2019, Russia launched a military payload to conduct space surveillance. Later that year, Russia declared that Cosmos 2542 released a small subsatellite named Cosmos 2543. For couple of days, Cosmos 2542 remained in close-proximity with Cosmos 2543, when it started maneuvering reaching 590 km altitude where it was able to observe a classified United States intelligence satellite, USA 245.[613] Next year, a third unknown purpose object (object number 45915) separated from Cosmos 2543. United States declared that the release of object 45915 is a test of anti-satellite weapon.[614] In 2015, Russian satellite in geostationary orbit (hereinafter – GEO) has become notorious for skirting the line between acceptable and unacceptable behavior in orbit when it comes to rendezvous and proximity operations. Olymp-K (known as Luch) positioned itself between two satellites operated by a private United

609 Jim Cooper, Dan Oltrogge, and Sal Alfano, "Ruminations and Analysis on a Russian ASAT," COMSPOC, 2021, https://comspoc.com/News/NewsDetail?BlogID=42&Slug=ruminations-and-analysis-on-a-russian-asat.

610 Harrison et al., "Space Threat Assessment 2022."

611 Tyler Way, "Counterspace Weapons 101," Aerospace Security, 2019, https://aerospace.csis.org/aerospace101/counterspace-weapons-101/.

612 Brian Weeden, "Russian Co-Orbital Anti-Satellite Testing," swfound.org, 2022, https://swfound.org/media/207373/swf-russia-co-orbital-asat-may-2022.pdf.

613 Weeden.

614 U.S. Space Command Public Affairs Office, "Russia Conducts Space-Based Anti-Satellite Weapons Test," U.S. Space Command, 2020, https://www.spacecom.mil/Newsroom/News/Article-Display/Article/2285098/russia-conducts-space-based-anti-satellite-weapons-test/.

States communications company Intelsat[615] by approximately 150 km distance.[616] Such close approach allowed the observation or inspection of the Intelsat satellites, interception of communications to the satellites.[617] In 2017, Olymp-K maneuvered again towards French-Italian military satellite, Athena-Fidus.[618] French Minister of Armed Forces accused Russia of espionage.[619] In 2020, Russian satellite began maneuvering towards United States reconnaissance satellite coming as close as 160 km. Despite the fact that no harm was made, this was the first time when the United States military has publicly identified a direct threat to a specific American satellite by an adversary.[620]

Some kinetic ASAT weapons are neither placed in orbits, nor kinetically interact with the target, however, may cause destructive effects due to their ultra-high explosive power. Starfish Prime test (discussed in "2.7.3. The two interpretations of damage to the natural environment") is an example of this. Other kinetic ASAT weapons are designed as regular land to land weapons as they target not satellites but their ground control stations.[621]

Not all kinetic ASAT weapons use physical force to cause physical damage. For instance, lasers do not physically interact in a way as missiles do, however, they may melt down microchips or other components responsible for sending or receiving signals and in this way make a satellite defunct. The common example of non-kinetic ASAT weapon is DEWs use deposing energy on the target. These are devices that produce a beam of concentrated electromagnetic energy or atomic or subatomic particles which incapacitate, damage or destroy enemy equipment, facilities and (or) personnel.[622]

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615 Mike Gruss, "Russian Satellite Maneuvers, Silence Worry Intelsat," Spacenews.com, 2015, https://spacenews.com/russian-satellite-maneuvers-silence-worry-intelsat/.

616 Kaitlyn Johnson, "Rendezvous and Proximity Operations," 2020, https://www.jstor.org/stable/resrep26047.7.

617 Johnson.

618 Thomas G. Roberts, "Unusual Behavior in GEO: Luch (Olymp-K)," Aerospace Security2, 2021, https://aerospace.csis.org/data/unusual-behavior-in-geo-olymp-k/.

619 Reuters, "La France Accuse Moscou d'espionnage Sur Le Satellite Athena-Fidus," Reuters, 2018, https://www.reuters.com/article/france-russie-satellite-idFRKCN1LN1WJ-OFRTP.

620 W. J. Hennigan, "Exclusive: Strange Russian Spacecraft Shadowing U.S. Spy Satellite, General Says," Time1, 2020, https://time.com/5779315/russian-spacecraft-spy-satellite-space-force/.

621 Harrison et al., "Space Threat Assessment 2022." 3.

622 There are three major types of these weapons: lasers, microwave radiation emitters and particle beams. Lasers can cause damage to electronic devices with intense heat on the device's sensor screens or by the sudden surge of electricity produced by the laser's energy. Lasers can cause melting, vaporization or mechanical effects due to vaporization. Microwaves are another type of electromagnetic radiation, but have much longer wavelength and much lower frequency than light. Microwaves can severely damage or destroy electronic components of the mechanism, especially receivers which are designed to detect, amplify and process microwaves at the same frequency. They do it by overloading the components with electrical current. Particle beam weapons use directed flow of atomic or subatomic particles to cause target damage, including melting or fracture of target material. Chairman of the Joint Chiefs of Staff, "DOD Dictionary of Military and Associated Terms," 2021, 63, http://www.jcs.mil/Doctrine/DOD-Terminology/; Philip E. Nielsen, *Effects of Directed Energy Weapons* (NDU Press, 1994). 89.

DEWs can cause physical damage without kinetic use of force. In some cases, damage may be permanent (e.g., melting down components of satellite), in other – temporal (e.g., temporarily dazzling satellite's imaging sensors). Russia has claimed it has created a plane-mounted laser which is capable of hitting satellites.[623] The United States military is investing significantly in various DEW weapons applications, some prototypes of such weapons are being developed for tactical use, to defend against missiles, artillery and drones.[624] Other countries also invest heavily in laser technologies for satellite defence.[625]

Lastly, some ASAT weapons neither use kinetic energy, nor cause kinetic destructive effects on a satellite. These least visible and least destructive type of ASAT technologies are commonly called satellite signal interference technologies. Satellites communicate with each other and send signals to Earth through electromagnetic waves.[626] Any disruption of these waves, like radiation, reradiation (transmission of electromagnetic radiation received from an initial wave), or reflection of electromagnetic energy could lead to loss or disruption of signal either from Earth towards satellite (called up-link) or from satellite to Earth (called down-link).[627] The intentional interference with an adversary's radio frequency transmissions to or from a satellite is often called signal "jamming". Up-link jamming occurs when an unauthorized user transmits a different signal than authorized users (such as tv broadcasters) onto the same satellite on the same frequency and both signals combine and make a signal that a receiver cannot decode, or in other words, the desired signal is lost. The interfered, or decreased signal is being re-transmitted to users who receive an indecipherable noise. The other type of jamming – down-link jamming – is terrestrial, because jamming targets are ground satellite services, the satellite suffers no interference, nor would users outside the range of jammer.[628]

Jamming satellite signals is beneficial for one party to the conflict because the loss of a signal could lead to navigation errors of the opponent, disrupt military communication network, prevent from sending accurate intelligence information or other images. Although jamming is a temporal activity which does not cause a permanent effect on the satellite, however, there may be a cascade effect of jamming due to signal loss. Satellite guided smart missiles could miss military targets and increase chances of

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623 Patric Tucker, "Russia Claims It Now Has Lasers To Shoot Satellites," Defense One, 2018, https://www.defenseone.com/technology/2018/02/russia-claims-it-now-has-lasers-shoot-satellites/146243/.

624 Weeden, "Anti-Satellite Tests in Space— The Case of China."

625 Joshua Pusaner and Saim Saeed, "France lists laser weapons, surveillance satellites in space defense plan", Politico, 2019, accessed August 3, 2022, https://www.politico.eu/article/france-lists-lasers-weapons-surveillance-satellites-in-space-defense-plan/.

626 Ashley Campbell, "How Do Satellites Communicate?," NASA, 2017, https://www.nasa.gov/directorates/heo/scan/communications/outreach/funfacts/txt_satellite_comm.html.

627 Chairman of the Joint Chiefs of Staff, "DOD Dictionary of Military and Associated Terms." 69.

628 Brian Weeden and Victoria Samson, "Global Counterspace Capabilities: An Open Source Assessment," 2020, https://swfound.org/media/206957/swf_global_counterspace_april2020_es.pdf.

disproportionate collateral damage. Jamming might affect civilian air traffic and cause plane crashes.

Another term met in non-kinetic ASAT context is spoofing. Satellite spoofing is the broadcast of false signals with the intent that the attacked satellite's receiver will misinterpret them as authentic signals.[629] Put it simply, spoofing is satellite signal interference which makes the receiver believe it is at a false location. During spoofing attack, a radio transmitter located nearby a target sends misleading GNSS signals into the target's receiver. Spoofing GPS coordinates could affect law enforcement agencies failing to receive information about incidents and their location.

China and Russia have a range of technologies specifically designed to jam GPS signals. For instance, China installed military jamming equipment on Spratly Islands in South China Sea.[630] In 2016 Russian Ministry of Defence announced to install GPS jammers in 250 000 phone towers to reduce enemy missile and drone accuracy in the event of large-scale conventional war.[631] Before and during 2018 NATO exercise GPS jamming affected not only the military, but also civilian air traffic navigation over Finland and Norway territories. Norway claimed to have proof that the jamming was caused by Russian military.[632] In February, 2020, Russian jamming system Krasukha-4 deactivated control systems of hostile drones in Syria's Hmeymim air base.[633] Krashuka-4 is also capable of countering early warning and control systems and could even cause damage to enemy radar electronic warfare and communications systems.[634] The same system was captured by Ukraine military in the beginning of full scale conventional Russian invasion to Ukraine in 2022.[635] A widely known spoofing attack happened in Iran with a drone belonging to the United States, when Iran supposedly spoofed GPS coordinates to make the drone land in Iran's territory, not the base in

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629 For technical analysis on spoofing and difference from satellite jamming see Seyit A Camtepe and Ernest Foo, "A Survey and Analysis of the GNSS Spoofing Threat and Countermeasures", *ACM Computing Surveys* 48, no. 64 (2016): 1-31..

630 Michael R. Gordon and Jeremy Page, "China Installed Military Jamming Equipment on Spratly Islands, U.S. Says," The Wall Street Journal, 2018, https://www.wsj.com/articles/china-installed-military-jamming-equipment-on-spratly-islands-u-s-says-1523266320.

631 Aleksey Ram et al., "Minoborony Zaglushit GPS s Vyshek Sotovoy Svyazi Минобороны Заглушит GPS с Вышек Сотовой Связи," IZ.ru, 2016, https://iz.ru/news/628766.

632 "Norway Says It Proved Russian GPS Interference during NATO Exercises," Reuters, 2019, https://www.reuters.com/article/us-norway-defence-russia-idUSKCN1QZ1WN.

633 Linda Kay, "Russian Electronic Warfare System Brings Down Hostile Drones in Syria," Defense World, 2020, https://www.defenseworld.net/2020/02/03/russian-electronic-warfare-system-brings-down-hostile-drones-in-syria.html.

634 OE Data Integration Network, "1RL257E Krasukha-4 Russian 8x8 Mobile Multifunctional Jammer," n.d., https://odin.tradoc.army.mil/mediawiki/index.php/1RL257E_Krasukha-4_Russian_8x8_Mobile_Multifunctional_Jammer.

635 Alia Shoaib, "Ukraine Captures One of Russia's Most Advanced Electronic Warfare Systems, Which Could Reveal Military Secrets, Reports Say," 2022, https://www.businessinsider.com/russian-hi-tech-warfare-system-seized-ukraine-hold-military-secrets-2022-3.

Afghanistan as was programmed.[636] United States is capable of jamming its owned GPS networks so as the opponents did not use their services.[637] That actually happens more than 20 times per month.[638] More recently, in April 2022, Russia has been claimed to jam GPS satellite signals in Ukraine disabling navigation, mapping and other important services from use. As a result of Russian attacks, Ukraine suffered from a lack of internet connectivity. A private company SpaceX shipped thousands of Starlink terminals to the country to provide an independent set of internet infrastructure. It has been also claimed that some Starlink terminals near conflict areas were jammed for several hours at a time.[639]

These are only few examples of ASAT capabilities which already take an important role in current military operations. In context of all present ASAT capabilities, it should be borne in mind that the mentioned examples are probably a tip of an iceberg because major ASAT capabilities are likely to be classified. Despite what is sealed behind the governmental secrecy, all ASAT technologies have legally relevant characteristics that should be emphasized here – they may cause physical damage permanently disabling a satellite and (or) requiring a repair, or they may cause non-physical damage which may only temporarily disable satellite signals which eventually may be restored. These characteristics are essential for determining whether such activity falls under the notion of attacks and consequently invoke application of sophisticated targeting rules.

Before analysing the notion of "attacks", few hypothetical examples may be given to underpin the notion of attacks with ASAT activities. First example: communication satellite is jammed and military units in the field face challenges communicating with military headquarters. Second example: few of the Space Based Infrared System satellites' infrared sensors are blinded by an enemy ASAT laser causing some of the launched missiles by an opponent undetected and anti-missile defence ineffective. Third example: a cyber-attack against a satellite ground control system is launched and satellite is no longer controlled by the military possessor. All three examples show that functional disruption of military objects may be equally militarily beneficial as the use of kinetic force causing destructive effects. Therefore, it is important to clarify whether the use of non-kinetic force, or more precisely, whether non-destructive effects of the use of force, qualify as an attack and, eventually, are subjected to targeting rules.

Many scholars agree that the type of force used in attacks is irrelevant. According

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636 Adam Rawnsely, "Iran's Alleged Drone Hack: Tough, but Possible," Wired, 2011, https://www.wired.com/2011/12/iran-drone-hack-gps/.

637 Space and Missile Systems Center Public Affairs, "Counter Communications System Block 10.2 Achieves IOC, Ready for the Warfighter," Space Force Los Angeles Air Force Base, 2020, https://www.losangeles.spaceforce.mil/News/Article-Display/Article/2111775/counter-communications-system-block-102-achieves-ioc-ready-for-the-warfighter/.

638 A Report Of et al., "Space Threat Asssessment 2018," 2018, 4, https://aerospace.csis.org/space-threat-assessment-2018/.

639 Elizabeth Howell, "Russia Is Jamming GPS Satellite Signals in Ukraine, US Space Force Says," Space.com, 2022, https://www.space.com/russia-jamming-gps-signals-ukraine.

to Dinstein, violence means acts that cause injury to human beings – either loss of life or other harm, whether physical or mental – or destruction of (or damage to) property. The violent essence of an act must be understood in term of consequences rather than of the act triggering these consequences.[640] Schmitt notes that the definition of attacks in Article 49(1) sufficed in an era in which attacks were carried out almost exclusively by kinetic means, for such means are by nature violent. Cyber operations complicated matters as they are useful militarily without generating destructive or injurious effects.[641] According to Schmitt, there is no normative or practical logic for distinguishing between a cyber operation that damages objects or injures people and a kinetic operation having precisely the same effects.[642] Droege admits that violence is commonly understood as the traditional entailment of kinetic force, however, she indicates that nowadays there is a broad agreement that violence does not refer to the means of the attack, but the consequences of the military operations.[643] Mavropoulou sees the consequence-based approach of attacks as obvious and indubitable.[644] The Tallinn Manual similarly stipulates that the law of armed conflict applies to the targeting of any person or object during armed conflict irrespective of the means or methods of warfare employed.[645] Many types of weapons including chemical or biological ones may cause devastating effects without any relevant kinetic force. For instance, ICTY in *Tadić* case stressed that the use chemical weapons constitute inhumane attacks.[646] The Author agrees with the consequence-based approach on attacks simply because there are no arguments why should a kinetic or non-kinetic mean be legally differentiated if they may cause exact same effects. An aircraft may have an accident due to the loss of satellite signal which may happen either because a satellite is destroyed by a kinetic kill vehicle, transmitter melted by a laser or a signal is jammed. The means used are irrelevant as long as they cause such effects that are prohibitive under IHL. Otherwise, commanders making targeting decisions and willing to escape targeting obligations could do so by using merely non-kinetic means. This would be contrary to the purpose and goal of IHL which primarily is to limit negative effects of hostilities on those who do not participate therein or negative effects on objects which have no military value.

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640 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 1.

641 Michael N. Schmitt, "The Law of Cyber Warfare: Quo Vadis?," *Stanford Law & Policy Review* 25 (2014): 294.

642 Michael N. Schmitt, "The Law of Cyber Targeting," *Naval War College Review* 68, no. 2 (2015): 14.

643 Cordula Droege, "Get off My Cloud: Cyber Warfare, International Humanitarian Law, and the Protection of Civilians," *International Review of the Red Cross* 94, no. 886 (2013): 556.

644 Elizabeth Mavropoulou, "Targeting in the Cyber Domain: Legal Challenges Arising from the Application of the Principle of Distinction to Cyber Attacks," *Journal of Law & Cyberwarfare* 4, no. 2 (2015): 23–93.

645 Michael N. Schmitt, ed., *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017): 414.

646 International Criminal Court for the Former Yugoslavia, Prosecutor v. Dusko Tadic, DECISION ON THE DEFENCE MOTION FOR INTERLOCUTORY APPEAL ON JURISDICTION (1995). Para 120, 124.

Accordingly, the notion of "acts of violence" as used in Article 49(1) of IAP should be interpreted to mean acts invoking violent effects.

During the drafting of Tallinn Manual process the expert group faced challenges of how to interpret the violent effects of attacks in cases when cyber operations do not produce any violent consequences under the meaning of IAP's Article 49, but merely disruptions or interference with the functionality of the targeted object. Some members of the expert group did not agree that the loss of functionality of a targeted object does constitute an attack while the majority did.[647] Those who agreed with that logic emphasized that loss of functionality qualifies as damage only if restoration of functionality requires replacement of physical components. Some of the experts in the majority argued that interference with functionality extends to situations in which reinstallation of the operating system or of particular data is required in order for targeted cyber infrastructure to perform the function for which it was designed.[648] There were also a few experts who thought that it is immaterial how an object was disabled – the loss of usability of cyber infrastructure constitutes damage. Some of the drafters even stressed that even if no physical damage was caused, in certain cases having large-scale adverse consequences (such as disrupting all email communications throughout the country) could constitute an attack. However, the majority did not approve such a wide interpretation extending IHL.[649] Notwithstanding various disagreements on definition of attack, the expert group agreed that not all cyber operations qualify as attacks. Cyber operations which involve cyber espionage, jamming of radio communications or television broadcasts – do not qualify as attacks. In this context, expert group generally agreed that cyber operations that merely cause inconvenience or irritation to the civilian population do not rise to the level of attack, although they cautioned that the scope of the term "inconvenience" is unsettled.[650] In contrast, despite the fact that authors of San Remo Manual did not stipulate on the notion of violence and borrowed definition of attacks from IAP, they specifically indicated interception, visit, search, diversion and capture as measures short of attack, while blockade as a method of warfare.[651] The end-listed examples which do not constitute an attack could indicate that authors of San Remo Manual view the loss of functionality of an object (such as jamming radio signals used to communicate with other vessels) constituting an attack. However, such a claim would be exaggerated, because authors of San Remo Manual did not discuss this question in detail.

ICRC interprets the notion of "attacks" more widely than the expert group of Tallinn Manual. ICRC considers that not only operations which are expected to cause death, injury or physical damage constitute attacks, but also which are designed to

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647 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 417.

648 Ibid.

649 Ibid. 418.

650 Ibid.

651 HIIHL, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, ed. Louise Doswald-Beck (Cambridge: Cambridge University Press, 1995), 31-39.

disable an object through kinetic or cyber means.[652] ICRC stated that "the reference to "neutralization" in the definition of military objective (Article 52 of Additional Protocol I) would be superfluous if an operation aimed at impairing the functionality of an object (i.e., its neutralization) would not constitute an attack. <…> overly restrictive understanding of the notion of attack would be difficult to reconcile with the object and purpose of the rules on the conduct of hostilities, which is to ensure the protection of the civilian population and civilian objects against the effects of hostilities."[653] Hence, according to ICRC, the cyber operation directed at making civilian network dysfunctional, such as targeting electricity, banking, communications or other network, should constitute an attack because of potentially severe consequences of such operations for the civilian population. In other words, the loss of functionality of an object caused through military means suffices for such an activity to be regarded as an attack – an object which lost its functionality because of the attack is considered damaged.

Boothby rather upholds the position of the drafters of Tallinn Manual. He notes that "the better view is that the functionality has been damage if restoring it presupposes some repair activity. If repair in the form of system or essential component replacement, is required in order to restore functionality, then damage has been done with the consequence that the cyber event that precipitated that state of affairs can properly be described as a cyber attack."[654] Upholding ICRC's position, Dörmann indicates that the term "neutralization" used in the definition of military objective as a possible result of an attack means that the mere disabling of an object, such as shutting down of the electricity grid, without destroying it should be qualified as an attack as well. According to Dörmann, the fact that computer network attack does not lead to the destruction of the object attacked is irrelevant.[655] Schmitt criticizes Dörmann's view as dispensing with the requirement for damage destruction, death or injury for an action to qualify as an attack. Schmitt notes that Dörmann's approach poses the risk for an attack to be over-inclusive, since all DDoS (directed denial of service) attacks which merely cause inconvenience, such as blocking a television broadcast or university website, would fall under the notion of attacks. Schmitt argues that there is no state practice supporting the view that causing inconvenience during armed conflict is prohibited under IHL. On the contrary, inconvenience and interference with the daily

652 International Committee of the Red Cross, "32nd International Conference of the Red Cross and Red Cressent: International Humanitarian Law and the Challenges of Contemporary Armed Conflicts," in *32IC/15/11* (Geneva, 2015): 41.

653 Ibid.

654 William H. Boothby, "Where Do Cyber Hostilities Fit in the International Law Maze?," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (The Hague: T. M. C. ASSER PRESS, 2014): 62.

655 Knut Dörmann, "Applicability of the Additional Protocols to Computer Network Attacks," *Paper Presented in International Expert Conference on Computer Network Attacks and the Applicability of International Humanitarian Law (Stockholm)*, 2004, http://www.961.ch/eng/assets/files/other/applicabilityofihltocna.pdf.

lives of civilians, as well as psychological operations directed against the civilian population are common result of armed conflict. Schmitt criticized Dörmann by saying his "proposed remedy goes too far."[656] The term "neutralization" according to Schmitt may not hold as an argument in defining attacks, because it primary defines military objectives and not whether an attack is being conducted or contemplated – not how or witch consequences.[657] In Droege's view, Schmitt's criticism is not convincing since it fails to acknowledge that by the term "neutralization", as explained in the Bothe's IAP Commentary, it was meant to encompass an attack for the purpose of denying the use of an object to the enemy without necessarily destroying it.[658]

Both positions are criticisable. The position that holds damage, destruction, injury or death as a necessary characteristic of an attack (by Schmitt, Boothby, majority of Tallinn Manual's expert group) does not entirely reflect the purpose of IHL which is protection of civilian population and individual civilians against the effects of attacks. An attack on the object rendering it useless but not physically damaged in some cases could have an equally negative effect on civilians preventing them the use of such an object. For instance, the kinetic attack on a power grid and cyber-attack preventing operation of a power grid would have the same result – loss of the ability to use electricity by civilians. The kinetic attack on a positioning satellite and a non-kinetic attack jamming signals of that satellite would also have same negative results on civilians. The lower threshold of damage under that view, as indicated, is the loss of functionality of an object in a way that it needs to be repaired. If a repair is not needed and system restart would suffice to make an object operative again – such damage would not be considered as invoked by an attack, even though an object remains dysfunctional. According to this view, a laser weapon temporarily blinding a satellite and causing civilian casualties (e.g., due to the crash of autonomous vehicle) does not constitute an attack while kinetic destruction of the same satellite causing same effects would do. The requirement of "repair" as a characteristic of damage is neither found in state practice, nor the intent of the drafters of IAP. It is merely a derivation of the meaning of the word "violence" which in itself may be explained in many ways. Moreover, it is questionable why "repair" constitutes only a replacement of an essential element to restore functionality of an object and not system restart, programming, the launch of an antivirus scan, etc. The need to take steps to revitalize functionality of an object may also be considered a repair. It may often be the case that reprogramming the code of the system so as it functioned again may be harder and require more resources than physically replacing a broken part. The need of physical replacement of an element of a dysfunctional object to qualify such a disruption as an attack is unreasonable and very limited. In addition, the Author finds

656 Michael N. Schmitt, "Cyber Operations and Jus in Bello: Key Issues," *International Law Studies* 87 (2013): 95.

657 Ibid.

658 Droege, "Get off My Cloud: Cyber Warfare, International Humanitarian Law, and the Protection of Civilians." 558.

Schmitt's explanation concerning the use of word "neutralization" in the definition of a military objective hardly convincing. To begin with, the definition of military objective uses not only the term "neutralization" but also "capture". Therefore, not only the loss of functionality of an object due to an attack should be discussed, but also the situations when there is absolutely no material change of an object (and its functions), but merely the question of who is able to control these functions. One may capture an object without any violent effects to it. Schmitt says that the term "neutralization" is used to define military objective but not an attack. Following that logic, a commander making a decision to attack should firstly evaluate whether his planned attack by which an object would be neutralized would offer a definite military advantage (in this way, he/she would determine whether a target is a military objective), and secondly, he/she should not follow his plan to neutralize that object, but should seek for damage so as his act constituted an attack. Or put it differently, a commander should have an obligation to spare civilians if his plan is to cause damage to an object, but should not have obligation to spare civilians if he would choose not to damage the object, but to capture it safe or neutralize its functions. The authors of IAP chose to define a military objective by listing ways of military action against them (destruction, capture or neutralization) which offer a definite military advantage. The pretention that only one way of causing damage, namely, the destruction, falls under the term of "violence" dismantles the system of IAP leaves definition of military objective with useless notions of "neutralization" and "capture". In this context, the above given example of laying landmines could be reiterated. The ICRC IAP Commentary indicated that laying landmines constitutes an attack even without ever exploding. Such an example could hardly fit the interpretation of the notion of attack given in the Tallinn Manual because of lack of its destructive effects. State practice actually showed the opposite – 169 State parties[659] ratified the Anti-Personnel Landmines Convention which prohibited anti-personnel mines due to the indiscriminate effects they cause years after emplacement.[660] The emplacement of landmines on the one hand prevents the use of certain territory (or in other words – neutralizes the territory) and, on the other hand, pose threat to anyone ever accidently entering that territory. The fact that a landmine may never explode does not preclude the qualification of an act of their emplacement as an attack.

The second view, which entails even minor inconvenience to civilians in the definition of attacks (Dörmann, partly Droege) is a too-broad approach having not much to do with rules protecting civilian population and individual civilians. According to such a view, temporal loss of internet connection due to satellite signal jamming would constitute an attack even though it would not inflict injuries or deaths of civilians.

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659 See UNTS status of Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, accessed August 24, 2022, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-5&chapter=26&clang=_en.

660 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, Sept. 18, 1997, 2056 U.N.T.S. 211.

Schmitt correctly noted that inconvenience and interference with the daily lives of civilians are a frequent result of armed conflict.[661]

The Author is of the view that a universal formula able to arrange all activities into attacks and acts unregulated by targeting rules of IHL is hard to find. It should be noted that no line of IAP requires the attack to be waged by a physical appearance of the mean and have permanent physical effect of the use of that mean. Preventing civilians, even temporarily, from the use of a certain object could in certain circumstances constitute damage, invoke injuries or deaths (e.g., preventing the use of GNSS satellites would likely cause damage to civilians and/or objects) while in other cases would not (e.g., preventing the use of weather satellites is unlikely to cause such damage). Author believes that the purpose of IHL – to spare civilians and civilian objects – should remain the key consideration in any military operation whether it constitutes an attack or not. Notably, Article 48 requires Parties to the conflict distinct from civilians and make distinction between military objectives and civilian objects in all military operations, not only attacks. Therefore, parties to the conflict should first and foremost consider the effects of their activities on individual civilians or civilian population and civilian objects, but not whether their means of warfare would reach certain level of violence in a limited semi-attack activity. As it was said before, states do not consider jamming radio communications constituting attacks, but would not it be logical to treat them as such, if the sole purpose of jamming major broadcasting sources is to prevent the civilians to be informed about imminent military attack and cause more civilian injuries and deaths? The juggling with legal terms without adequate considerations of what is the primary goal that these terms help to achieve is risky and detrimental.

In case of temporal loss of a function of an object, it would be reasonable to qualify such damage as invoked by the attack if under given circumstances civilian population or individual civilians might face threat to their health or life. Inability to withdraw funds from ATMs, use bank accounts and buy foodstuffs, inability to safely land an aircraft, inability to use electricity or heating systems (especially during the cold season) are examples of threat to health or survival of civilians. Any disruption of functions of an object which plays an essential part in ensuring the health and survival of civilians should constitute an attack despite the temporariness or the method of repair to be used to restore these disrupted functions. Propaganda would not usually constitute an attack because it would not pose threat to health and survival of civilians. But it in some cases it probably would, if, for example, the message contained information constituting incitement to commit a crime.

Author suggests that the notion of attacks with all of the flowing legal requirements (including targeting rules) should be interpreted on consequence-based approach. Commanders or other targeting decision makers should not only focus on the primary consequences the attack on a target could cause, but the consequences the attack on the target could likely cause to individual civilians, civilian population or civilian objects. The discussion on loss functionality of an object or inconvenience to

661 Schmitt, "Cyber Operations and Jus in Bello: Key Issues." 95.

its users leans to an impasse of neither illegitimate nor legal targeting depending on an interpretation of the definition of attack made by a targeting decision maker. The Author believes that the legal notion of attacks should not be restrained by interpretation of legal tests, but rather by the likely consequences of the planned military activities which may cause injury or death of individual civilians, civilian population or damage to civilian objects. It is less irrelevant whether the opponent's military objective is damaged, neutralized or captured, whether it needs to be restarted, reinstalled or replaced, what is relevant the most, is the estimation of damage upon those who do not participate in hostilities which would be caused due to military activity against that specific military objective.

3.4. Which ASAT activities are subjected to targeting rules?

ASAT activities which cause physical damage are unquestionably regulated by the targeting rules, because these activities cause damage and damage connotes to the act of violence which is determinative to the legal qualification of attacks. However, the legal formula of satellite signal interference is not so straightforward. Therefore, based on current technologies and satellite-involved incidents, it should be further elaborated which ASAT activities besides those causing physical damage are regulated by IHL's targeting rules.

Mountin wrote: "if satellite signal interference is conducted in the context of IAC [international armed conflict], its use and application is subject to specific rules for IAC as set forth within the IHL normative framework. Likewise, if interference is utilized in a NIAC [non-international armed conflict], the rules applicable to NIAC would apply"[662] (parenthesis added by the Author). This thought is generally agreeable, since obligations of conduct in hostilities rise only during the armed conflict. However, what constitutes "context" of an armed conflict is debatable and such a general idea would not let one to conclude whether, for example, non-destructive activities as satellite signal interference committed in context of an armed conflict would fall under legal constraints of conduct in hostilities. The previous chapter shows how difficult it may be to determine rules of targeting in situations where the activity impose not destructive, but rather disruptive effects.

It may be said, though, that ASAT activities constituting attacks are subjected to targeting rules. It is non-negotiable that any violence causing physical destruction or damage to an object constitutes an attack under *jus in bello.* The use of a kinetic kill vehicle against a satellite would do so as well. However, the use of non-kinetic means against satellites may pose legal challenges. As it was discussed in the previous chapter, the focus should be given not to the scrabble of terms, but rather to perception of consequences the potential attack may impose. The range of circumstances in the use of different types of non-kinetic ASAT weapons may differ, as may the applicable law.

662 Sarah M Mountin, "The Legality and Implications of Intentional Interference with Commercial Communication Satellite Signals," *International Law Studies* 90, no. 101 (2014): 160.

Satellite signal jamming technologies may be used for various purposes: to distract military activities (as was the case with 2018 NATO exercise) or to distract civilian life (as was with 2010 Al-Jazeera World Cup broadcasts[663]). The jamming of World Cup broadcast would not only pose no direct health or life threats to civilians, but can hardly be perceived as part of any military operation. However, if satellite signals were jammed to disrupt military activities of the opponent, they would constitute attacks if such signal jamming could lead to damaging opponent's military objective or pose potential threat to civilians, civilian population, or civilian objects. For instance, jamming satellites of global navigation satellite systems (GNSS) could potentially pose threat to the opponent and civilians using services of this satellite network because signals of these satellites are transmitted not to a specific device but to multiple devices having GNSS receivers. Such a transmission has no identified end-user, similarly as in case of power grids (unless a power grid is connected only with infrastructure of military nature). Another example could be regional denial of GNSS services implemented against one's own satellite network. United States possess Counter Communications System Block 10.2 which is a transportable space electronic warfare system that reversibly denies the adversary certain satellite communications.[664] In other words, United States may target its own GPS satellite network to deny its services in certain territory. If such a denial system disrupted functionality of opponent's equipment, for example, mislead the smart bomb, it would constitute an attack even though the primary target is an object owned by oneself. The notion of a target should be interpreted in the whole context of military operation even though some episodes of targeting might involve destruction of objects owned by oneself. For instance, attack on a bridge belonging to one party to the conflict to disrupt logistical support of the enemy should still meet the targeting requirements – precautions should be taken and collateral damage estimated. In such an operation, not the bridge is the final target, but the opponent's maneuver capability. It should be recalled that under IAP Article 49, attacks are acts of violence against the adversary, but in the regional satellite denial event, the final target would be systems of the opponent vulnerable to the use of GPS and not one's own satellite.

Should spoofing constitute an attack is yet another question of discussion. The qualification of spoofing as an attack depends from many circumstances. The spoofing itself does not cause damage, but (usually) temporal loss or misinterpretation of satellite signal. In case that happens and the opponent faces only disturbances or inconveniences of the equipment in use, most likely such an act would not mount to an attack. However, if by spoofing the opponent would face similar consequences as United States in Iran's successful case, we might have different legal perception. As

663 Ian Black, "Al-Jazeera World Cup Broadcasts Were Jammed from Jordan," Al Jazeera, 2010, https://www.theguardian.com/media/2010/sep/29/al-jazeera-world-cup-jordan.

664 Space and Missile Systems Center Public Affairs, "Counter Communications System Block 10.2 Achieves IOC, Ready for the Warfighter," Space Force News, 2020, https://www.spaceforce.mil/News/Article/2113447/counter-communications-system-block-102-achieves-ioc-ready-for-the-warfighter/.

one of the factors determining military advantage is capture,[665] any use of means and methods causing capture of enemy's military equipment should logically constitute an attack. Even though it may seem that spoofing itself has no violent effects required for attacks, in some cases it may have. For example, spoofed coordinates of an unmanned aerial vehicle causing its crash in the inhabited area does have violent effects. On the other hand, as already discussed, the language of the definition of attacks and military objective chosen in IAP suggest that violence connotes not only to the damage in strict sense (the physical break of the target), but also neutralization and capture rendering the opponent incapable of targeted object's use. Therefore, in cases of spoofing leading to loss of control of a target, rules of targeting should be invoked.

One should also bear in mind that no matter how militarily "soft" signal jamming or spoofing may sound, the major focus when planning attacks should be given to satellite end-users and perception of events when signals are lost, spoofed, or jammed. The major satellite networks which are being constantly used by a variety of users in everyday life is GNSS. Any kinetic or non-kinetic attack on a satellite providing PNT services risks of causing unexpectable, uncalculatable, and inestimable collateral effects. A consequence-based approach would be of help in such quasi-attack or soft military power planned activity qualification.

Rendezvous or close-proximity satellite operations are also intricate to qualify. In case when the proximity operation is planned to cause physical damage to the targeted satellite, such as by collision, the use of robotic arm or elsehow, rendezvous constitutes an attack. However, it is less evident when rendezvous has no such purposes. First, we should recall that intelligence operations, similarly as psychological operations, do not constitute attacks as they have no violent effects, they are not meant to destroy, capture, or neutralize an object (at least directly). Therefore, rendezvous operations meant for spying are not attacks, they need not follow any targeting requirements. However, rendezvous operations might have other purposes than merely intelligence. For instance, a satellite might come close to another satellite for the purpose of shadowing its signals as was the case with Russian satellite in 2020 shadowing a spy satellite of the United States. The loss of the shadowed satellite signals may equally amount to the loss of control or rather temporal neutralization of that satellite. Therefore, a state shadowing another state's satellite should follow targeting rules, especially the requirement of proportionality assessment, if the shadowed satellite is also used by civilians.

It is hardly possible to examine all possible scenarios of satellite activities. It is a needless task. However, we could draw certain suggestions which would help doing so. First, the attacking party should consider whether the planned activity may be foreseen to cause negative physical effects to the targeted satellite. If so, such an activity should follow targeting rules. Secondly, the attacking party should consider whether the targeted satellite is also used by civilians. If so, it should take necessary precautions, especially estimate collateral damage before waging an attack (see "3.8.4.2. Assessment of Collateral damage"). Thirdly, a state should consider whether its planned ASAT

665 *See* "3.2.2 The subjective element of military objective."

activity is likely to neutralize a satellite or render it uncontrollable for the owner. If so, the attack should follow the targeting rules. Fourthly, an ASAT activity which may be expected to cause injuries or deaths of civilians, damage or destruction of civilian objects, should follow targeting rules irrespectively whether the attacking party qualifies it as an attack or not.

3.5. Principle of military necessity and satellite targeting

3.5.1. General remarks

IHL is the law of balance – it seeks to minimize human suffering while at the same time allows effective implementation of military operations. The maxim declaring that "the right of belligerents to adopt means of injuring the enemy is not unlimited", repeated in multiple treaties since 1899, reflects the balancing function of IHL.[666] According to the ICRC, military necessity runs counter to humanitarian exigencies and consequently the purpose of humanitarian law is to strike a balance between military necessity and humanitarian exigencies.[667] Dinstein illustrated that no limitation of the conduct of hostilities would negate the major premise that the choice of means and methods of warfare is not unlimited while if the benevolent humanitarianism were the only factor to be weighed in hostilities – "war would not be war".[668] Having in mind that humanity and military necessity are usually portrayed to sit on different plates of the balancing IHL scale, it may seem that the principle of military necessity serves as catalysator for military activities or even atrocities while humanitarian concerns prohibit such action. It would seem that principle of military necessity is straightforward. Indeed, many scholars portray military necessity as the "principle that allows belligerent parties lawfully to kill and injure persons, and to damage and destroy property"[669], as "legal justification" for illicit acts[670], "formerly unlimited potential for State action in

666 To name only a few: Convention (II) with Respect to the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 29 July 1899, art. 22; Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 18 October 1907, art. 22; 1977 IAP, art. 35(1), preamble of the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects as Amended on 21 December 2001.

667 G. I. A. D. Draper, "Military Necessity," *Military Necessity and Humanitarian Imperatives* 12, no. 2 (1973): 129–52.

668 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, 4-5.

669 Caitlyn Georgeson, "Targeting in Outer Space: An Exploration of Regime Interactions in the Final Frontier," *Journal of Air Law and Commerce* 85, no. 4 (2020), 613.

670 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 6.

warfare" and "recognition of a defence within the law"[671]. However, this is not necessarily true, especially if we looked at this principle from other angles. Some authors argue that principle of military necessity is the most central but misunderstood,[672] others indicate that it is "prone to misunderstanding, manipulation and invocation".[673] The Author argues that this principle is rather of limiting nature than the permissive and plays a very important role in preserving outer space.

3.5.2. Military necessity in *lex scripta*

In broad sense, "necessary" may be defined as something needed to be done, achieved or obtained. Accordingly, military necessity means military actions needed to be conducted. According to ICRC's dictionary on LOAC terms, military necessity, in its broad sense, means "doing what is necessary to achieve a war aims. <…> In its narrow sense, military necessity is recognized by the rules of international law and intended to be applied in the context of those rules and as derogations thereto, within the and conditions of those derogations."[674] The narrow definition, evidently elaborating the broad one, implies an important characteristic of this principle – military necessity is part of all the rules constraining warfare, not merely allowing the use of force.

According to Solis, principle of military necessity, contrary to other general principles of IHL, is not codified in major IHL treaties, that is, 1949 Geneva conventions or their 1977 Additional protocols. Although this assertion is debatable, because military necessity has clearly left marks in a few rules of the mentioned treaties (they are discussed further), however, we could generally state that military necessity is not defined in these treaties which may be the reason why there is more than one way to interpret it.

Principle of military necessity is directly reflected only in few articles of IHL treaties making *lex scripta* very limited on this matter. The examples are as follows. Article 23(g) of the 1907 Hague Convention (IV) respecting the Laws and Customs of War on Land (hereinafter – 1907 Hague IV Convention) forbids destroying or seizure of the enemy's property, unless such destruction or seizure is imperatively demanded by the necessities of war.[675] Article 33(2) of the 1949 GCI prohibits diverting the purpose of medical establishments of the armed forces, however, may be used by the commanders

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671 H. McCoubrey, "The Nature of the Modern Doctrine of Military Necessity," *Military Law and Law of War Review* 30, no. 1–4 (1991): 219.

672 Michael N. Schmitt, "Military Necessity and Humanity in International Humanitarian Law : Preserving the Delicate Balance," *Virginia Journal of International Law* 50, no. 4 (2010): 796.

673 Nobuo Hayashi, "Requirements of Military Necessity in International Humanitarian Law and International Criminal Law," *Boston University International Law Journal* 28, no. 1 (2010): 41.

674 Pietro Verri, *Dictionary of the International Law of Armed Conflict* (Geneva: International Committee of the Red Cross, 1992): 75.

675 Annex to the "Convention (IV) Respecting the Laws and Customs of War on Land and Its Annex: Regulations Concerning the Laws and Customs of War on Land", Art. 23(g).

of the forces in the field in case of urgent military necessity provided they make previous arrangements for the welfare of the wounded and sick.[676] Article 28 of the 1949 GCII stipulates that the commander into whose power sick-bays fall may apply other purposes for them in case of urgent military necessity.[677] Article 126(2) of GCIII states that visits of representatives of Protecting Powers shall not be prohibited unless for reasons of imperative military necessity and then only as an exceptional and temporary measure.[678] Article 108(2) of the GCIV allows internees to receive individual parcels and quantity of such shipments, but limits this right when military necessity so requires.[679] Article 54(5) of API states that objects indispensable for the survival of the civilian population (e.g. agricultural areas, foodstuffs, drinking water, etc.) are protected from attacks, unless they are in the national territory of the party to the conflict and it is fighting against an invasion, and it is required by imperative military necessity.[680] Article 62(1) of the same protocol provides civil defence organizations with the right to perform their civil defence tasks except in case of imperative military necessity[681] while according to the Article 67(4), the material and buildings of military units permanently assigned to civil defence organizations which exclusively perform civil defence tasks may not be diverted from their civil defence purpose, except in case of imperative military necessity.[682] Article 71(3) of API stipulates that activities of relief personnel may be limited only temporary and only in case of imperative military necessity.[683] Interestingly, IIAP reflects some of the afore mentioned examples (e.g. right of internees to receive shipments), however, the term "necessary" is used instead of "militarily necessary" or "military necessity".[684] It shall be noted that neither of the above mentioned rules, nor, in fact, any other rules of international law, disclose what stands for "necessities of war" or "military necessity". The text of 1907 Hague IV Convention Article 23(g) is repeated in few parts of the Rome Statute of the International Criminal Court, where the definition of military necessity is also lacking, even though the breach of it constitutes a war crime.[685] The lack of *lex scripta* definition of military necessity is probably one of the reasons why interpretation of this principle had many shifts from one time or another. The ways publicists have interpreted military necessity are presented in subsequent subchapter.

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676 1949 GC I, art. 33(2).

677 1949 GC II, art. 28.

678 1949 GC III, art. 126(2).

679 1949 GCIV, art. 108(2).

680 1977 IAP, art. 54(5).

681 1977 IAP, art. 62(1).

682 1977 IAP, art. 67(4).

683 1977 IAP, art. 71(3).

684 See 1977 II AP, arts.: 5(2)(b); 5(4); 6(2)(a).

685 Rome Statute of the International Criminal Court, Jul. 1, 2002, 2187 U.N.T.S. 3 (hereinafter – Rome Statute), arts. 8[2] 2(a)(iv); 2(b)(xiii); 2(e)(xii).

Even prior to describing ways to interpret military necessity and despite the lack of definition of military necessity in the *lex scripta*, certain conclusion may be drawn from the above-mentioned rules. All sources where military necessity is inscribed show that military necessity may be interpreted as a normative exception to the conduct which otherwise is prohibitive. This is because some rules have absolute prohibition (such as attacking civilians) and other – conditional prohibition (such as attacking objects indispensable for the survival of the civilian population if it is militarily necessary). All of the mentioned rules have an aim to make an exception to the required conduct. In other words, military necessity allows derogation from otherwise prohibited acts if such derogation is militarily necessary and such necessity is explicitly defined in the rule. On the other hand, if we took this, say, positivist approach, military necessity would be a very limited and narrow principle having only few occasions (which have been quoted above) of practical implementation. To better understand whether military necessity serves only as an exception to limited number of rules, or has more implications, state practice, jurisprudence of international courts and views of publicists are presented further.

3.5.3. Interpretation of military necessity

Historically, principle of military necessity had been interpreted in different ways. Military necessity played an important role in the medieval just-war doctrine. This doctrine promulgated the right of the just side of war to use whatever degree of force that was strictly necessary in the particular circumstances of the case to bring about victory. Beyond that – all other use of force was unlawful.[686] According to just-war doctrine, damage or injuries to innocent persons are justified if the use of force weakened the enemy's resources.[687] On the other hand, just-war doctrine emphasized the importance of legitimate *justa causa,* which in itself prohibited any wanton acts which have no military, but merely satisfactory goal.[688] In the modern world, there have been attempts to conceptualize military necessity as an excuse to commit illegitimate acts of war (the Author will further use the term "military necessity excuse" to emphasize the wrongful understanding that any acts of war are permitted if they are militarily necessary). The concept of military necessity excuse dates very far back in the history of warfare, in those times when warfare was not even regulated by the scripted laws of war. It had been said that necessities in war overrule usages of warfare.[689] Within the birth of modern rules of war (throughout the XIX and XX centuries) some Authors maintained that military necessity excuse is applicable only in extreme cases – when

686 Stephen C. Neff, *War and the Law of Nations: A General History* (Cambridge: Cambridge University Press, 2005), 64.

687 Stephen C. Neff, *War and the Law of Nations: A General History.*

688 Stephen C. Neff, *War and the Law of Nations: A General History.*

689 Lassa Oppenheim, *International Lw. A Treatise. Vol II.*, 2nd ed. (London: Longmans, Green and Co., 1912), 84.

violation of the laws of war alone offers either a means of escape from extreme danger or the realisation of the purpose of war – overpowering of the opponent.[690] This view is illustrated by the German maxim stating *Kriegsraeson geht vor Kriegsmanier* (necessity in war overrules the manner of warfare). Nowadays it is universally agreed that this *Kriegsraeson* maxim is outdated and incompatible with the operation of IHL in the modern world.[691] Probably the last defence for the military necessity excuse was introduced in the aftermath of Second World War during the trial of German officers in *Hostage Case* in Nuremberg. German defence argued that it was up to German commanders to decide what is militarily necessary.[692] Defendants used military necessity as justification for the killing of innocent members of the population and the destruction of villages and towns in the occupied territory.[693] The Court found that military necessity "permits a belligerent, subject to the laws of war, to apply any amount and kind of force to compel the complete submission of the enemy with the least possible expenditure of time, life, and money. In general, it sanctions measures by an occupant necessary to protect the safety of his forces and to facilitate the success of his operations. It permits the destruction of life of armed enemies and other persons whose destruction is incidentally unavoidable by the armed conflicts of the war; it allows the capturing of armed enemies and others of peculiar danger, but it does not permit the killing of innocent inhabitants for purposes of revenge or the satisfaction of a lust to kill. The destruction of property to be lawful must be imperatively demanded by the necessities of war. Destruction as an end in itself is a violation of international law. There must be some reasonable connection between the destruction of property and the overcoming of the enemy forces. It is lawful to destroy railways, lines of communication, or any other property that might be utilized by the enemy. Private homes and churches even may be destroyed if necessary for military operations. It does not admit the wanton devastation of a district or the wilful infliction of suffering upon its inhabitants for the sake of suffering alone. <…> Military necessity or expediency do not justify a violation of positive rules. International law is prohibitive law."[694] In general, the Court explained that under certain circumstances damage to civilians and civilian objects is permissible, but under no circumstances it is permissible merely for the purposes of suffering or damage alone.

Another interpretation of military necessity, similarly as in the case with *Kriegsraeson*, justifies departure of international obligations when it is militarily necessary,

690 Lassa Oppenheim, *International Lw. A Treatise.*

691 Michael N. Schmitt, "Military Necessity and Humanity in International Humanitarian Law : Preserving the Delicate Balance," *Virginia Journal of International Law* 50, no. 4 (2010): 798.

692 Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, U.S. v. Wilhelm List et al. (the Hostage trial), 1255.

693 Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, U.S. v. Wilhelm List et al., 1253.

694 Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, U.S. v. Wilhelm List et al. 1253; 1255.

however, such a departure would be valid only for self-preservation motives (the Author will further name this interpretation as "breach-permissive for self-preservation"). For instance, according to Stone, military necessity does entitle a state at war to depart from its duties under international law on account of self-preservation.[695] In context of the breach-permissive for self-preservation interpretation, Hayashi analyses the controversial ICJ Nuclear Weapons Opinion where the Court indicated that "the principles and rules of law applicable in armed conflict – at the heart of which is the overriding consideration of humanity – make the conduct of armed hostilities subject to a number of strict requirements. Thus, methods and means of warfare, which would preclude any distinction between civilian and military targets, or which would result in unnecessary suffering to combatants, are prohibited."[696] ICJ admitted that these restrictions seem "scarcely reconcilable" in the event of the use of nuclear weapons,[697] however, would not necessarily invoke a breach of the principles of the law of armed conflict in any circumstances.[698] ICJ unanimously concluded that a "threat or use of nuclear weapons should also be compatible with the requirements of the international law applicable in armed conflict, particularly those of the principles and rules of international humanitarian law, as well as with specific obligations under treaties and other undertakings which expressly deal with nuclear weapons".[699] The court even admitted that generally, the threat or the use of nuclear weapons would be contrary to the rules of international law applicable in armed conflict, in particular the principles and rules of humanitarian law, however, in an even seven-to-seven voting with the president's casting vote in favour of the opinion, probably the most controversial to date statement of ICJ has been made: "in view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake."[700] Two important characteristics of this decision need to be stressed: firstly, ICJ admitted that the use of nuclear weapons would breach general principles of IHL; secondly, ICJ could not conclude the legality of the use of nuclear weapons only in context of *jus ad bellum*. Importantly, ICJ has never described or concluded that military necessity in context of *jus in bello* is breach-permissive. It may be said that ICJ did not add up to interpreting military necessity as breach-permissive under *jus in bello,* such an interpretation in Author's opinion has no justification in international law. Actually, first nationally codified rules of military conduct (discussed further) proposed an opposite to what later had become *Kriegsraeson* or, presumably, breach-permissive for self-preservation.

695 Quoted in Hayashi, "Requirements of Military Necessity in International Humanitarian Law and International Criminal Law", 52-53.

696 ICJ Nuclear Weapons Opinion, para. 95.

697 ICJ Nuclear Weapons Opinion.

698 ICJ Nuclear Weapons Opinion, para. 96.

699 ICJ Nuclear Weapons Opinion, para. 105.

700 ICJ Nuclear Weapons Opinion.

The earliest official national codification of the law of war, called Instructions for the Government of Armes of the United States in the Field, also known as the Lieber Code, was drafted by United States President Lincoln's adviser Francis Lieber. The Lieber Code introduced the concept of military necessity as a tool to limit violence and such novelty has been said to have the "greatest theoretical contribution to the modern law of war".[701] Lieber Code described military necessity as follows: "[m]ilitary necessity, as understood by modern civilized nations, consists in the necessity of those measures which are indispensable for securing the ends of the war, and which are lawful according to the modern law and usages of war."[702] Lieber Code further emphasized that military necessity admits collateral, incidental and unavoidable destruction of armed' enemies and other persons, property, channels of traffic, travel, or communication, however, military necessity does not admit of cruelty – the infliction of suffering for the sake of suffering or for revenge and, in general, it does not include any act of hostility which makes the return to peace unnecessarily difficult.[703] Lieber Code identified two essential criteria for military necessity: first, application of measures which are indispensable to secure the end of war and, second, these measures must be lawful. As seen, Lieber Code did not portray the principle of military necessity as justification for military misconduct but rather as a limitation of military conduct. As seen in further subchapter, the impact of Lieber Code to shaping understanding of military necessity in subsequent IHL documents is evident.

IHL, as a branch of international law, is mostly prohibitive in nature. This is because IHL may only be disregarded in the light of military necessity when expressly permitted by the particular rule itself.[704] The mere plea of military necessity is not sufficient to evade compliance with IHL, otherwise, the entire body of IHL would be a mere "code of military convenience".[705] As already indicated, the *lex scripta* of IHL evidently suggests the fact that belligerent activities may not be justified by military necessity, unless it is explicitly stated so. Hence, from a positivist perspective, military necessity may be interpreted as normative exception to the conduct which otherwise is prohibitive or, in other words, military necessity allows attacks on objects only if it is unambiguously permitted so.

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701 Burrus M. Carnahan, "Lincoln, Lieber and the Laws of War: The Origins and Limits of the Principle of Military Necessity," *The American Journal of International Law* 92, no. 2 (1998): 213–31.

702 Francis Lieber, "Instructions for the Government of Armies of the United States in the Field" (1863). art. 14.

703 Francis Lieber, "Instructions for the Government of Armies of the United States in the Field", arts. 15-16.

704 Leslie C. Green, *The Contemporary Law of Armed Conflict*, 2nd Ed. (Manchester: Manchester University Press, 2000), 122.

705 Leslie C. Green, *The Contemporary Law of Armed Conflict*, 123.

3.5.4. Military necessity in national military manuals

State practice indicates that military necessity is usually perceived as a limiting principle requiring control of the use of force. United States FM6-27 Commander's Handbook on the Law of Land Warfare (hereinafter – FM6-27 Manual) indicates that military necessity justifies the use of all measures required to defeat the enemy as quickly and efficiently as possible that are not prohibited by the law of armed conflict.[706] Similarly, United States Commander's Handbook on the Law of Naval Operations indicates that "military necessity recognizes that force resulting in death and destruction will have to be applied to achieve military objectives, but its goal is to limit suffering and destruction to that which is necessary to achieve a valid military objective. Thus it prohibits the use of any kind or degree of force not required for the partial or complete submission of the enemy with a minimum expenditure of time, life, and physical resources. <…> [P]rinciple of military necessity does not authorize acts that are otherwise prohibited by the law of armed conflict and that military necessity is not a criminal defense for acts expressly prohibited by the law of armed conflict."[707] According to the Danish LOAC Manual, military necessity requires that the use of force be lawful, controlled, and necessary. The requirement of lawfulness assumes that the use of means and methods of warfare does not violate the rules of IHL. The use of force must be controlled to ensure that it is linked to the achievement of the strategic military objective. Accordingly, any use of force that is not for the purpose of achieving the complete or partial surrender of the adversary is unlawful. Necessary implies for complete or partial surrender of the enemy which means that in some cases the complete surrender of the adversary's armed forces may be not necessary in all circumstances. Sometimes it may be necessary only to drive the opponent's armed forces away from certain territory to achieve a military goal rather than to destroy or force to complete surrender.[708] According to Canadian LOAC manual, the "concept of military necessity justifies the application of force not forbidden by International Law, to the extent necessary, to bring about the complete submission of the enemy at the earliest possible moment with the least possible expenditure of personnel and resources."[709] The concept of military necessity presupposes that a) the force used can be and is being controlled; b) that the use of force is necessary to achieve the submission of the enemy; and c) the amount of force used is limited to what is needed to achieve prompt submission.[710]

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706 Department of the Army and United States Marine Corps, "The Commander's Handbook on the Law of Land Warfare," Pub. L. No. FM 6-27 MCTP 11-10C (2019), 1-6.

707 US Department of Navy, "The Commander's Handbook on the Law of Naval Operations," Pub. L. No. NWP 1-14M/MCWP 5-12.1/COMDTPUB P5800.7A, US Department of the Navy (2007), 5-2–5-3.

708 An example of Falkland War is given. Danish Ministry of Defence and Defence Command Denmark, "Military Manual on International Law Relevant to Danish Armed Forces in International Operations" (2016), 67, https://usnwc.libguides.com/ld.php?content_id=59166472.

709 Canadian National Defence, "Law of Armed Conflict at the Operational and Tactical Levels," Pub. L. No. B-GJ-005-104/FP-021 (2011), GL-12, https://usnwc.libguides.com/ld.php?content_id=2998098.

710 Canadian National Defence, "Law of Armed Conflict at the Operational and Tactical Levels," 2-1.

German LOAC manual indicates that according to the principle of military necessity, all military measures in armed conflict which are required for the successful execution of military operations in order to engage an enemy, provided that these measures are not forbidden by LOAC.[711] The United Kingdom Joint Service Manual of the Law of Armed Conflict (hereinafter – UK LOAC Manual) stipulates that military necessity "permits a state engaged in an armed conflict to use only that degree and kind of force, not otherwise prohibited by the law of armed conflict, that is required in order to achieve the legitimate purpose of the conflict, namely the complete or partial submission of the enemy at the earliest possible moment with the minimum expenditure of life and resources."[712] UK LOAC Manual provides four basic elements that the discussed principle has: a) the force used can be and is being controlled; b) since military necessity permits the use of force only if it is not otherwise prohibited by the law of armed conflict, necessity cannot excuse a departure from that law; c) the use of force in ways which are not otherwise prohibited is legitimate if it is necessary to achieve, as quickly as possible, the complete or partial submission of the enemy; d) conversely, the use of force which is not necessary is unlawful, since it involves wanton killing or destruction. NATO Glossary of Terms and Definitions defines military necessity as the "principle whereby a belligerent has the right to apply any measures which are required to bring about the successful conclusion of a military operation and which are not forbidden by the laws of war."[713]

None of quoted national state military manuals stipulate that military necessity allows any unlimited force. In all of the quoted cases, military necessity is conditioned primarily by legitimacy of means, by the control of these means and only secondly by considerations of the amount of these means. Consequently, at least two essential elements constituting military necessity may be drawn from sources indicating *opinio juris* of states: firstly, the use of force must be controlled; secondly, the use of force should not only be legitimate, but also necessary to achieve military goals with least expenditure of resources.

3.5.5. Military necessity according to publicists

Attempts to crystalize military necessity have been made by multiple academics, many of whom made very similar statements.

In search of the definition of military necessity, McCoubrey describes two radically different views on this notion, namely, by Schwarzenberer and Pictet.[714] While

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711 German Federal Ministry of Defence, "Law of Armed Conflict Manual," Pub. L. No. (ZDv) 15/2 (2013), 25, https://usnwc.libguides.com/ld.php?content_id=5616055.

712 Ministry of Defence, "JSP 383: The Joint Service Manual of the Law of Armed Conflict," Pub. L. No. JSP 38, Joint Service Publication 383 1 (2004), 23, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/27874/JSP3832004Edition.pdf.

713 NATO, "NATO Glossary of Terms and Definitions" (2013), 2-M-6, https://www.jcs.mil/Portals/36/Documents/Doctrine/Other_Pubs/aap6.pdf.

714 McCoubrey, "The Nature of the Modern Doctrine of Military Necessity.", 219-222.

Schwarzenberger views military necessity as an extra-legal dimension of action, limited only in so far as rules specifically describe so, Pictet is of the view that military necessity is applicable only in so far as it is impossible to comply with legal norms. In other words, according Scwarzenberer, every military action is militarily necessary, unless the law specially prohibits such action while according to Pictet, no military action is militarily necessary unless otherwise it is impossible to obey the rules. McCoubrey offers a middle-like path between Scwarzenberer's and Pictet's views invoking practicality into the definition. She states that military necessity is an "immediate and overwhelming circumstance in military action, which renders strict compliance, upon rational analysis, impractical rather than <<impossible>>".[715] She defines military necessity as "a doctrine within the laws of armed conflict which recognises the potential impracticality of full compliance with legal norms in certain circumstances, and, accordingly, may mitigate or expunge culpability for *prima facie* unlawful action in appropriate case in armed conflict. <…> The effect of the doctrine is limited to particular events and circumstances and does not have a general suspensory effect upon the laws of armed conflict".[716] Despite the deep analysis McCoubrey provided on principle of military necessity, it is questionable whether military necessity in any legally undefined cases could ever mitigate or deprive one from responsibility, especially bearing in mind that state practice (all of the afore mentioned military manuals) specifically indicates that military necessity may not justify departure from the law of armed conflict.

According to Schmitt, "military necessity prohibits destructive or harmful acts that are unnecessary to secure a military advantage."[717] He recalls the paradigm of international law that what is not forbidden is permitted and, in this context, makes a lively statement: "[m]ilitary necessity operates within this paradigm to prohibit acts that are not militarily necessary; it is a principle of limitation, not authorization. In its legal sense, military necessity justifies nothing."[718] Schmitt admitted to have changed his view in one of his subsequent works: "[w]hen crafting IHL, states therefore insist that legal norms not unduly restrict their freedom of action on the battlefield, such that national interests might be affected. The principle of military necessity constitutes the IHL mechanism for safeguarding this purpose. It is not, as sometimes asserted, a limitation on military operations. Instead, the principle recognizes the appropriateness of considering military factors in setting the rules of warfare."[719] Schmitt views military necessity as a tool to facilitate states achieving their military interests while at the same

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715 McCoubrey., 237.

716 McCoubrey., 240.

717 Michael N. Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict," *Essays on Law and War at the Fault Lines*, no. 1983 (2011): 52.

718 Michael N. Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict," 55.

719 Schmitt, "Military Necessity and Humanity in International Humanitarian Law : Preserving the Delicate Balance." 799.

time considering the well-being of their citizenry. He states that "[m]ilitary necessity and humanity exist in fragile equipoise in international humanitarian law. On the one hand, war cannot be conducted without restriction, for states are responsible for the well-being of their populations (including combatants) and must therefore agree with potential enemies on limitations that safeguard their interests. <…> Yet, if humanitarianism reigned supreme, war would not exist. Since the tragic reality is that war does, states must be reasonably free to conduct their military operations effectively."[720] Schmitt also reflected on how military necessity interacts with other cardinal principles of IHL. He emphasized that military necessity has a restrictive weight on other targeting principles.[721] According to him, IHL allows to use such methods and means which cause necessary suffering, or as he notes, "militarily necessary suffering".[722] Military necessity restricts principle of distinction in the way that Article 52(2) of the IAP prohibits attacks on objects which are not military objectives, however, the same paragraph underlines conditions under which a non-military objective can shift its legal status to the military objective and be targeted.

Bourbonniere defines military necessity as "the obligation for a belligerent to specify the imperative military advantage intended to be gained by an attack. <…> [T]he principle cannot be used to justify violations of the law itself <…> military necessity applies to operations, which are not specifically prohibited by LOAC and which are required for the success of the mission."[723] Hayashi emphasizes that there are many possible ways to examine military necessity, such as in context of material reality, norm-creation and positive law. This notion travels from the mind of an encircled field commander to that of a delegate at diplomatic conference. However, within the context of positive law, military necessity has no function but as exceptional clauses to principal rules of international humanitarian law where the latter rules envisage them expressly and in advance.[724]

Dinstein interprets military necessity as either a part of IHL's "checks-and-balances system" which allows taking the requisite measures to defeat the enemy, or as legal justification for breaches where such a justification is based on the build-in exception applicable in case of military necessity. He wrote that the law of armed conflict "cannot be oblivious to the exigencies of war and to the military necessity impelling each Belligerent Party to take the requisite measures to defeat the enemy."[725] However, he added that "the objective need to win the war is not to be confounded with the

720 Schmitt.. 837.

721 See Schmitt, "Military Necessity and Humanity in International Humanitarian Law : Preserving the Delicate Balance." 799.

722 Schmitt.

723 Michel Bourbonniere, "Law of Armed Conflict (LOAC) and the Neutralisation of Satellites or Ius in Bello Satellitis," *Journal of Conflict and Security Law* 9, no. 1 (2004): 47.

724 Hayashi, "Requirements of Military Necessity in International Humanitarian Law and International Criminal Law." 139.

725 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict,* 4.

subjective whim or caprice of an individual soldier".[726] According to Dinstein, "[o]nce LOIAC [law of international armed conflict] bans a particular conduct without hedging the prohibition with limitative words concerning military necessity, the norm has to be obeyed in its unadulterated form. The presupposition must be that the framers of the norm have already weighed the demands of military necessity and (for humanitarian concerns) have rejected them as a valid exception. In such circumstances, it is impossible to rely on military necessity as a justification for deviating from the norm. Otherwise, the whole yarn of LOIAC would unravel" (parenthesis added by the Author).[727]

Forrest describes military necessity as "a limitation to unbridled barbarity"[728] which determines the legitimacy of the armed attack.[729]

Vincze sees this principle as fostering the gain of military advantage while also manifesting the humanitarian requirements of law.[730] According to her, military necessity "is the concept of legally using only that kind and degree of force that is required to overpower the enemy. At the heart of the concept lies the criterion that no defence shall be provided in the event of unlawful actions; on the contrary: a balanced principle of military necessity fosters gaining military advantage while also manifesting the humanitarian requirements of law."[731] The concept of military necessity, according to Vincze, supports the defeat of the adversary's military forces but it does not necessitate full obliteration. The conduct of hostilities should meet the legality criteria at all times and it can be regarded as legal only to the extent that military necessity justifies it.[732]

Luban argues that there are two cultures of lawyers, namely, military lawyers and humanitarian lawyers who perceive military necessity differently creating two visions of the law of armed conflict. Military lawyers, he notes, assume that the purpose of laws of war is to give a full sway to military necessity and protect civilians only against military excess, while humanitarian lawyers tend to perceive these laws as protecting civilians even at cost to military effectiveness.[733] Luban states that "the laws of war have passed from exclusive ownership by warriors to joint ownership by the civilians whose

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726 C. Green Leslie, *The Contemporary Law of Armed Conflict*, Second (Manchester: Manchester University Press, 2000), 122.

727 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 4-7.

728 Craig J. S. Forrest, "The Doctrine of Military Necessity and the Protection of Cultural Property during Armed Conflicts," *California Western International Law Journal* 37, no. 3 (2007): 181.

729 Craig J. S. Forrest, "The Doctrine of Military Necessity and the Protection of Cultural Property during Armed Conflicts," 182.

730 Viola Vincze, "Taming the Untameable: The Role of Military Necessity in Constraining Violence," *Elte Law Journal* 2016, no. April (2016): 96.

731 Vincze.

732 Vincze, 97.

733 David Luban, "Military Necessity and the Cultures of Military Law," *LeidenJournal OfInternational Law* 26, no. 2 (2013): 323.

fate they determine. <…> [M]ilitary necessity itself requires taking civilian interests into account."[734]

Downey proposed a definition of military necessity: "[m]ilitary necessity is an urgent need, admitting of no delay, for the taking by a commander of measures, which are indispensable for forcing as quickly as possible the complete surrender of the enemy by means of regulated violence, and which are not forbidden by the laws and customs of war."[735]

The dominating view among publicists is that military necessity implies legitimate use of force. This principle is both, permissive and prohibitive in nature. It is permissive in the way that military necessity allows the use of force needed to achieve military goals. It is prohibitive because the allowed use of force needs to be legitimate.

3.5.6. Military necessity in jurisprudence of ICTY

Among international military tribunals, ICTY has been the most influential of the tribunals in interpreting and applying IHL.[736] Although not at length, but in few instances, ICTY has discussed and set certain standards on principle of military necessity.

In *Blaškić* case, the ICTY Trial Chamber stated that targeting civilians and civilian property is an offence when not justified by military necessity.[737] Similarly, in *Kordić and Čerkez* case, the Trial Chamber stated the "prohibited attacks are those launched deliberately against civilians or civilian objects in the course of an armed conflict and are not justified by military necessity."[738] The statement that civilians and civilian objects may not be attacked directly *and* if only such an attack is not justified by military necessity was criticized in subsequent cases and eventually was reversed.

In *Galić* case, ICTY took another path concerning military necessity and unambiguously stated: The Trial Chamber does not however subscribe to the view that the prohibited conduct set out in the first part of Article 51(2) of Additional Protocol I (prohibition to attack civilian population as such) is adequately described as "targeting civilians when not justified by military necessity". This provision states in clear language that civilians and the civilian population as such should not be the object of attack. It does not mention any exceptions. In particular, it does not contemplate derogating from this rule by invoking military necessity"[739] (parenthesis added, footnotes omitted by the Author). In Strugar case, ICTY Trial Chamber also opposed the *Blaškić*

734 David Luban, "Military Necessity and the Cultures of Military Law", 339.

735 William Gerald Downey Jr., "Law of War and Military Necessity," *American Journal of International Law* 47, no. 2 (1953): 254.

736 Schmitt, "Military Necessity and Humanity in International Humanitarian Law : Preserving the Delicate Balance." 817.

737 Judgement, *Blaskić,* (IT-95-14-T), Trial Chamber, 3 March 2000, para. 180.

738 Judgement, *Kordić and Čerkez,* (IT-95-14/2-T), Trial Chamber, 26 February 2001, para. 328.

739 Judgement, *Galić,* (IT-98-29-T), Trial Chamber, 5 December 2001, para. 44.

Trial Chamber statement: "there is an absolute prohibition on the targeting of civilians and civilian objects in customary international law" and established that there was no military necessity to attack the Old Town of Dubrovnik.[740] The *Blaškić* Trial Chamber decision was rejected in the Appeal Chamber's judgement where the Court stated: "there is an absolute prohibition on the targeting of civilians in customary international law."[741] The shift of legal conclusions in the mentioned ICTY cases indicates how difficult this principle is and how important it is to properly apply principle of military necessity and choose suitable words, otherwise, the standard of protection of civilians and civilian objects from direct attacks may shift from absolute, to conditional justifying those which are militarily necessary.

ICTY in *Strugar* case made a reference to the definition of military objective and indicated that an attack on non-military objective is not justified by military necessity, because it does not offer a definite military advantage.[742] Here, we may stress that the ICTY linked two separate but interconnected concepts of military necessity and military objective, the former limiting the method of warfare, the latter limiting the object of warfare. The interplay of these two concepts may be seen through property damage cases. As already mentioned, extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly is a grave breach of Geneva conventions constituting a war crime.[743]

In previously mentioned *Blaškić* case, the ICTY Trial Chamber held that the absence of military objectives in Ahmici, Stari Vitez and other villages did not justify military attacks there.[744] In other words, where an offensive is launched on a locality without military justification, military necessity is inadmissible in respect of property destruction that occurs during the course of an offensive.[745] According to Hayashi, property destruction is militarily necessary only if it is required for the attainment of a military purpose and otherwise in conformity of IHL.[746] Military necessity justifies the property's destruction, whereas the property's status as a military objective justifies attacks being directed against it.[747] In other words, military necessity and military objective are distinct but interactive notions, because military necessity, as mentioned, does allow in limited cases destroying (attacking) objects and definition of military objective defines the target which may be destroyed.

In combination of both notions and bearing in mind their different purpose, it is

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740 Judgement, *Strugar,* (IT-01-42-T), Trial Chamber, 31 January 2005, para. 280.

741 Judgement, *Blaskić,* (IT-95-14-A), Appeals Chamber, 29 July 2004, para. 109.

742 Judgement, *Blaskić,* (IT-95-14-A), Appeals Chamber, para. 295.

743 GC IV, art. 147.

744 Judgement, *Blaskić,* (IT-95-14-T), Trial Chamber, 3 March 2000, para. 410.

745 See Hayashi, "Requirements of Military Necessity in International Humanitarian Law and International Criminal Law." 110.

746 Ibid. 112.

747 Ibid. 113.

clear that only property constituting military objective may be destroyed and only if that destruction is militarily necessary. Taking into account the second element of the definition of military objective – a definite military advantage gained after the attack – we could even state that even though an object offers a definite military advantage it does not necessarily mean that it is targetable, because it might be so that military necessity may be lacking. The jurisprudence of ICTY shows that military necessity does not allow in any way breaches of IHL or, in other words, this principle is not permissive in nature. Even though at some point targeting civilians or civilian objects might be militarily necessary, such an attack could not be justified by military necessity because such targeting itself is illegal. Therefore, military necessity stands as an additional condition for attack legitimacy – an attack may not be legitimate if it is not militarily necessary, even when a target is military objective.

3.5.7. Applying military necessity to satellite targeting

Military necessity once was a tool to legitimize otherwise illegitimate acts. It served as an excuse to commit war crimes, as a defence notion in courts and as a catalysator of the unlimited use of force. Nowadays, military necessity is understood as a limiting principle which allows using only necessary, controllable and legitimate force to achieve victory. Usually, military necessity is perceived as a sustainable tool of military conduct requiring the military goal to be achieved with least expenditure of time, life and physical resources. Put it other way, military necessity requires precision and attention in planning military attacks and opting the best military means to have least negative effects. If we add a positivist approach, military necessity serves not only as a requirement to surgically conduct attacks but also use force against targets when the law explicitly allows so doing.

That being said, we may contemplate how military necessity affects satellite targeting. First and foremost, military necessity allows targeting satellites which constitute military objectives. However, targeting satellites, even those which constitute military objectives, is not unlimited.

Certain military and civilian habits are served by multiple satellites orbiting the Earth. GNSS satellite networks constantly send data to receivers on Earth, however, only few receivers and only for a limited time actually use data sent from specific satellites. It may be the case that intelligence data provided a specific time of an attack where it would be possible to calculate which satellites would actually serve the smart missile or any other device using GNSS singles. In this way, military necessity would require targeting not the whole GNSS network but only a specific satellite (or satellites) to ensure accuracy of a device and success of the attack.

The least expenditure of time, lives and recourses requires estimation of alternative military means. In some cases, down-link or up-link signal loss prevention may be achieved using less destructive and probably less expensive means than sending a missile to outer space, for example jamming satellite signals or destroying ground stations. In context of conventional Russian-Ukrainian war started at 2022, one could

even imagine how many missiles would it take for Russia to destroy GPS network, communication and intelligence satellites, as well as Starlink to achieve military goals to disturb mobility of troops, communication networks, intelligence data and internet over Ukraine. The use of a signal jamming devices instead of explosive ones seems to be in line with military necessity.

Lastly, as was already said, not all military satellites are military objectives because the destruction of some of them in particular circumstances may lack definite military advantage. Military necessity similarly requires taking only necessary means to achieve military goals. Targeting satellites without precise knowledge of their military potential and actual military use would contradict principle of military necessity as there might be no evident necessity to do so.

Satellite targeting is not specifically regulated by IHL, most of the rules having a military necessity exception are irrelevant and, therefore, positivist approach for the time being is left out of this topic. Since military necessity requires taking only legitimate measures, this principle constantly interacts with other principles defining what are those legal measures. They are discussed further.

3.6. Unnecessary suffering

The principle prohibiting unnecessary suffering, synonymously called principle of humanity, or by a French term *maux superflus,* is directly linked with the principle of military necessity and is a counterbalance to the latter. Boothby noted that this principle "remains a fundamental cornerstone of the law of weaponry."[748] This principle forbids the infliction suffering, injury, or destruction not actually necessary for the accomplishment of legitimate military purposes.[749] Principle of humanity primarily concerns the protection of individuals, because suffering may be inflicted only against living organisms. However, it does not mean that in context of satellite attacks this principle is entirely irrelevant, because as it is shown further, the application of this principle does not depend on the chosen target, but rather on consequences of the attack.

Principle of humanity was first codified in the 1868 St. Petersburg Declaration which prohibited the use of projectiles weighting less than 400 grammes which "uselessly aggravate the sufferings of disabled men" and is being "contrary to the laws of humanity".[750] In the modern law spectrum, this rule is established in Article 35(2) of IAP's as one of the basic IHL rules, which states "[i]t is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering." Authors of Bothe's IAP Commentary emphasized that prohibition of unnecessary suffering is "valid only for weapons designed exclusively

748 Boothby, *The Law of Targeting*. 259.

749 Boothby. 59-60.

750 1868 St. Petersburg Declaration.

for antipersonnel purposes."[751] Weapons are developed to be used to fulfil a variety of military requirements other than merely disabling enemy combatants, for example, to destruct military material, restrict military movement, weakening war making resources, etc. Therefore, according to authors of Bothe's IAP Commentary, an artillery projectile or missile designed to destroy field fortification or heavy material may be expected to cause injuries to personnel in the vicinity of the target which would be more severe than necessary to render these combatants *hors de combat,* but no authority has questioned the lawfulness of such projectiles despite the gravity of their incidental effect on personnel.[752]

Even though only living organisms face suffering and principle of humanity in most part has individual scope of applicability, it should also be stressed that Article 35(2) does not indicate in any way that the cause of unnecessary suffering is prohibited only in terms of direct attacks on individuals (both, combatants, and civilians). What does this rule limit, is the means and the way they are used. The use of certain excessive means on an object may cause collateral damage to individuals which may amount to unnecessary suffering. Therefore, the planning of an attack on an object such as a satellite does not preclude considerations of humanity and it is not entirely correct to operate on principle of humanity merely in context direct attacks on individuals. More to add, orbital weapons may as well be used to target objects on Earth (such as an undeveloped space-based kinetic weapon "Rods from God"[753]) and directly cause unnecessary suffering. On the other hand, legal considerations on the use of such weapons, strictly speaking, would not reflect the object of this thesis as the focus is given to satellite targeting rather than the Earth (except for satellite systems, such as ground stations).

The principle of unnecessary suffering forbids the use of weapons that increase suffering without really increasing military advantage.[754] In moral terms, any weapon causes suffering and any suffering may be treated as unnecessary, however, from legal point of view, unnecessary means only such suffering as exceeds the otherwise normally achievable military advantage. ICJ in Nuclear Weapons Opinion described unnecessary suffering as a useless aggravating of suffering where the harm is greater than that unavoidable to achieve legitimate military objectives.[755] Judge Higgins in the dissenting opinion in ICJ Nuclear Weapons Opinion stated that in interpreting the notion

751 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 226.

752 Bothe, Partsch, and Solf. 226.

753 See Blake Stilwell, "The US Air Force's 'rods from god' could hit with the force of a nuclear weapon — with no fallout", Business Insider, accessed July 28, 2019, https://www.businessinsider.com/air-force-rods-from-god-kinetic-weapon-hit-with-nuclear-weapon-force-2017-9.

754 Burrus M. Carnahan, "Unnecessary Suffering, the Red Cross and Tactical Laser Weapons," *Loyola of Los Angeles International and Comparative Law Journal* 18, no. 4 (1996): 705–32. 713.

755 International Court of Justice, LEGALITY OF THE THREAT OR USE OF NUCLEAR WEAPONS ADVISORY OPINION OF 8 JULY 1996. 257.

of unnecessary suffering the balancing concept of humanitarian and military aspects should be taken into account. He noted that the "principle does not stipulate that a legitimate target is not to be attacked if it would cause great suffering." The principle of military necessity is a protection for the benefit of military personnel.[756] The balancing between suffering and military effectiveness is difficult in practice because neither side of the equation is easy to quantify.[757] According to Dinstein, a weapon is proscribed only if it causes injury or suffering that can be avoided, given the military constraints of the situation.[758] Dinstein summarised opinions of Greenwood and authors of Bothe's IAP Commentary and proposed a double test helping with qualification of unnecessary suffering: "(a) is there an alternative weapon available in the military menu, causing less injury or suffering?; and, <…> (b) are the effects produced by the alternative weapon sufficiently effective in neutralizing enemy personnel?"[759] The test evidently suggests evaluating both sides of the equation: first, the humanitarian, begging for less damage and, second, the military begging for utility and military result.

Despite the fact that determination of unnecessary suffering is rather subjective, in an attempt to objectivise qualification of weapons causing unnecessary suffering, around 50 delegations which included lawyers and doctors met in Montreux in 1996. The debate continued after the meeting and the so called 'SirUS project' document was adopted offering the four criteria helping to determine whether a weapon causes unnecessary suffering:

1. specific disease, specific abnormal physiological state, specific abnormal psychological state, specific and permanent disability or specific disfigurement; or
2. field mortality of more than 25% or hospital mortality of more than 5%;
3. Grade 3 wounds as measured by the ICRC wound classification; or
4. effects for which there is no well-recognised and proven treatment.[760]

The presently known ASAT technologies can hardly cause unnecessary suffering as an indirect effect of direct ASAT attack. For instance, ASAT technologies do not spread specific diseases or mean to cause abnormal physiological or psychological state, permanent disability or specific disfigurement of a person. The effects of ASAT attacks may lead to "ordinary" casualties, such as losses of life without being able to receive the distress signal, consequences of transport accidents or critical infrastructure failure. ASAT weapons can hardly be related with a high field mortality. According to the ICRC wound classification, Grade 3 is the highest classification of wounds

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756 Dissenting Opinion of Judge Higgins, International Court of Justice, LEGALITY OF THE THREAT OR USE OF NUCLEAR WEAPONS ADVISORY OPINION OF 8 JULY 1996. 584-587.

757 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 226.

758 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 65.

759 Dinstein. 65.

760 Douglas Holdstock, Jack Piachaud, and Robin M Coupland, "The SIrUS Project: Towards a Determination of Which Weapons Cause 'Superfluous Injury or Unnecessary Suffering'" 14, no. 3 (1998): 243–49. 245.

involving massive wounds compared to Grade 1 low energy transfer or Grade 2 – high energy transfer.[761] The Grade 3 of wounds may not be reached using presently known ASAT technologies. If ASAT weapons caused indirect effects on humans, the treatment of these effects would most probably be known because, as mentioned, ASAT weapons could cause ordinary damage to the health of a human. However, it should be noted that while developing new weapon technologies states are obliged to legally review new weapons and evaluate whether their use in circumstances of armed conflict could breach IHL, including principle of unnecessary suffering (see "4. LEGAL REVIEW OF ASAT WEAPONS").

The four alternative criteria presented by ICRC are not legally bounding. The SirUS project did not propose any new laws substituting arms control legal instruments, but rather a professional opinion which may supplement to those processes.[762] Therefore, it may not be confirmed or denied that ASAT weapons (could) cause unnecessary suffering. Due to the mentioned reasons, currently known ASAT capabilities cannot be said to be able to cause unnecessary suffering because the collateral damage which may be caused by the loss of satellite signal is not significantly different from the one caused using regular military means. It is highly unlikely that a party to the conflict willing to cause great damage to humans, even in the absence of military necessity, would choose to use high-cost technologies such as ASATs. The primary purpose of ASATs is to prevent the opponent using satellite services – accurately hit targets, communicate, plan attacks, perform reconnaissance, detect missile launches and so on. Despite the unlikeliness of unnecessary suffering principle breach while using ASAT technologies, it should also be emphasized that this principle, similarly as military necessity, also requires opting less destructive means, if available, to achieve analogical military goals. For instance, as GNSS attack has high likelihood of collateral damage, it may be more humane to attack ground military object to achieve analogical military goal. If the goal is to disturb navigation of certain military unit, dependently from available means, the unit itself may be attacked instead of a GNSS satellite. If the goal is to disturb communications, ground stations or other antennas on the ground might be attacked. If the goal is to prevent smart missiles from hitting their targets, anti-missile technologies (if available) might help to achieve analogical military goal without placing civilian population and civilian objects at risk of unnecessary suffering.

761 Grades of wounds are calculated using a formula which involves various elements such as the depth of wound, bone loss significancy, etc. See Robin M Coupland, "The Red Cross Wound Classification," 2005, https://icrcndresourcecentre.org/wp-content/uploads/2016/04/The_Red_Cross_Wound_Classification.pdf.

762 Holdstock, Piachaud, and Coupland, "The SIrUS Project: Towards a Determination of Which Weapons Cause 'Superfluous Injury or Unnecessary Suffering.'" 246.

3.7. Principle of distinction and satellite targeting

3.7.1. General remarks

Targeting rules are primarily significant to the implementation of customary principle of distinction. As Solis eloquently described, "[d]istinction, the cardinal principle of LOAC/IHL, is at the heart of lawful targeting."[763] Principle of distinction, codified in IAP, reads as follows:

"In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives."[764]

As seen from the quoted Article, principle of distinction combines elements that have been discussed previously. Indeed, in context of satellite targetability, we may already indicate that satellites which are not military objectives are not targetable. It may seem that disclosure of the notion of military objective leaves this chapter without purpose or at least repetitive. However, principle of distinction covers more than only the prohibition of targeting civilian objects. It is a complex notion which may not be simply taken out of other customary targeting rules or even understood without historical context. There are many ways by which satellites actualize principle of distinction, for instance, satellite attacks producing uncontrollable effects may be indiscriminate and consequently breach this principle. The origins and the content of distinction, including *lex scripta,* state practice, jurisprudence of international courts and academic works may help to better understand its complexity. It should also be emphasized that principle of distinction in most part covers rules protecting individuals and only relatively small portion of them are specifically designed to protect objects. Only a relatively small portion of anthropocentric aspects of distinction are elaborated to contextualize this principle through history.

3.7.2. The meaning of distinction

The major IHL purpose is to ensure that throughout the hostilities civilians and civilian property are speared to the maximum extent possible. Principle of distinction serves as an operative tool to constantly maintain that purpose. The requirement to distinguish is imposed upon combatants, not civilians. Therefore, one of the functions of this principle is to practically ensure the protection of civilians as legally required by IHL.[765] In other words, the requirement to distinguish as a soldier allows to presum-

763 Solis, *The Law of Armed Conflict. International Humanitarian Law in War*. 519.

764 1977 IAP, Art. 48.

765 Yves Sandoz, "Land Warfare," in *The Oxford Handbook of International Law in Armed Conflict*, ed. Andrew Clapham and Paola Gaeta (New York: Oxford University Press, 2014), 1–1027, 4. http://www.oxfordhandbooks.com/view/10.1093/law/9780199559695.001.0001/law-9780199559695.

ably treat otherwise dressed as a civilian.[766] Therefore, principle of distinction does not merely serve as a legal requirement, but rather as an operative tool to implement IHL.

Principle of distinction is the root and the foundation of the law of targeting and the rest of IHL. ICJ called principles of distinction and unnecessary suffering as "the fabric of humanitarian law".[767] Principle of distinction has been described as "the most significant battlefield concept",[768] "most fundamental pillar" of IHL,[769] "heart of IHL"[770], "most important building block of the edifice of IHL",[771] an "intransgressible" norm.[772] According to ICJ, principle of distinction aims to protect civilian population and civilian objects by establishing distinction between combatants and non-combatants. Hence, States may never make civilians the object of attack and must consequently never use weapons that are incapable of distinguishing between civilian and military targets.[773] Principle of distinction is an expression of both customary IHL and codified IHL and does not allow for derogation.[774] In other words, no matter how great the military advantage, no matter how sound is military necessity, individual civilians, civilian population, or civilian objects may in no case be directly attacked.

3.7.3. Origins of distinction through the philosophical thought

Principle of distinction is not an innovative notion. Authors of ICRC IAP Commentary stipulate that the concept "that war is waged between soldiers and that the population should remain outside hostilities was introduced in the sixteenth century and became established by the eighteenth century. The customs of war acquired a more humanitarian character through the process of civilization and as a result of the

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766 There are many modalities under *jus in bello* under which a soldier without uniform may still be treated as a combatant (e.g. if carries a weapon openly during active combat) or be treated partly as a civilian and partly as a combatant (until a civilian takes direct part in hostilities). The Author does not seek to disclose these modalities, but merely emphasize how duty to distinct actually operates as a protective tool.

767 International Court of Justice, LEGALITY OF THE THREAT OR USE OF NUCLEAR WEAPONS ADVISORY OPINION OF 8 JULY 1996, 679, para 78.

768 Solis, *The Law of Armed Conflict. International Humanitarian Law in War*. 251.

769 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 62.

770 Nils Melzer, "Interpretive Guidance on the Notion of Direct Participation in Hostilities," 2009, 11.

771 Laura Hofmann, "Strengthening the Principle of Distinction: A Critical Appraisal of the ICRC's Continuous Combat Function," *Journal of International Humanitarian Legal Studies* 6, no. 2 (2015): 377–413, 378. https://doi.org/10.1163/18781527-00602004.

772 Michael N Schmitt, "The Principle of Distinction and Weapon Systems on the Contemporary Battlefield," *Partnership for Peace Consortium of Defense Academies and Security Studies Institutes The* 7, no. 1 (2008): 46–56. 46.

773 ICJ, Nuclear Weapons Opinion, para. 78.

774 Hofmann, "Strengthening the Principle of Distinction: A Critical Appraisal of the ICRC's Continuous Combat Function." 383.

influence of thinkers and jurists."[775] It is claimed that principle of distinction originated, or to be more precise, elucidated with medieval "just war" theory. St. Augustine emphasized that the way a war is fought determines whether peace can be achieved. With this ideology, St. Augustine is claimed to have laid the foundation for non-combatant immunity – a Christian moral imperative to be followed by the civilized.[776] However, St. Augustine did not elaborate on the notion of civilian immunity, at least to the extent that it had a normative weight.[777] Subsequent thinkers crystalized principle of distinction in more detail. Francisco de Vitoria recognized that certain classes of the population are designated immune from military attack by virtue of their absence of active participation in armed combat.[778] Hugo Grotius observed that "no action should be attempted whereby innocent persons may be threatened with destruction."[779] Hugo Grotius urged restraint with regard to children, women, old men, men performing religious duties, farmers, merchants, prisoners of war, and those who surrender.[780] However, according to Grotius, *lex lata* permitted the killing of civilians as they were enemies in a public war.[781] In contrast with Grotius, Rousseau took the view that war is a relation between governments, involving the citizens of a state only accidentally.[782] Rousseau explicitly recognized that civilians are not the enemies of an opposing army and should not be made an object of attack.[783]

Principle of distinction as it is formed by the current international law regime did not find an easy way neither through a philosophical, nor through a legal thought. Actually, it took almost a hundred years from XVIII to XIX centuries for this principle to gain full understanding stretching from the protection of persons to the additional protection of their property. The genesis of legal construct of this principle is discussed further.

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775 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 585.

776 Emily Kalah Gade, "Defining the Non-Combatant: How Do We Determine Who Is Worthy of Protection in Violent Conflict?," *Journal of Military Ethics* 9, no. 3 (2010): 219–42. 222.

777 Richard Shelly Hartigan, "Noncombatant Immunity: Reflections on Its Origins and Present Status," *The Review of Politics* 29, no. 2 (1967): 204–20. 212.

778 Hofmann, "Strengthening the Principle of Distinction: A Critical Appraisal of the ICRC's Continuous Combat Function." 385.

779 Hofmann, "Strengthening the Principle of Distinction: A Critical Appraisal of the ICRC's Continuous Combat Function."

780 Hofmann, "Strengthening the Principle of Distinction: A Critical Appraisal of the ICRC's Continuous Combat Function."

781 Emily Camins, "The Past as Prologue: The Development of the 'Direct Participation' Exception to Civilian Immunity," *International Review of the Red Cross* 90, no. 872 (2009): 853–81, 858.

782 Emily Camins, "The Past as Prologue: The Development of the 'Direct Participation' Exception to Civilian Immunity,"

783 Emily Camins, "The Past as Prologue: The Development of the 'Direct Participation' Exception to Civilian Immunity,"

3.7.4. Evolution of the principle of distinction in legal texts

Principle of distinction has been primarily codified in the already mentioned 1863 Lieber Code. Article 22 of the Lieber Code stipulates that the distinction between the private individual belonging to a hostile country and the hostile country itself, with its men in arms is a characteristic of an advanced civilization. More importantly in context of this thesis, Lieber Code implicitly indicated that not only an unarmed citizen are to be speared, but also their property as much as exigencies of war will admit.[784] Articles 37 and 38 emphasize the right of a person to private property which may be seized only by way of military necessity, for the support or other benefit of the army.[785] Similarly, wanton destruction of property not commanded by the authorized officer is punished by death or other adequate punishment.[786] Lieber Code imposed obligation for the troops to have a distinctive mark.[787] Despite the fact that Lieber Code clearly separated civilian and military targets, it did not indicate that civilian objects (opposite to civilians) are not targetable, it rather proclaimed that civilian property did not have an ultimate protection, especially in cases of military necessity.

The Preamble of the 1868 St. Petersburg Declaration states: the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy".[788] It should be noted that despite of the misleading name indicating declarative and non-binding nature of it, the 1863 St. Petersburg Declaration is an international treaty which prohibits the use of a certain weight projectiles.[789] However, the fact that the preamble of this treaty indirectly refers to the principle of distinction, does not in itself mean that this treaty (strictly speaking) creates an obligation for state parties to target only military objectives. Article 31(2) of the VCLT clearly states that the text of a treaty preamble serves rather as an interpretative tool.[790] Therefore, it may be said that the aim of the 1868 St. Petersburg Declaration is not to set certain methods of warfare (such as principle of distinction) but rather to prohibit a specific mean of warfare.

On the initiative of Czar Alexander II of Russia, delegates of 15 European States met in Brussels in 1874 to examine the draft of an international agreement concerning the laws and customs of war (hereinafter – 1874 Brussels declaration) submitted to them by the Russian Government.[791] 1874 Brussels declaration has been heavily influ-

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784 Lieber Code, art. 22.

785 Lieber Code, arts. 37-38.

786 Lieber Code, art. 44.

787 Lieber Code, art. 63.

788 1863 St. Petersburg Declaration.

789 Projectiles weighting less than 400 grammes, which are either explosive or charged with fulminating or inflammable substances.

790 *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 331.

791 Project of an International Declaration concerning the Laws and Customs of War (hereinafter - 1874 Brussels declaration draft). Brussels, 27 August 1874. Available at: https://ihl-databases.icrc.org/ihl/INTRO/135

enced by the Lieber Code.[792] The 1874 Brussels declaration emphasized the cardinal maxim of laws of war[793] and aimed prohibited any destruction or seizure of the property that is not imperatively demanded by the necessity of war.[794] It also stated that "[o]pen towns, agglomerations of dwellings, or villages which are not defended can neither be attacked nor bombarded."[795] The 1874 Brussels declaration has never come into effect because not all participating states were willing to accept it as a binding, the number of ratifications did not reach the threshold to come into force. It may be said, that the 1874 Brussels declaration is one of the early attempts (if not the first) to establish principle of distinction as a binding international rule.

After unsuccessful outcome of 1874 Conference at Brussels, the Institute of International Law in 1880 adopted the Oxford Manual on the Laws of War on Land (hereinafter – 1880 Oxford Manual)[796] the purpose of which was to specify and codify the law of war as it was recognised at the time. The Institute of International Law did not aim to propose an international treaty, but rather to offer governments the draft of laws of war which might be suitable for national legislation. The 1880 Oxford Manual was sent to European governments.[797] The 1880 Oxford Manual indicated that wars may be waged only between armed forces of belligerent states.[798] It had specific chapter dedicated to conduct in hostilities "with regard to things" prohibiting pillage of towns, destruction of public or private property no justified by military necessity or attacking undefended places.[799]

More than a decade long lingering of 1874 Brussels declaration ratification, encouraged Nicholas II once again to attempt to draft internationally binding rules of warfare. The First Hague Peace Conference was conducted in 1899 to revise the 1874 Brussels declaration and finally come up with an internationally codified laws of war.[800] In the aftermath of this Conference, three treaties and three declarations were adopted, among which, the first international treaty governing conduct of hostilities on land – 1899 Hague Convention with Respect to the Laws and Customs of War on Land and

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792 E.g. Articles: 7 and 8 clearly transpose land warfare rules from the Lieber Code to the occupation law context.

793 The right of belligerents to adopt means and methods of warfare is not unlimited. *See* "4.4.1. General remarks".

794 1874 Brussels declaration draft, art. 13(g).

795 1874 Brussels declaration draft, art. 15.

796 The Laws of War on Land. Oxford, 9 September 1880, available at:
https://ihl-databases.icrc.org/ihl/INTRO/140?OpenDocument

797 Preface of the 1880 Oxford Manual.

798 Arts.: 1, 7.

799 Art. 32.

800 Convention (II) with Respect to the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 29 July 1899. Available at : https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?documentId=CD0F6C83F96FB459C12563CD002D66A1&action=openDocument

its annex: Regulations concerning the Laws and Customs of War on Land (hereinafter – 1899 Hague Convention II). In many instances, the 1899 Hague Convention II repeated the 1874 Brussels declaration rules, making them legally bound by the signatories. For instance, 1899 Hague Convention II prohibited the attack or bombardment of undefended places,[801] imposed precaution in attacks requirements,[802] prohibited pillage of towns or places.[803]

In spite of successful adoption of three international treaties in the aftermath of the 1899 Hague Conference, there were still disagreements which had to be solved in the future. The 1899 Hague Conference failed to reach an agreement on the primary object for which it was called – the limitation or reduction of armaments.[804] Theodore Roosevelt proposed a second peace conference which was eventually held in 1907 in the Hague. In 1907, thirteen conventions and one declaration were adopted involving not only general rules of land and sea warfare, but also specific issues, such as the law of neutrality, status of merchant ships during hostilities, the laying of submarine mines, bombardment of naval forces and other.[805] These documents formed a branch of the law of war regulating means and methods of warfare which decades after became known as "the Hague law" distinguishing the part of the law of war setting standards of protection of the victims of the armed conflict, known as "the Geneva law".[806] One of the treaties adopted in the 1907 Hague Peace Conference - 1907 Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land (hereinafter – 1907 Hague Convention IV) – had only few slight differences from 1899 Hague Convention II.[807] These differences did not make both documents concurrent, but rather the 1907 Hague Peace Conference repleted. Notions prohibiting bombardment of undefended places or destruction of enemy's property not justified by imperative military necessity are repetitive in both documents, however, we could state that they both gave birth to an internationally recognized legal principle of distinction forming the essence of targeting rules.

Despite the fact that Hague Conventions did elaborate on certain prohibitive methods of warfare, they did not disclose peculiarities of the principle of distinction, such as what would be the status of a person failing to meet the requirements of a combatant

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801 Ibid. Art. 25.

802 Ibid. Art. 27.

803 Ibid. Art. 28.

804 Final Act of the Second Peace Conference. The Hague, 18 October 1907, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?documentId=F1DE61E43D5E0F6BC12563CD002D675C&action=openDocument.

805 Ibid.

806 See 'Law of Geneva', *How Does Law Protect in War*, ICRC, https://casebook.icrc.org/glossary/law-geneva; 'Law of the Hague', *How Does Law Protect in War*, ICRC, https://casebook.icrc.org/glossary/law-hague.

807 Some states which ratified the 1899 Hague Convention II chose not to ratify 1907 Hague Convention IV due to duplicating texts of both of the documents.

or the one directly participating in hostilities or how should civilian buildings and other property be treated in case there was or there was no sufficient evidence on their military use ("undefended" or "defended" in Hague treaty language). According to the authors of ICRC IAP Commentary, the rule of protection of civilians and civilian objects in the 1899 Hague Convention II and 1907 Hague Convention IV is deemed to be generally accepted as a rule of law, though at that time it was not considered necessary to formulate it word for word in the texts themselves.[808] There was no such need until the First World War when civilian areas faced a radical aircraft bombardment. By way of reprisals, attacks during both world wars were systematically directed at towns and their inhabitants.[809]

The forthcoming "Geneva law" treaties, including 1949 IV Geneva Convention protecting civilians, with only few exceptional clauses, aimed to regulate protection of civilians, not conditions of targeting property (at least directly). The few exceptional clauses of 1949 IV Geneva Convention indirectly related to the law of targeting involve protection of hospitals,[810] land, sea and air transport.[811] However, they do not disclose targeting limits or even do not define what constitutes a civilian, civilian population or a civilian object. Despite this, it should be mentioned that it was the first time when the notion "civilian" in the 1949 IV Geneva Convention has been introduced in an IHL treaty base. This and other related notions (such as civilian object) are key categories framing principle of distinction. However, all treaties lacked clarity.

In 1974, CDDH was conducted by the initiative of ICRC to clarify and update both, "Geneva law" and "Hague law" rules. CDDH was wreathed with two innovative and detailed international treaties – the IAP and the IIAP. Among other innovative notions scripted in those treaties, IAP introduced 25 new articles specifically regulating conduct in hostilities. Not only it defined what the notion of military objective, but placed numerous new targeting notions and mechanisms related to the implementation of customary IHL principles, such as prohibition of indiscriminate attacks, presumption of civilian objects, protection of objects indispensable to the survival of the civilian population, protection of environment, works and installations containing dangerous forces, duties of attacking parties prior to attacks (such as precautions in attacks) or duty to legally review new weapons. The major rules of IAP were transposed to national military manuals. Many targeting rules are claimed to have attained customary status, including those requiring strict compliance with the principle of distinction. Further Chapter discloses the content of principle of distinction as it is inscribed in IAP as far as it is related to targeting (as opposed to the targetability).

808 ICRC IAP Commentary, 598.

809 Ibid.

810 GC IV, art. 18;

811 GC IV, arts. 21-22.

3.7.5. Principle of distinction in the IAP

Authors of the ICRC IAP Commentary wrote: "It is the foundation on which the codification of the laws and customs of war rests: the civilian population and civilian objects must be respected and protected in armed conflict, and for this purpose they must be distinguished from combatants and military objectives. The entire system established in The Hague in 1899 and 1907 and in Geneva from 1864 to 1977 is founded on this rule of customary law."[812] Article 48 of the IAP, which has already been quoted (see "2.2 Targetability of satellites and the notion of military objective"), codifies principle of distinction. It requires for the parties to the conflict not only to distinguish from civilian population and civilian objects, but also direct their operations only against military objectives. This principle is customary and applied to both, individuals and objects. For instance, rule 7 of the ICRC Customary IHL study states that the "parties to the conflict must at all times distinguish between civilian objects and military objectives. Attacks may only be directed against military objectives. Attacks must not be directed against civilian objects."[813]

Important to notice, the content of principle of distinction applied towards individuals and objects differ. While individuals who take the combat position are required to distinguish from civilians, that is, have distinctive signs and carry their weapons openly, military objects legally need not to distinguish from civilian objects, although, they often do. For instance, military objects by nature, such as the military equipment or transportation, may often be distinguished from civilian objects because such an equipment is either not accessible to civilians due to national legal restrictions (e.g., fully automatic rifles) or its specific military purpose is useless in civilian environment (e.g., no need to have an armoured vehicle to transport goods). However, as was discussed earlier (see "2.2.1 Objective element of military objective"), military objectives do not only qualify as such only by nature. It would neither be practical nor tactically justifiable to require to specifically mark dual-use objects or purely civilian objects used by the military. Neither a satellite, nor its components need to have certain military insignia. Therefore, the requirement to physically distinguish rests only upon individuals, not objects. It should be recalled that under Registration Convention, all objects launched into outer space among other registry entries should include general function of the space object. However, this general duty does not require the states to disclose specific military information about a satellite or mark it as a military objective. In this case, the two requirements under IHL and ISL, namely, duty to distinguish and duty to indicate general function of an object when launching it into space do not contradict one another.

IHL imposes duty on a party to the conflict to take active steps to identify that a potential target is a military objective. This is where military precautions, often held as a separate principle of IHL, take part in implementation of principle of distinction. In

812 ICRC IAP Commentary, 598.

813 Henckaerts and Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.* 25.

this context, we would not be mistaken to discuss certain military precautions as part of the principle of distinction.

3.7.6. Precautions in attacks

Article 57(1) of the IAP impose a general obligation on parties to armed conflicts to conduct their military operations with constant care to spare civilian population, civilians, and civilian objects. In other words, any military operation should involve not only military gain, but also civilian loss considerations. Every measure taken prior to attacks requires constant attention to civilian environment and in that sense, precautions in attacks may not only be considered as the specific targeting requirement, but also a derivative or even a constituting part of the principle of distinction. In that case, each attack on dual-use objects, including most of the satellites, should only be implemented with constant care considerations of sparing civilians and civilian objects.

Article 57(2) lists obligations upon those who plan or implement attacks. The first obligation listed in Article 57(2)(2)(i) is to "do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives <…>". According to Bourbonniere, this is an obligation of means and not an obligation of results.[814] If there is a doubt that a civilian object is being used to make an effective contribution to military action, it must be presumed not to be so used and must not be attacked. Requirement of military precautions is not an innovative notion compared to the pre-IAP law because it aims to ensure the essential requirement of the principle of distinction – it is allowed to target only military objectives during military operations. As Quéguiner noted, "this provision is clearly a codification of existing law."[815] Few remarks are given further to disclose this rule.

Firstly, this rule requires precise identification of a target. Accordingly, no attacks shall be implemented in large distance without actually knowing the exact nature and purpose of an object, its location's military significance or the fact that the object is used for military purposes. Authors of the ICRC IAP Commentary emphasize particular importance of identification of the targetable long-distance objectives.[816] They argue that those who plan or decide upon attacks should base their decision on information given to them. And in case there "is only slight doubt" on the status of the targetable object, targeting decision makers should call for additional information, give orders for further reconnaissance.[817] The evaluation of information obtained must include a serious check of its accuracy, particularly as there is nothing to prevent the

814 Bourbonniere, "Law of Armed Conflict (LOAC) and the Neutralisation of Satellites or Ius in Bello Satellitis." 48.

815 Jean François Quéguiner, "Precautions under the Law Governing the Conduct of Hostilities," *International Review of the Red Cross* 88, no. 864 (2007): 793–821. 797.

816 ICRC IAP Commentary, 680.

817 ICRC IAP Commentary.

enemy from setting up fake military objectives or camouflaging the true ones.[818] This rule applied, even though satellites are distant objects compared to those on the ground, the attacking party should only attack them if their military status is confirmed. The distance or inability to check the status of a distant object such as the satellite may not in any way justify derogation of this rule.

Secondly, this is not an absolute rule, because it requires only to "do everything feasible." During the CDDH adopting IAP, some delegations noted that they understood that notion as to do everything that is practicable or practically possible, taking into account all the circumstances at the time of the attack, including those relevant to the success of military operations.[819] Authors of ICRC IAP Commentary criticized that view, because "by invoking the success of military operations in general, one might end up by neglecting the humanitarian obligations <…>."[820] Feasibility also connotes to the availability of means enabling prudent identification of a target. Belligerents are not required to possess the newest and most modern military equipment for target identification, this obligation rather requires the prudent use of means available to the belligerent at the time. Authors of the ICRC IAP Commentary accept that view.[821] Authors of Bothe's IAP Commentary note that feasibility involves a continuing obligation to assign a high priority to the collection, collation, evaluation, and dissemination of timely target intelligence. This is because the opposing party is expected to employ ruses of war to conceal, deceive and confuse reconnaissance means.[822] While determining feasibility, it is important to establish the guilty state of mind because in some cases, even the prudent gathering of information and calculated selection of targets might lead to mistakes. In this context, Fenrick states that duty to take precautionary measures is not absolute. It is a duty to act in good faith to take practicable measures, and persons make mistakes even acting in good faith.[823] The practicality of precautions is clearly established in the Article 3(4) of the Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and other Devices (hereinafter – II Protocol of CCW) of the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects as amended on 21 December 2001 (hereinafter – CCW): "Feasible precautions are those precautions which are practicable or practically possible taking into account all circumstances ruling at the time, including humanitarian and military considerations." Dinstein describes feasible precautions as requirement to due diligence and acting in good faith since there is no way to ascertain with absolute

818 ICRC IAP Commentary, 681.

819 ICRC IAP Commentary, 681-682.

820 ICRC IAP Commentary, 682

821 ICRC IAP Commentary.

822 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 406.

823 W.J. Fenrick, "Targeting and Proportionality during the NATO Bombing Campaign against Yugoslavia," *European Journal of International Law* 12, no. 3 (2001): 489–502. 501.

certainty the military character of an objective selected for attack.[824] Satellite attacks may not be implemented merely by presuming an object to be military. The attacking party should use all available practical sources to identify that a specific satellite is a military objective.

Thirdly, this rule requires not merely evaluation of target's characteristics, but verification whether the objects concerned are civilians, civilian objects, including objects subjected to special protection, such as cultural objects, objects indispensable to the survival of the population, dangerous forces or places of worship.[825] Targets should not be simply estimated, but verified by the actual information gathered by reconnaissance or from actual combat units in the field. Some States made reservations on this rule. For instance, Austria declared that Article 57(2) will be applied on the understanding that, with respect to any decision taken by a military commander, the information actually available at the time of the decision is determinative.[826] Belgium made a reservation with respect to whole Part IV of IAP stating that "the only information on which that decision can possibly be taken is such relevant information as is then available and that it has been feasible for him to obtain for that purpose."[827] Canada, similarly, understands that information needs to be "reasonably available to them [military commanders] at the relevant time and that such decisions [for planning, deciding upon or executing attacks] cannot be judged on the basis of information which has subsequently come to light."[828] Netherlands emphasized the importance of using all available sources: "military commanders and others responsible for planning, deciding upon or executing attacks necessarily have to reach decisions on the basis of their assessment of the information from all sources which is available to them at the relevant time."[829]

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824 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 139.

825 ICRC IAP Commentary, 680.

826 "Reservations of Austria for Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977.," 1982, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=C5CD201B43C3E56AC1256402003FB262.

827 "Belgium Interpretative Declarations Made at the Time of Ratification of Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," 1986, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=EA2560B9B790488EC1256402003FB2BC.

828 "Canada Reservations Made at the Time of Ratification of Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," 1990, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=172FFEC04ADC80F2C1256402003FB314.

829 "Netherlands Declarations Made at the Time of the Ratification (for the Kingdom's Territory within Europe and the Netherlands Antilles and Aruba) on the Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Vict," 1987, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=E6EF925C67966E90C1256402003FB532.

Other states (Algeria,[830] Germany,[831] Ireland,[832] and Italy[833]) made similar reservations. According to Dinstein, in the fog of war which surrounds military operations the information on which precautions in attack are based cannot be fool proof. It is required that such information was up to date, there were no prolonged lags in making decisions upon information.[834] In context of satellite attacks, it is important to use reliable sources and the major task of attack planners is to do everything feasible to confirm that a satellite to be targeted is not a civilian object.

The second rule laid down in Article 57(2)(a)(ii) requires prudence in the choice military equipment. It states that those who plan or decide upon an attack shall "take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects." As regards to weapons, the range and precision should be taken into account.[835] For instance, the use of long-range surface-to-surface primitive and inaccurate SCUD missiles by Iraq on Israel is a classic example of *jus in bello* breach not only in the context of indiscriminate attacks' prohibition, but also failure to take feasible precautions as mentioned in Article 57.[836] However, it should also be noted that circumstances of combat, the control of airspace, the size of an object and other peculiarities of warfare should be taken into account while estimating legality of a specific attack. For instance, Schmitt gave an example with certain level of legitimacy in the use of SCUDS, if they were used against large military installations, such as Dhahran Airfield in Saudi Arabia.[837] In context of ASAT means, if an attacking state possessed other than kinetic ASAT weapon having less destructive effects albeit offering similar military advantage, it would be bound to use it instead of a kinetic weapon.

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830 "Algeria Interpretative Declarations Made at the Time of Accession of the Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," 1989, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=983A7615F773CFC7C1256402003FB232.

831 "Germany Declarations Made at the Time of Ratification of Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977.," 1991, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=3F4D8706B6B7EA40C1256402003FB3C7.

832 "Ireland Declarations and Reservations in Relation to Additional Protocol I," 1999, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=27BBCD34A4918BFBC1256402003FB43A.

833 "Italy Declarations Made at the Time of Ratification of the Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," 1986, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=E2F248CE54CF09B5C1256402003FB443.

834 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 139-140.

835 ICRC IAP Commentary. 682.

836 Peter Barber, "Scuds, Shelters and Retreating Soldiers: The Laws of Aerial Bombardment in the Gulf War," *Alberta Law Review* 31, no. 4 (1993): 662–91. 686-687.

837 Schmitt and Widmar, "'On Target': Precision and Balance in the Contemporary Law of Targeting." 398.

The third rule inscribed in Article 57(2)(a)(iii)) codifies principle of proportionality which is discussed separately in the following chapter.

Article 57(2)(b) requires the attack to be cancelled or suspended if it becomes apparent that the objective is not a military one or is subject to special protection or the attack would be disproportionate. This rule is rather unambiguous. The authors of the ICRC IAP Commentary stated that the "text is sufficiently clear for lengthy comment to be superfluous."[838] It is highly unlikely that with the amount of human and financial resources involved in ASAT weapons the status of the satellite aimed to target appeared surprisingly different from the one expected making it a military objective. On the other hand, this rule requires special focus in making targeting decisions on objects in a long range or in visually difficult environment. Authors of the ICRC IAP Commentary note that "with the increased range of weapons, particularly in military operations on land, it may happen that the attacker has no direct view of the objective, either because it is very far away, or because the attack takes place at night. In this case, even greater caution is required."[839] However, in this context, it should be emphasized that this obligation applies to all operational levels, not only the planning of attacks. In case the pilot notices that the target which is commanded to be destroyed has actually a protective status, he/she must not implement the attack. According to Quéguiner, the Article 57(2)(b) provision must be interpreted as imposing a special and personal obligation on all members of the armed forces to cancel or suspend an attack when they acquire, int the course of an operations, information that was not available at the planning stage.[840] Quéguiner notes that it "is not sufficient to assert that those who carry out the attack must assume that the planners and deciders have correctly assessed the situation and that all that is required of them is faithfully to follow the instructions they have received."[841]

One of the requirements which, to some extent, impedes the achievement of military goals, is the requirement to give effective advance warning if the planned attack may affect the civilian population (Article 57(2)(c)). In many cases, a surprise attack in an armed conflict is a condition of success. Naturally, the advance warning requirement is not left without exceptions, as the text indicates "unless circumstances do not permit." The examples of warnings include: towns subject to attacks were declared open cities,[842] roof knocking,[843] dropping warning leaflets from planes.[844] It should be borne in mind that the text of Article 57(2)(c) requires effective advance warning. It

838 ICRC IAP Commentary, 686.

839 Ibid.

840 Quéguiner, "Precautions under the Law Governing the Conduct of Hostilities." 803-804.

841 Quéguiner. 805.

842 Ibid.

843 *See* Avner Shemla Kadosh, "The Practice of 'Roof Knocking' from the Perspective of International Law," *Strategic Assessment - A Multidisciplinary Journal on National Security* 24, no. 4 (2021): 61–77.

844 Atomic Heritage Foundation, "Warning Leaflets," n.d., https://www.atomicheritage.org/key-documents/warning-leaflets.

is questionable whether it would be sufficient to give an abstract warning consisting of a list of the various types of infrastructure to be military objectives.[845] The level of precision of the advanced warning required will depend on the general objective pursued – the attacking party must ensure the least collateral damage possible to the civilian population and civilian property. Therefore, if the target is an infrastructure that is essential for public service and is staffed almost permanently by civilians, the warning must be more specific.[846] For instance, targeting GNSS constellations would require effective advance warning to civilians suggesting that possible outcomes of the attack could lead to disruption of air and ground transportation or failure of infrastructure using satellite time. The timing of the warning is also import. During the 2006 Israeli-Lebanon armed conflict, in some cases Israeli Defence Forces reported to have dropped leaflets or given loudspeaker warnings only two hours before a threatened attack. Having given a warning, the actual physical possibility to react to it must be considered.[847] The warning needs not to be issued not too late and not too early which may lead civilians to believe that the threat is no longer real.[848] Many circumstances need to be observed when making decisions on warning timeline. For example, if a satellite which provides essential services for long range aircraft flights is targeted, it may seem reasonable to give advance warning prior the time that would take for the longest flight to finish so as the aircrafts in the air were able to finish their flights or those which have not yet taken off did not take off.

Satellites can hardly avoid kinetic ASAT missiles which track the movement of the target. Satellites are not able to neither defend themselves, nor move easily in orbits. Manoeuvring of a satellite means the loss of fuel which reduces the satellite's life span. For instance, the Russian satellite Luch Olymp has spent its entire on-orbit life parking next to operational communications satellites throughout the geostationary arc.[849] It would seem unreasonable to argue that advance warning is not given because "circumstances do not permit" to disclose military plans, because a satellite could somehow avoid the kinetic kill vehicle and the attack would fail. State practice shows that advance warning is often given prior to the attacks which target immovable objects. Usually, these are buildings, installations, infrastructure which may not be moved and covered from the targeting field. A satellite may not change its position so fast as to avoid a fast-moving ICBM blast. The fact that a satellite will face devastating effects is clear as soon as a kinetic ASAT weapon is launched, unless there are issues with the ASAT launch itself. There is hardly any need to hide information from public that a satellite is about

845 Quéguiner, "Precautions under the Law Governing the Conduct of Hostilities." 808.

846 Quéguiner. 808.

847 "Report of the Commission of Inquiry on Lebanon Pursuant to Human Rights Council Resolution S-2/1," n.d.

848 Quéguiner, "Precautions under the Law Governing the Conduct of Hostilities." 809.

849 Kimberly Brinson, "How Satellites Avoid Attacks And Space Junk While Circling The Earth," Forbes, https://www.forbes.com/sites/oracle/2018/07/02/how-satellites-avoid-attacks-and-space-junk-while-circling-the-earth/.

to be attacked because the destruction of a satellite does not depend by action of an opponent and most importantly, the advance warning could help prevent civilian casualties – aircraft flights might be delayed or replanned, infrastructure control (if possible) might be switched to manual control mode, etc. Therefore, in many cases, the exception "circumstances do not permit" is inapplicable to satellite targeting. On the other hand, if the advance warning would essentially impede the set military goal, for example, an opponent knowing the upcoming threat would rearrange in the way as to avoid negative outcomes of satellite attack, the advance warning may not be given.

Article 57(3) imposes obligation to choose the military objective that involves the least danger to civilian lives and civilian objects. In other words, when there are several military objectives and the military advantage of the destruction of each is very similar, the selected objective should be the one the attack on which may be expected to cause the least danger to civilian lives and to civilian objects. For example, if it is necessary to cut telecommunication lines and there are multiple locations where such goal may be achieved (such as densely inhabited or uninhabited areas) the target with least collateral effects should be chosen. In context of satellite attacks, attacking satellite ground stations to disrupt uplink or downlink signals would not only be more cost-efficient but also in many instances would cause less collateral damage than if the satellites themselves were attacked. Careful selection of targets should also be followed by careful consideration of the impact of various available weapons. The range of weapons, their accuracy, the radius of effect, as well as weather conditions, terrain or time of the day should also be considered.[850]

Military precautions require not only the prudent planning of attacks to spare civilians but also considerations of the effects of attacks. Article 58 of the IAP lists the following obligations: the parties to the conflicts should remove civilians and civilian objects under their control from the vicinity of military objectives, avoid locating military objectives within or near densely populated areas and take other necessary precautions to protect civilians. Therefore, it may be said that not only the attacking party is bound by precautionary measures, but as well as the attacked one. Most importantly, any party to the armed conflict controlling a civilian satellite should avoid locating it in close proximity to the military satellite and in this way render military satellites relatively immune from attacks. For instance, if a state conducted rendezvous operation by one of its civilian satellites merely to block the path of opponent's attack (such as electromagnetic wave attack) on its military satellite, such manoeuvre would most certainly pose threat to the civilian satellite, probably rendering it a military objective as well.

The afore mentioned precautionary rules and satellite targeting considerations allow to make certain conclusions. Precautions in satellite attacks are bounding as to any other targeting operations. However, targeting distance and inability to manoeuvre fast and escape the attack are the reasons why some of precautions are easier to follow than in most cases on land warfare. Precautions in satellite attacks require precision in

850 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 141.

identifying the type of a satellite. This may be achieved by analysing all relevant information and, if needed, obtaining more to conclude satellite targetability. It is important to verify prior the attack that a satellite is not a civilian object. A party to the conflict should take all feasible precautions in choice of means and methods of satellite attack to avoid or minimize collateral damage. A party to the conflict should consider attacking satellites at the time or a place of least collateral damage (including the cascade effects of the attack). For instance, targeting a satellite at the point in orbit over high seas (where relatively less users reach satellite signals) or at night (when most of the sea, land or air traffic is inoperative) could cause less collateral damage than doing the opposite. Lastly, since satellite movement is calculable and predictable, they can hardly escape attacks. Therefore, the excuse "unless circumstances do not permit" is less relevant while implementing obligation to give effective warning. It is recommendable to give clear advance warning to civilians of the opposing party which may be affected by a specific satellite attack.

3.7.7. Indiscriminate attacks

Prohibition of indiscriminate attacks is a derivative, or as Bourbonniere calls it, "the corollary of the principle of distinction."[851] Contrary to direct attacks against civilians, perpetrators of indiscriminate attacks do not seek to harm civilians, at least directly. They simply are not concerned whether they are injured while IHL, as noted previously, requires constant care of civilians. Indiscriminate attacks are defined in the Article 51(4) of IAP and involve three types of attacks. These are the attacks 1) that are not directed at a specific military objective; 2) which employ a method or means of combat which cannot be directed at a specific military objective; or 3) which employ a method or means of combat the effects of which cannot be limited and consequently, in each such case, are of a nature to strike military objectives and civilians or civilian objects without distinction. Article 51(5) gives two examples of indiscriminate attacks which do not limit in any way other types of indiscriminate attacks: 1) an attack by bombardment which treats as a single single military objective a number of clearly separated and distinct military objectives located in an area containing a high level of concentration of civilians or civilian objects; and 2) an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated. This part of thesis focuses on the three types of indiscriminate attacks and they are discussed further.

The first type of indiscriminate attacks inolve attacks which are not direteced at a specific miltary objetive. This conotes to the already analysed definition of the miltiary objective. We may accordingly say that directing an intentional attack against an object which does not meet the requirements of a military objective legally qualifies as

851 Bourbonniere, "Law of Armed Conflict (LOAC) and the Neutralisation of Satellites or Ius in Bello Satellitis." 48.

an indiscriminate attack. Should the attack on a civilian or civilian object, such as Ionospheric Connection Explorer, consittute an indiscriminate attack? The text of IAP 51(4)(a) would suggest that it would, however, we may question the necessity to include this type of attack if other IAP articles prohibit intentional attacks on civilians and civilian objects (IAP articles 48, 51(2), 52). For the attack to fall under the first type of indiscriminate attacks, it must involve the use of targeting means in the way that they are not directed at a specific military objective. Boothby notes, the "fact that the weapon is capable of discriminating use is not the issue in relation to this part of the rule. Rather, the rule is concerned with how the weapon is actually fired or used, and if the weapon is not in fact directed at a specific military objective the rule is breached." A blind fire where the attacker attacks without a clear idea of the nature of the target[852] or, similarly, bombardment of random enemy areas[853] are the common examples of this type of indiscriminate attacks. Therefore, the text of IAP defining the first type of indiscriminate attacks should be interpreted not merely as intentional attacks on civilian objects, but rather as intentional failure of attacking military objectives.

An interesting interpretation of this rule has been presented by ICTY in *Galić* case, where the Trial Chamber stressed that indiscriminate attacks which strike civilians or civilian objects and military objectives without disctintion, qualify as direct attacks against civilins.[854] In other words, all attacks on civilians or civilian objects are also indiscriminate attacks. The Author does not entirely agree with such an interpretation. Firstly, as mentioned, direct attacks on civilians and civilian objects are prohibited in other parts of the IAP. Secondly, from the linguistic point of view, indiscriminate attack should mean the attack which does not discriminate between civilian and military objectives. An intentional attack on civilians or civilian objects is discriminate in nature (albeit unlawful) – it does target a specific group of people or objects – and in that sense, may not be called as indiscriminate. Thirdly, "not directed at a specific military objective" does not mean "directed at a specific civilian objective". The notion "not directed at a specific miltary objective" could mean that it is directed at an objective, the status of which is unknown, or directed at the whole area but not a specific objective, or directed at an area where both military and civilian objects are present, or directed at the area without having any military purpose. Hense, an essential element of all indiscriminate attacks is failure to discriminate (distinguish) between civilian and military objectives. For instance, an attack on a civilian satellite is an attack on a civilian object and not necessarily an indiscriminate attack. However, the use of ASAT means capable of destroying or damaging multiple satellites (such as was used during the Starfish Prime test) could lead to qualification of indiscriminate attacks under art. 51(4)(a).

The second type of indiscriminate attacks (IAP art. 51(4)(b)) involves the use of

852 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 127; Boothby, *The Law of Targeting*. 92;

853 Ibid.

854 Prosecutor v. Galic, IT-98-29-T, 5 December 2003, para. 57.

means and methods of warfare which cannot be directed at a specific military objective. It is virtually knowledgable that the term "means of combat" generally refers to the weapons being used, while "methods of combat" refers to the way in which such weapons are used. As regards the prohibition of the use of the indiscriminate weapons, it firstly applies to the weapons of low accuracy. The ICRC IAP commentary gives an example of notoriously inaccurate V2 rockets used at the end of the Second World War.[855] Bothe's IAP Commentary adds free floating ballons attached with incendiary or antipersonnel bombs, the use of long range missiles with only a rudimentary guidance system, land mines, laid without customary precautions, unrecorded, unmarked or unable to destroy themselves within a reasonable time.[856] ICTY in *Martić* trial judgment recognized M-87 Orkan cluster munitions as indiscriminate by virtue of its characteristics and the firing range being a non-guided high dispertion weapon.[857] In few instances, for example, ICTY held that the fact of shells not landing progressively closer to the military target indicated that the attack was indiscriminate.[858] Interestingly, in *Kupreškić* trial judgment ICTY acknowledged the exingency of collateral damage in the aftermath of attacks, however, stressed that if such collateral damage was repetative and "in gray zone" of proportionality, it might constitute an indiscriminate attack.[859] In other words, repetative attacks when military advantage does not evidently overweight the collateral damage of such attacks may constitute indiscriminate attacks, even though the proportionality of the attack test is not proven. Such statement is debatable. It seems in *Kupreškić* ICTY tried to create a new standard of indiscriminate attacks which are neither disproportionate, nor blindly directed or uncontrolled. It should be noted that this position was criticized in the Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia stating: "[t]his formulation in *Kupreškić* can be regarded as a progressive statement of the applicable law with regard to the obligation to protect civilians. Its practical import, however, is somewhat ambiguous and its application far from clear. It is the committee's view that where individual (and legitimate) attacks on military objectives are concerned, the mere cumulation of such instances, all of which are deemed to have been lawful, cannot *ipso facto* be said to amount to

855 ICRC IAP Commentary. 621.

856 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 346.

857 Judgement, *Prosecutor v. Martic* (IT-95-11-T), Trial Chamber, para. 463.

858 Galic trial judgement, paras. 344-345.

859 ICTY elaborated: "it may happen that single attacks on military objectives causing incidental damage to civilians, although they may raise doubts as to their lawfulness, nevertheless do not appear on their face to fall foul *per se* of the loose prescriptions of Articles 57 and 58 (or of the corresponding customary rules). However, in case of repeated attacks, all or most of them falling within the grey area between indisputable legality and unlawfulness, it might be warranted to conclude that the cumulative effect of such acts entails that they may not be in keeping with international law. Indeed, this pattern of military conduct may turn out to jeopardise excessively the lives and assets of civilians, contrary to the demands of humanity." Judgment, *Prosecutor v. Kupreskic* (IT-95-16-T), Trial Chamber, para. 526.

a crime. The committee understands the above formulation, instead, to refer to an overall assessment of the totality of civilian victims as against the goals of the military campaign."[860] Lets assume that a specific attack on GNSS satellite is conducted at night to cause less collateral damage in the signal covering area, however, certain amount of collateral damage is still caused but not evidently disproportionate. Identical attacks are launched few days in a row. Bearing in mind the fact that disproportionate attacks constitute indiscriminate attacks, it would be legally incorrect to treat each attack discriminate in nature, however, taken all attacks altogether – indiscriminate. Discriminate attacks do not accumulate to indiscriminate ones. There is no such standard in IHL and each attack (or type of attack, see "3.8.4.1. Assessment of military advantage") should be evaluated separately.

The third type of indiscriminate attacks involve the use of means and methods the effects of which cannot be limited as required. As authors of Bothe's IAP Commentary described, this type of indiscriminate attacks "the most important and most controversial."[861] During the drafting process of IAP, many delegations were of the view that the definition of indiscriminate attacks was not intended to mean that there are means or methods of combat whose use would involve an indiscriminate attack in all circumstances. Rather, it was intended to take account of the fact that means or methods of combat which can be used perfectly legitimately in some situations could, in other circumstances have effects that would be contrary to some limitations contained in IAP, in which event their use in those circustances would involve an indiscriminate attack.[862] However, authors of ICRC IAP Commentary indicate that there are some means of warfare the effects of which cannot be limited in any circumstances, such as bacteriological means of warfare.[863] It is different from such means as fire or water which, depending on the circumstances of their use, can have either a restricted effect or, on the contrary, be completely out of the control of those using them. According to the authors of the ICRC IAP Commentary, the nature of means used is not the only criteriion: the power of the weapons used can have the same concequences. For instance, a 10 ton bomb used to destroy a single building would inevitably cause extensive effects, annihilate or damage neighbouring buildings, while a less powerful missile would suffice to destroy the building.[864] The example elaborated previously of choosing an extremely powerful bomb to

860 "Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia," 2000, at 52, https://www.icty.org/en/press/final-report-prosecutor-committee-established-review-nato-bombing-campaign-against-federal.

861 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 246.

862 Federal Political Department, "Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts," vol. XV (Bern, 1978), p. 274, para. 55. https://tile.loc.gov/storage-services/service/ll/llmlp/RC-records_Vol-15/RC-records_Vol-15.pdf.

863 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 623.

864 Pilloud et al. 623.

target one satellite also fits the commented rule. There are also methods which by their nature have an indiscriminate character, such as poisoning wells.[865] Chemical weapons is another example of indiscriminate weapons by their nature – the poisonous chemical compounds spread in the air dependently from weather or other condictions may not be controlled by a human being. The third type of indiscriminate attacks involve not only uncontrollable effects of weapons, but also the methods used. This is important to stress because some weapons do not cause uncontrollable effects *per se,* but the way in which they are used – might. For instance, cluster munitions might be discriminate if they were dropped at the large military compound outside of urbanized areas whereas the same weapon may be indiscriminate if targeted a military objective in the proximity of civilian infrastructure. Similarily, causing fire of a military objective in distance to civilian objects might be legitimate in terms of indiscriminate attack prohibition, however, burning down the whole area in which several military objectives are located might fail the indiscriminate attack test. It is not the cluster munition or the fire as a weapon that cause indiscriminate effects, but rather their use without due regard to potential civilian casualties or damage to civilian objects.

All three types of indiscriminate attacks have one essential and common element – a threat to civilians or civilian objects caused by omission to adequatly spare civilians and civilian objects. An attack may not be indiscriminate without an essential "civilian" element in the conduct. This is probably the reason the prohibition of indiscriminte attacks is incorporated into the IAP chapter of protection of civilian population.

Prohibition of indiscriminate attacks is relevant in targeting satellites. Kinetic ASATs create vast amounts of uncontrolled debris. Same logic as with cluster munitions or uncontrollable fire applied, it is not the missile itself that cause uncontrollable effects after a satellite hit, but the fact the this weapon is used in a sophisticated environment which makes an attack indiscriminate. The environment of space is unique – the kinetic force in it is so great that the effects of collisions are unpredictable and unctonrolable and this environment is not able to easily repair itself. On the other hand, it should be noted that the effects of a kinetic ASATs are not always entirely uncontrollable. For instance, the 2008 ASAT test conducted by USA targeted a relatively low-altitude (200 km) satellite which was the reason why most of the debris burnt in the atmosphre within a month and the last debris re-entered the atmosphere 18 months after the test.[866] However, it does not mean that the entry of the last debris was somehow planned or predicted and the statement that in some instances kinetic ASATs are controlable is very condictional. Usually, it is not the effect of an ASAT, but an effect of the method in which an ASAT is used that makes it an indiscriminate. If we could measure the level of "discrimination" in attacks, would might as well say that the more crowded the orbit with satellites, the more indiscriminate the attack would be. Bourboniere notes that "targeting of a satellite within a crowded geostationary orbit becomes more problematical. On the other hand

865 Pilloud et al. 623.

866 Jim Wolf, "U.S. Satellite Shootdown Debris Said Gone from Space," Reuters, 2009, https://www.reuters.com/article/us-space-usa-china-idUSTRE51Q2Q220090227.

a telecommunication satellite within a less cluttered orbit such as a Molniya orbit is less problematical. However, the targeting of telecommunication satellites within the LEO orbit once again become problematical as this orbit is shared by many nations."[867] The use of a highly powerful weapon capable of destroying or otherwise disrupting functions of other than the targeted satellite alone, especially in crowded orbits, is likely to constitute an indiscriminate attack if it was shown that such weapon was specifically chosen to cause damage to other objects or if such weapon was used blindly without actually targeting a specific military objective.

The qualification of satellite attacks as indiscriminate in most cases would depend on circumstances such as the weapon used, the way they are used, the number of objects in the orbit or the altitude of the satellite.

3.7.8. Applying distinction to satellite targeting

IHL does not require to specifically mark or register satellites. Although, Registration Convention imposes obligation on states to indicate their launching satellite's general function, however, the precise purpose or other characteristics distinguishing military satellites from other are not subjected for identification neither under IHL, nor ISL. Data provided by states under Registration Convention vary and the "general function" of an object launched into space is often described superficially. For instance, USA classifies general functions of the launched space objects into five groups, however, none of these groups indicate the military nature of a launched object.[868] According to Russian 2022 October registration data, some satellites are identified as "dual-use space object intended to perform tasks on behalf of the Ministry of Defence of the Russian Federation and to support the socioeconomic development of the Russian Federation", others as "Space object intended for assignments on behalf of the Ministry of Defence of the Russian Federation"[869] Indeed, Russia provides more

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867 Bourbonniere, "Law of Armed Conflict (LOAC) and the Neutralisation of Satellites or Ius in Bello Satellitis." 65.

868 A - Spacecraft engaged in investigation of spaceflight techniques and technology; B - Spacecraft engaged in research and exploration of the upper atmosphere; C - Spacecraft engaged in practical applications and uses of space technology such as weather or communications; Spent boosters, spent manoeuvring stages, shrouds and other non-functional objects; E - Reusable space transportation systems. See The Permanent Mission of the United States of America to the United Nations (Vienna), "Information Furnished in Conformity with the Convention on Registration of Objects Launched into Outer Space. Note Verbale Dated 7 November 2022 from the Permanent Mission of the United States of America to the United Nations (Vienna) Addressed to the Sec," UnDoc. ST/SG/SER.E/1079, United Nations Secretariat (2022), https://documents-dds-ny.un.org/doc/UNDOC/GEN/222/578/0E/PDF/2225780E.pdf?OpenElement.

869 jThe Permanent Mission of the Russian Federation to the United Nations (Vienna), "Information Furnished in Conformity with the Convention on Registration of Objects Launched into Outer Space. Note Verbale Dated 8 November 2022 from the Permanent Mission of the Russian Federation to the United Nations (Vienna) Addressed to the Secretary," UnDoc. ST/SG/SER.E/1081 (2022), https://documents-dds-ny.un.org/doc/UNDOC/GEN/V22/182/45/PDF/V2218245.pdf?OpenElement.

data on general function of an object, however, it is still too general in nature to allow one make conclusion about the status of an object. It should be borne in mind that it is the duty of a targeting state to do everything feasible to verify that a satellite planned to attack is not a civilian object. States have no obligation neither under IHL or ISL to identify their objects as military objectives.

Parties to the conflict are required to take active precautions before waging attacks on satellites. Precautions require identification of a target and evaluation of the surrounding environment so as civilian objects were neither targeted, nor recklessly placed under a higher risk of collateral damage. No attacks shall be implemented in large distance without knowing the exact nature and purpose of a satellite. Although it is knowledgeable that in practice verification of a target hundreds or even thousands of kilometres away may seem to be too complicated, parties to the conflict are legally bound to do everything feasible to verify a target. In other words, IHL does not require one hundred percent accuracy in the choice of a target, but it does require the prudent use of all available means. Open-source data shows that military intelligence activities (such as rendezvous operations) in outer space or on outer space technologies are active and it would be seemingly unreasoned to claim that major space superpowers do not possess information relative to space militarization, capabilities of the potential opponent, or at least major military space technologies posing higher threat. Satellite target verification is not an unimplementable task.

Doing everything feasible in target verification process requires acting in good faith. Satellite status should not be simply estimated but verified by the actual information gathered by reconnaissance or open sources, explained by experts, such as satellite engineers. A party to the conflict should take all feasible precautions in choice of means and methods of satellite attack to avoid or minimize collateral damage. It is also suggestible for the attacking state to consider circumstances under which least collateral damage might be caused. For instance, the time of attack (e.g. at night) or a place of a satellite in orbit (e.g. over high seas) may be relevant to have less collateral effects. Satellite movement is calculable and predictable, they can hardly escape attacks. Therefore, duty of the attacking state to give effective advance warning when circumstances permit is implementable without any major jeopardize of success of the military operation.

It is prohibited to implement indiscriminate attacks against satellites. Using an overly powerful weapon in a crowded orbit without actually having intention to hit a specific military objective, would most likely affect other satellites and if such an attack was planned to do so, it may qualify as indiscriminate. Kinetic ASAT attacks implemented without due care to the surrounding orbital environment and the altitude of a target are at high risk to breach prohibition of indiscriminate attacks.

3.8. Principle of proportionality and satellite targeting

3.8.1. General remarks

Up until this part of thesis, we have disclosed one of the essential elements of IHL describing the nature of modern laws of war – the strict division between military and civilian environment. Even though the rules deriving from such division are genuinely followed, the effects of hostilities nevertheless spread in the civilian world. It is yet another limitation of conduct in hostilities which aims to reduce these effects – the requirement to measure the outcome of military operations on civilians, civilian population or civilian objects. We must say, IHL does not seek to prohibit the negative outcome of war on civilian environment, but rather limit it as far as possible without impeding legitimate military goals. In Author's view, principle of proportionality is the second most important pillar of IHL without which the first pillar – principle of distinction – would be inoperative and if applied alone, would disbalance IHL itself. If collateral damage was unlimited, any weapons capable of striking difference between military and civilian objects would probably be legitimate. In that case, the use of nuclear weapon on a military objective located in an urban area could hardly be questioned. While the question to be asked by a prudent commander applying principle of distinction is "whom shall I attack?", application of principle of proportionality requires asking "how shall I attack?". Of course, there are many other questions that a commander or a military lawyer-adviser shall ask before launching an attack, however, in this context and generally speaking, we would not be mistaken to describe principle of distinction as a quantitative and principle of proportionality as qualitative in nature – the former requires identification while the latter requires measurement.

The fundamental maxim of IHL which has been repeatedly emphasized in this thesis stating that parties to the conflict are not free to choose any means and methods of warfare, yet once again assists in placing different IHL requirements in one consistent order. For instance, targeting decision makers are not only required to identify a potential target as a military objective by using all available means, but also to estimate how the attack on the target would affect the surroundings – civilians and infrastructure on which wellbeing of civilians depends. In other words, they have to measure the military gain and the civilian loss. If the civilian loss is greater than the military gain – the attack should not be launched or at least be suspended, otherwise, the breach of proportionality would occur. Principle of proportionality helps to balance the two "antagonists" of IHL – military necessity and humanity.

Principle of proportionality is hard to apply in practice because it is qualitative in nature – there are no legal formulas that help to precisely determine how many civilian lives are worth a life of a high level commander, how many civilian houses are worth one military base, how many civilian aircrafts are worth one fighter jet, or, as Solis

asks, "[h]ow can human lives be compared to "things"?"[870] Although this principle has attained a lot of attention by academics, jurisprudence has been very limited and even confusing (discussed further). For this reason, proportionality may often be perceived as rather a theoretical requirement. Even though the assessment of proportionality is highly subjective, it does not mean that the principle itself is uncharacterized or worth less attention.

This chapter seeks to disclose the origins, the content, the theory and practice surrounding principle of proportionality.

3.8.2. Origins of proportionality

Up until the nineteenth century there was no black letter international law governing conduct in hostilities (*jus in bello*) and, strictly from legal point of view, we may find it challenging to articulate ideas about proportionality of earlier thinkers. Limitations on the conduct of hostilities originally spread among protagonists of just war theory. However, viewing proportionality merely from the *jus ad bellum* and *jus in bello* separation point of view, we would limit ourselves with contemporary and positivist-like notion of proportionality as understood currently, with no development, with no medieval origin. At this point, Author believes shifting to *jus ad bellum* side merely for the disclosure of proportionality roots would not contradict the limits of this thesis set in the introduction.

Principle of proportionality has its roots in ancient times, major religious and philosophical thoughts. The book of Genesis tells a story about Lord's decision to destroy the two biblical cities of Sodom and Gomorrah. The wickedness and "grave sin" of inhabitants of Sodom and Gomorrah provoked Lord's anger. Abraham questioned Lord's decision of destroying the whole two cities asking the Lord: "Will you indeed sweep away the righteous with the wicked? Suppose there are fifty righteous within the city; will you then sweep away the place and not forgive it for the fifty righteous who are in it?" The Lord answered: "If I find at Sodom fifty righteous in the city, I will forgive the whole place for their sake." Abraham continued: "Suppose five of the fifty righteous are lacking? Will you destroy the whole city for lack of five?" The Lord said "I will not destroy it if I find forty-five there." Abraham downgraded the number to ten and provoked Lord's answer that even if only ten out of all inhabitants in Sodom are sinless, the Lord would not destroy the whole city.[871] The Bible indeed distinct the sinful with righteous and urges to morally spare the latter despite their small proportion compared to the former.

In Judaism, Philo of Alexandria wrote on the special laws of war which "distinguishes between those whose life is one of hostility and the reverse. For to breathe slaughter against all, even those who have done very little or nothing amiss, shows

870 Solis, *The Law of Armed Conflict. International Humanitarian Law in War*. 273.

871 "The Book of Genesis. Chapter 18," accessed April 22, 2022, https://www.vatican.va/archive/bible/genesis/documents/bible_genesis_en.html#Chapter 18.

what I should call a savage and brutal soul, and the same may be said of counting women, whose life is naturally peaceful and domestic, to be accessories to men who have brought about the war."[872]

The early Muslim thinkers were keen on preserving the lives of innocent: "Umar wrote to the commander to fight in the way of Allah and to fight only those who fight against them, and not to kill women or minors, or to kill those who do not use a razor."[873]

In just war theory, proportionality limited the amount of damage that could be legitimately inflicted upon the adversary.[874] Brown summarised proportionality in just war theory as follows: "[p]roportionality involves considering all the evil resulting from a war, and weighing it against the good that will occur or the harm that will be avoided."[875] Despite such claim, older thinkers of just war theory did not elaborate much on the proportionality, but rather on the existence of a just cause of war. For instance, St. Augustine of Hippo was of opinion that if just cause existed in war, all other means to achieve victory were automatically justified.[876] This view was criticized by Thomas Aquinas who emphasized the importance of the amount of force used and, although indirectly, the need for proportionality assessment: "[i]f a man in self-defence uses more than necessary violence, it will be unlawful, whereas if the repels force with moderation, his defence will be lawfull."[877] In 1539, Spanish theologian and lawyer Francisco de Vitoria lectured: "[C]are must be taken to ensure that the evil effects of the war do not outweigh the possible benefits sought by waging it. If the storming of a fortress or town garrisoned by the enemy but full of innocent inhabitants is not of great importance for eventual victory in the war, it does not seem to me permissible to kill a large number of innocent people by indiscriminate bombardment in order to defeat a small number of enemy combatants. Finally, it is never lawful to kill innocent people, even accidentally and unintentionally, except when it advances a just war which cannot be won in any other way. In the words of the parable: 'Let the tares grow until the harvest, lest while ye gather up the tares, ye root up also the wheat with them.'"[878] As seen, principle of proportionality is evidently seen from Vitoria's text

872 Gregory M. Reichberg, Henrik Syse, and Nicole M. Hartwell, *Religion, War, and Ethics – A Sourcebook of Textual Traditions*, ed. Gregory M. Reichberg and Henrik Syse (Cambridge: Cambridge University Press, 2014). 22-23.

873 In Amichai Cohen and David Zlotogorski, *Proportionality in Internaitonal Humanitarian Law: Concequences, Precautions, and Procedures*, ed. Michael N. Schmitt, Lieber Ins (Oxford: Oxford University Press, 2021). 13.

874 Judith Gardam, "Proportionality as a Restraint on the Use of Force," *Australian Year Book of International Law* 20 (1999): 161–74. 163.

875 Gary D. Brown, "Proportionality and Just War," *Journal of Military Ethics* 2, no. 3 (2003): 171–85. 172

876 Cohen and Zlotogorski, *Proportionality in Internaitonal Humanitarian Law: Concequences, Precautions, and Procedures*. 13.

877 In Cohen and Zlotogorski.13.

878 Anthony Pagden and Jeremy Lawrance, eds., *Political Writings / Fransico de Vitoria* (Cambridge: Cambridge University Press, 1991), 315-316.

requiring the balance between the "evil effects of the war" with "possible benefits" of war. In the early seventeenth century, Francisco Suarez stated more clearly: "due proportion must be observed in its beginning, during its prosecution, and after victory."[879]

Although thinkers of just war theory contemplated the question of war's legality, the division between *jus in bello* and *jus ad bellum* was not so evident as currently. Multiple sources indicate that proportionality evolved from just war theory as a mixed notion involving the amount force and the suggestion to consider the effect of such force on those who do not participate in war. The mixed understanding of proportionality remained until *jus ad bellum* started legally crystalizing in the form of 1919 Covenant of the League of Nations, 1928 Kellog-Briand Pact and finally in the 1945 Charter of the United Nations while *jus in bello* being regulated by Hague and Geneva laws.

Until the adoption of IAP, proportionality as a term did not appear in legal texts of the law of armed conflict. Having in mind the fact that by the time of writing this thesis IAP is still the most modern universal codification of targeting rules, we may not argue that principle of proportionality evolved in *lex scripta* in one or another way before 1977. Despite such absence, rudiments of it may be found in the Lieber Code.

The 1863 Lieber Code stipulated that "civilization has advanced <…>, so has advanced <…> the distinction between the private individual belonging to a hostile country and the hostile country itself, with its men in arms. The principle has been more and more acknowledged that the unarmed citizen so to be spared in person, property, and honor as much as the exigencies of war will admit."[880] This article of Lieber Code neither codifies nor articulates principle of proportionality. It rather reminds that destruction in war, especially of persons or objects taking no active military action or having no military value, should not be totally unlimited.

Neither the subsequent treaties of the "Hague law", nor "Geneva law" ever mentioned principle of proportionality. In the past, once an attack was waged against a military objective, any collateral damage on civilians or civilian objects was acceptable.[881] In 1977, with the adoption of IAP, principle of proportionality was first codified, however, despite being "inherent"[882] in the structure of IHL, it was not chosen to have a specifically dedicated article, as for example principle of distinction.

During the drafting process of IAP and IIAP, article 51(5)(b), codifying principle of proportionality was subject to multiple discussions and criticism starting from the suggestion to have no formulation but rather a link to Article 57 regulating precautions in attacks or criticizing imprecise wording and terminology.[883] Some delegations

879 Michael Newton and Larry May, *Proportionality in International Law* (New York: Oxford University Press, 2014). 62.

880 Lieber, Instructions for the Government of Armies of the United States in the Field. Art. 22.

881 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 129.

882 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 350.

883 See Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 625.

in the CDDH even opposed the inclusion of proportionality arguing that there could be no justification for civilian losses resulting from attacks on military objectives or, a more thoughtful concern, that principle of proportionality is too subjective and requires a comparison of values which cannot be compared.[884]

3.8.3. Principle of proportionality in the IAP

In the past, an attack against military objective causing disproportionate damage had been legally considered as acceptable, because principle of proportionality has neither been codified, nor customary. However, nowadays, the customary status of this principle is unquestionable.[885] The ICRC Customary IHL study describes principle of proportionality as follows:

"Rule 14. Launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited."[886]

Principle of proportionality is reflected in other rules of the ICRC Customary IHL study. For instance, rule 18 regulating military precautions requires each party to the conflict to "do everything feasible to assess whether the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."[887] Rule 19 is also part of precautions in attacks: "[e]ach party to the conflict must do everything feasible to cancel or suspend an attack if it becomes apparent that the target is not a military objective or that the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."[888]

Principle of proportionality is codified in two Articles of IAP – both of which were already discussed. Firstly, Article 51(5)(b) provides that the breach of proportionality in attacks is considered as an indiscriminate attack and, secondly, this principle is found in Article 57 regulating precautions in attacks. Both articles provide identical definition of disproportionate attacks – these are the attacks which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated. Even though, principle of proportionality is not mentioned in any Article of IAP, it is reflected all around IAP. Judge Higgins in the

884 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 351.

885 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 129.

886 Henckaerts and Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules*. 46.

887 Henckaerts and Doswald-Beck. 58.

888 Henckaerts and Doswald-Beck. 60.

Dissenting Opinion in the ICJ Nuclear Weapons Opinion stated: "The principle of proportionality, even if finding no specific mention, is reflected in many provisions of Additional Protocol 1 to the Geneva conventions of 1949. Thus, even a legitimate target may not be attacked if the collateral civilian casualties would be disproportionate to the specific military gain from the attack."[889]

Obviously, determination of principle of proportionality requires a balancing of:

1. the foreseeable extent of incidental or collateral civilian casualties or damage, and
2. the relative importance of the military objective as a target.[890]

Both of these requirements involve a balancing of different values, sometimes incomparable, and the result would always be more or less subjective.[891] However, principle of proportionality has certain characteristics which, at least partly, help to achieve consistent application of it.

Firstly, principle of proportionality is pre-emptive in nature. Article 57 ruling on precautions in attacks requires making certain calculations prior the attack. It stipulates that the attacks directed at a military objective are prohibited if they may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated. The words "expected" and "anticipated" are future orientated and indicate that the balancing of military advantage and collateral damage ought to be made prior the attack. This means that even though in the aftermath of the attack the actual collateral damage is clearly disproportionate to the military advantage, it would not necessarily mean that it is disproportionate legally. The circumstances in military operations may change quickly leaving no chances for the relevant information to chase a targeting decision maker and, for instance, civilians may surprisingly appear in the area of a target or the target itself may appear in an unpredicted environment, as an example, having hidden explosives causing stronger explosion than expected. If the commander had no means to predict the collateral damage, but he/she was genuine in taking active precaution steps in implementing the attack, the attack may not be easily qualified as disproportionate despite that evident disproportion in its results. In *Blaskič* case ICTY held that the vigorous use of heavy weapons to seize villages inhabited mainly by civilians had consequences out of all proportion to military necessity.[892] When military targets are relatively small, hardly visible or otherwise hardly targetable by certain means, it is necessary to put efforts into the right choice of weapons and intelligence data, otherwise the breach of proportionality might be at higher risk.

Secondly, as seen from articles 51(5)(b), 57(2)(a)(iii) and 57(2)(b) of IAP,

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889 I.C.J. Reorts, Dissending Opinion of Judge Higgins in the International Court's of Justice Advisory Opinion on Legality of the Threat or Use of Nuclear Weapons (1996).

890 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 351.

891 Bothe, Partsch, and Solf. 351.

892 Judgement, *Blaskić,* (IT-95-14-T), Trial Chamber, 3 March 2000, para, 651.

proportionality is assessed only in context of attacks, not all military operations (the difference between attacks and military operations is discussed in "3.2. The notion of "military operations"" and "3.3.ASAT technologies and the concept of attacks under IHL").

Thirdly, proportionality comes into play only when damage is incidental. That means that proportionality is not assessed when civilians or civilian objects are directly targeted, other rules discussed previously prohibit such attacks. Proportionality is assessed only when the target is military objective or at least by the time of the attack has been qualified as so.

Fourthly, principle of proportionality requires acting in good faith and competently.[893] Decision should be made on the basis of information of facts and circumstances available to the decision-making commander at the time and not the basis of hindsight.[894] This requirement does not mean that a commander should use all possible means to attain information. It rather suggests that a commander need to take feasible measures to acquaint himself/herself with the needed information.

Fifthly, terms "may be expected" and "excessive" hint that the breach of proportionality is not a highly coincidental sequence of circumstances, but rather an intentional failure to obey IHL. The disproportion of the potential collateral damage should be rather evident and manifest than conditional, doubtful and disputable. For example, the adverb "clearly" is added in the Rome Statute listing disproportionate attacks among other types of war crimes.[895] Dinstein criticizes authors of ICRC IAP Commentary for confusing terms "excessive" with "extensive". He notes that even extensive civilian casualties need not be "excessive" in light of the concrete and direct military advantage anticipated. Dinstein gives an example of bombardment of a military objective where thousands of civilians work where the attack should not be discontinued merely for the number of civilians working in the military objective – civilians working in military bases or in munitions factories should be excluded altogether from the calculation of "excessive" collateral damage.[896] However, it should also be noted that disproportion needs not to be unbearably large.[897]

Sixthly, the term "concrete and direct military advantage", borrowed from the definition of military objective (see "2.2 Targetability of satellites and the notion of military objective") refers to the specific military operation of which the attack is only a part. So, principle of proportionality should be viewed not merely from the angle of any specific act but rather the whole operation (for the interpretation of concrete and

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893 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 683-684.

894 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 352.

895 Article 8²(2)(b)(iv). UN General Assembly, "Rome Statute of the International Criminal Court (Last Amended 2010)" (1998).

896 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 131.

897 Dinstein. 131.

direct military advantage see "2.2.2 The subjective element of military objective").[898]

Seventhly, principle of proportionality, as Dinstein notes, "has nothing to do with injury to combatants or damage to military objectives."[899] It requires measuring military advantage on one side and collateral damage on civilians or civilian objects on the other side. No matter how great military casualties are, the attack is measured by its impact strictly on the civilian environment. The rule of proportionality explicitly requires harm to be "incidental" – it must occur in the course of an attack directed against a military objective.[900]

Eighthly, proportionality test requires the assessment of civilian injuries and deaths, not merely inconveniences. In *Prlić* ICTY trial chamber established the fact that destruction of the Old Bridge of Mostar placed residents in the Muslim enclave of the right bank of the river Neretva in total isolation, making it impossible for them to get food and medical supplies resulting in a serious deterioration of the humanitarian situation for the population living there. These circumstances led ICTY trial chamber to conclude that although the destruction of the bridge may have been justified by military necessity, the damage to the civilian population was indisputable and substantial. Moreover, ICTY determined that the destruction of the Old Bridge had a very significant psychological impact on the Muslim population of Mostar. ICTY concluded that the impact on the Muslim civilian population of Mostar was disproportionate to the concrete and direct military advantage anticipated by the destruction of the Old Bridge.[901] This decision was criticized by some authors as "wrongly drawn".[902] For instance, proportionality requires the assessment of only civilian deaths, injuries and damage to civilian objects. Other intangible effects on the civilian population, such as inconveniences, irritation, stress or fear are not factored into collateral damage.[903] Therefore, without clearly establishing that the cut of supply route caused any civilian injuries or deaths and not only psychological inconveniences ICTY seemingly misapplied principle of proportionality. Although relatively limited, state practice seems to uphold the view that inconvenience for civilians does not constitute collateral damage. Despite most military manuals being silent on that matter, the US Commanders

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898 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 352.

899 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 129.

900 Emanuela-Chiara Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment" (London, 2018), 8, https://www.chathamhouse.org/publication/proportionality-conduct-hostilities-incidental-harm-side-assessment.

901 Judgement, *Prosecutor vs. Prlić et. al.* (IT-04-74-T), Vol III, Trial Chamber, paras. 1582-1584.

902 Ian Henderson and Kate Reece, "Proportionality under International Humanitarian Law: The 'Reasonable Military Commander' Standard and Reverberating Effects," *Vanderbilt Journal of Transnational Law* 51, no. 3 (2021): 835–55. 837-838.

903 Henderson and Reece. 838.

Manual[904] and Danish LOAC Manual[905] clearly stipulate those inconveniences caused by military operations are below the threshold for collateral damage and are one of the circumstances any person must endure during an armed conflict.

Essential issues related to the appropriate implementation of proportionality rise out of subjective evaluation process. Dinstein summarises four core issues seen by other scholars:

1. military advantage and civilian casualties or damage may not be compared with arithmetical precision. Projected civilian losses or civilian damage may be estimated, but how can one estimate an anticipated military advantage on a measurable scale?
2. It is not clear to what extent the reverberating effects of an attack must be included in proportionality analysis and when they become too remote to count?
3. Opposing belligerent parties hardly ever share same rival values and long-term military benefits may be seen differently by both of them – this leads to subjective and different understanding of proportionality by on or other belligerent party.
4. Proportionality is based on probabilities, because the evaluation process is a matter of pre-attack expectation and anticipation. How should proportionality be evaluated when the probability of achieving certain military advantage and causing certain collateral damage does not equal to 100 percent?[906]

These issues are contemplated further.

3.8.4. Calculating proportionality

Article 51(5)(b), which indirectly requires the measuring of proportionality, describes the projected attack as one "which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects" and it would be excessive "in relation to the concrete and direct military advantage anticipated." Put it differently, parties to the conflict are required to estimate losses of civilian and military environment whereas the former serves as the limitation of attacks and the other – as catalysator. For the attacks to be justified, the scale should always dip to the catalysator side. Therefore, the arithmetic of proportionality involves the measurement of two opposite elements: the measurement of projected "concrete and direct" military advantage and the measurement of projected civilian losses.

3.8.4.1. Assessment of military advantage

The major factor in determining the military advantage of a particular attack in the equation of proportionality is the importance of the target for achieving a particular

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904 Department of the Army and United States Marine Corps, The Commander's Handbook on the Law of Land Warfare. 2-12.

905 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations. 309.

906 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 132-133.

military goal. The more integral the potential target is to the military strategy, the higher the level of likely civilian casualties and damage to civilian objects that will be acceptable.[907]

The Protocol imposes limits on what counts for military advantage – it uses the phrase "concrete and direct military advantage." Authors of ICRC IAP Commentary explain that "[t]he expression "concrete and direct" was intended to show that the advantage concerned should be substantial and relatively close, and that advantages which are hardly perceptible and those which would only appear in the long term should be disregarded."[908] In other words, authors of ICRC IAP Commentary hold that "concrete" advantage is synonymous to "substantial" advantage, which, in Author's view, are not identical notions, because the former reflects tangibility and the latter – the quantity of the military gain. However, more importantly, ICRC IAP Commentary placed time category in the proportionality equation emphasizing that military advantage should rather be instant than appear in an indefinite period of time. Contrary to ICRC IAP Commentary, authors of Bothe's IAP Commentary explain that "concrete" means specific as opposed to "general". Therefore, the meaning of "concrete" is roughly equivalent to the adjective "definite" used in the definition of military objective of IAP Article 52(2). "Direct", on the other hand, means "without intervening condition or agency."[909] Similarly to the ICRC IAP Commentary, authors of Bothe's IAP Commentary indicate that a "remote advantage to be gained at some unknown time in the future would not be a proper consideration to weigh against civilian losses."[910]

The assessment of potential military advantage and collateral damage begs the question whether a commander should calculate each military activity of his subordinates, several military activities, the whole military operation or several military operations. For instance, we may question whether the elimination of a military satellite with disproportionate increase of the number of space debris as collateral damage may still be proportionate from the perspective of the whole military operation where satellite attack form only part in it? Evidently, during active combat situations commanders simply cannot supervise each gunshot or strike of their subordinates. It would seem that "concrete and direct military advantage" needs not to be measured in each military engagement but rather each attack in general. Authors of Bothe's IAP Commentary stipulate, "[i]t would obviously be impossible to apply this balancing requirement to each individual act of violence which takes place during the course of a battle. The concept of military advantage involves a variety of considerations including

907 Judith Gardam, *Necessity, Proportionality and the Use of Force by States There* (Cambridge: Cambridge University Press, 2004). 102.

908 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 684.

909 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 407.

910 Bothe, Partsch, and Solf. 407.

the security of the attacking force."[911] On the other hand, it seems impossible to offer a universal explanation which activities of combat are subjected to proportionality assessment, and which are not. This is because one missile launch may in some cases be an ultimate goal of the whole military operation (e.g. to destroy a specific satellite control centre), one of the goals of a wider military operation (e.g. to destroy all satellite ground stations in the opponent's territory) or a really small part of one prolonged military operation (e.g. aerial bombing campaign to prevent the opponent from using any satellite signals, including communication and positioning, for a certain period of time). In this context, we may quote UK's position on proportionality which it made upon ratification of IAP: "[i]n the view of the United Kingdom, the military advantage anticipated from an attack is intended to refer to the advantage anticipated from the attack considered as a whole and not only from isolated or particular parts of the attack."[912] Similar statements about consideration of "an attack as a whole" have been made by Australia, Belgium, Canada, France, Germany, Italy, the Netherlands, New Zealand and Spain.[913] In such an understanding, it is not sufficiently clear how should a state evaluate proportionality in, for example, aerial bombardment missions. Should proportionality be measured in case of single launch of missiles from one military aircraft on one target, or the launch of missiles on the same target from multiple aircrafts, or multiple aircrafts launching on multiple targets but in single take off mission? Should proportionality be assessed in all combat activities? Should the military advantage be somehow accumulated from each military engagement? On the one hand, the targeted party would rather choose calculating the effects of each military engagement to uncover as more possible breaches as possible. On the opposite site, the targeting party would rather choose assessing collateral damage from cumulative military operations or even all armed conflict where the breach of proportionality would be hard to prove if all collateral damage was the cause of ultimate goal of winning the war. In the former case (if each activity of any combatant and any civilian damage caused by that activity was subjected to proportionality assessment) commanders would be required to do what is impossible – to look after any movement of any supervised combatant, while on the latter case (if all military activities and all collateral damage during the whole armed conflict were subjected to proportionality assessment) targeting rules would simply lose their purpose, because multiple isolated disproportionate attacks

911 Bothe, Partsch, and Solf. 352.

912 "UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND Declaration 2 July 2002 for Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," 2002, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Notification.xsp?action=openDocument&documentId=0A9E03F0F2EE757CC1256402003FB6D2.

913 *See* International Committee of the Red Cross, "Treaties, States Parties and Commentaries. Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977," accessed May 6, 2022, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/States.xsp?xp_viewStates=XPages_NORMStatesParties&xp_treatySelected=470.

would not be evaluated or outweighed by an ultimate military advantage gained by winning the war.

The answer should probably rest somewhere in the middle.

Few years after the adoption of IAP, Fenrick claimed in his article that an attack envisages action against several military objectives, therefore, "it is unlikely that the standard for measuring "concrete and direct military advantage anticipated" is the military benefit derived from an attack on a single military objective."[914] He gives an example of aerial bombardment when the degree of military advantage derived from operations will vary dependently on whether one focuses on the results of a day's operations, a week's campaign's, or a war's operations or whether one considers military advantage to be the advantage derived from bombarding one particular military objective, all objectives of a similar type, or all objectives in general.[915] Examples of Fenrick show that estimation of collateral damage in each attack would depend on the mindset of the attacker. The Author has stated earlier that the effectiveness of IHL implementation and compliance with rules of IHL (and, most probably, any branch of law) depends on the objective perception of these rules. The less interpretative the rule, the less disputes it provokes and the more effective is its application. Gradam notes that cumulative counting of military advantage contradicts IAP purpose. For instance, the defoliation of large tracts of Vietnamese forests in 1960s had a long-term cumulative purpose of destroying the cover it provided for the Vietcong guerrilla forces. Each defoliating mission resulted in little military advantage in itself, however, resulted in multiple casualties of Vietnamese civilians and widespread damage to civilian objects. If the military advantage was calculated generally by a sum of advantages gained in cumulati ve missions, then it would probably not fail the proportionality test.[916] However, Gradam also notes that military advantage needs not to be analysed on a narrow case-by-case basis in relation to each distinct target.[917] Cannizzaro points out that proportionality "is not a rule of conduct but a rule which requires a balancing of antagonistic values, such as the interest of the belligerent in carrying out a military action, on the one hand, and the interest of civilians who, although extraneous to the conduct of the hostilities, might be victimized by that action."[918] He notes that it would be illogical to assume that the level of protection of one side of proportionality equation might depend on the subjective qualities of the other. Contrary, proportionality requires that civilians were protected independently from the intrinsic characteristics of the belligerents. Cannizzaro concludes that subjective standard is inconsistent with the essence of the proportionality principle.[919]

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914 William J. Fenrick, "The Rule of Proportionality and Protocol in Conventional Warfare," *Military Law Review* 98 (1982): 91–128. 106.

915 Fenrick. 107.

916 Gardam, *Necessity, Proportionality and the Use of Force by States There*. 101.

917 Gardam. 102.

918 Enzo Cannizzaro, "Contextualizing Proportionality: Jus Ad Bellum and Jus in Bello in the Lebanese War," *International Review of the Red Cross* 88, no. 864 (2006): 779–92. 787.

919 Cannizzaro. 787.

Other scholars propose different position. According to Dinstein, military advantage cannot be seen through the eyes of an individual soldier, tank crew or aviator. Especially in a prolonged air campaign, it would be mistaken to weigh proportionality on the basis of a single sortie.[920] Authors of Bothe's IAP Commentary interpreted attacks as "the co-ordinated acts of violence against the adversary by a specific military formation engaged in a specific military operation, rather than to each act of violence of the individual combatants who are members of that formation. It does not, however, exclude acts of violence by an individual combatant such as a sniper acting alone, or a single bomber aircraft."[921] Therefore, Dinstein and authors of Bothe's IAP Commentary similarly explain that there is no requirement to assess proportionality in each active combat situation at the level of individual soldier. Indeed, the Author agrees with such position but would also like to stress that in certain cases individual combat activity may in itself constitute end-operation. For instance, a soldier mining an apartment in the block building used by the enemy should still consider the explosive power of an explosive and other circumstances which might negatively affect civilians living nearby.

It is noted in the Rome Statute's Elements of Crimes that the "expression "concrete and direct overall military advantage" refers to a military advantage that is foreseeable by the perpetrator at the relevant time. Such advantage may or may not be temporally or geographically related to the object of the attack. The fact that this crime admits the possibility of lawful incidental injury and collateral damage does not in any way justify any violation of the law applicable in armed conflict."[922]

The time frame of assessment of military advantage is also important. Authors of Bothe's IAP Commentary note that calculation of proportionality requires certain level of causation because "direct" means not "too remote". IAP proportionality rule is designed to ensure that the assessment of the military advantage is in the relatively short term rather than to allow for the inclusion of the long-term cumulative effects.[923]

All being said, we can search for most rational interpretation of the assessment of military advantage. First of all, it is necessary to indicate that military operations may have multiple different stages and different types of activities. Some of them may constitute elements of psychological warfare, others may constitute attacks. Some activities may only be preparatory (the transfer of military equipment), other may look like preparatory, but legally considered as attacks (such as laying landmines) and other activities might evidently constitute attacks (launching an ICBM on a military satellite). Therefore, it would be logical to downsize the assessment of military advantage

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920 Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*. 134.

921 Bothe, Partsch, and Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. 329.

922 International Criminal Court, "Official Records of the Review Conference of the Rome Statute of the International Criminal Court, Kampala," in *Elements of Crimes* (Kampala, 2010), (International Criminal Court publication, RC/11. 13 (Footnote No. 36).

923 Gardam, *Necessity, Proportionality and the Use of Force by States There*. 102.

to the scale of type of activities, not whole military operation and not merely single use of a military equipment. In this way, it may be logical to assess military advantage of a single bombing campaign rather than single launch of explosives from one of many aircrafts. If bombing campaign is part of broader operation having, for example, also ground activities, than the military advantage gained by air activities and ground activities should be estimated separately. In case of satellite attacks, for instance, if one constitutes part of larger operation to disable the opponent from using effective communication tools, all other operations not involving satellite attack should be evaluated in conjunction with satellite attack. If the purpose of ASAT attack is to destroy specific satellite (or satellites), the military advantage should be estimated separately. It is suggestable to assess military advantage on the scale of the type of activity within single launch. If the single launch of military means involves separate targets, the planning of each target attack should involve estimation of proportionality. This is because some targets may be in close proximity with civilian objects and pose greater risk of collateral damage, while others being isolated military objectives – may pose none. If the risk of collateral damage differs, it would be logical to require from the attack planners to take into consideration all circumstances that may jeopardise the safety of civilians or civilian objects.

Once again it should be reminded that IHL impose obligation to follow targeting rules not during military activities in general, but each military activities that constitute attacks. None of attacks, even being small-scale in nature, may avoid the assessment of proportionality. IHL makes no exceptions regarding application of targeting rules to certain scale military activities. On the other hand, it is agreeable that military commanders cannot ensure what measures are taken by their subordinates in each military engagement. IHL may not require them to do so. Since targeting requirements primarily rest on shoulders of those who plan attacks and failure to follow these requirements may invoke individual responsibility, the puzzle of military advantage assessment should be solved primarily in context of individual responsibility. As was mentioned, Rome Statute explains that "concrete and direct" military advantage connotes to foreseeability. A reasonable commander who plans attacks should be able to foresee collateral damage and military advantage. Unless the military advantage is unforeseeable, each attack should be followed by the assessment of proportionality.

Lastly, IHL requires that each military engagement was implemented with considerations of threat to civilians and civilian objects. Even smallest in scale attacks which pose risk to civilian and civilian objects should involve considerations of proportionality. The Author believes that small scale attacks waged by individual soldiers or small groups should follow targeting requirements as long as collateral damage is foreseeable by a reasonable person. Such consequence-based approach is reasonable and legally expected, because IHL requires parties to the conflict make all decisions with due regard to civilians and civilian population. As long as collateral damage is foreseeable for a reasonable person, the assessment of it should not be considered as a disproportionate requirement impeding the achievement of military goals. In this case, for example, satellite shadowing operations having no primary violent effects should still constitute

attacks if the shadowed satellite signal loss could invoke collateral damage foreseen by a reasonable person.

In conclusion, the Author suggests that estimation of military advantage should follow these rules:

1. In case of multiple attacks forming part of military operation the estimation of military advantage may combine single type of attacks if it is impossible to estimate military advantage of one single attack;
2. If single type attacks involve targets with different threat levels on civilians and civilian objects, each attack posing threat to civilians or civilian objects should be estimated separately;
3. Military advantage may be estimated only in cases when it is foreseeable by a reasonable person;
4. All attacks should be planned with concern of damage to civilians and civilian objects.

3.8.4.2. Assessment of collateral damage

Determining what is excessive collateral damage is yet another difficult question. The rule of proportionality precisely defines what kind of military advantage should be assessed – it must be "concrete and direct". However, this rule does not set any factors which would help to characterise collateral damage. It only states that collateral damage may be expected to be caused. Gardam notes that any attempt to list such factors would compromise the ability of the proportionality rule to adapt itself to changing means and methods of warfare.[924] Is it really necessary to provide guidance on collateral damage assessment?

In 2016, when United States decommissioned one of its GPS satellites, an error of 13 microseconds of synchronized time occurred which led to difficulties to receive digital radio signals. That led to thousands of alarms by companies using timing equipment and destabilized for many hours the operation of the information technology systems.[925] The size of an error threatened the stability of the energy and telecom sector exceeding maximum permissible UTC time error.[926] The 13 microseconds gap caused 4 kilometers error in GPS receivers. [927] This incident, also known as SVN-23 error, shows not only the importance of GNSS atomic clocks, but also the risk of unpredictable collateral damage an attack on them might cause. As was already noted, it is difficult to

924 Gardam. 102.

925 T. Widomski et al., "Faults of Synchronization Based on GNSS Receivers and Ethernet NTP/PTP Network: Robust Synchronization & Cyber-Security In Critical Infrastructure(s) – ENERGETICS & SMART GRIDS," ELPROMA, 2018, https://elpromatime.com/wp-content/uploads/2018/10/ELPROMA-Faults-of-synchronisation-based-on-GNSS-NTP-PTP-IEEE1588_.pdf.

926 Widomski et al.

927 Juha Saarinen, "Satellite Failure Caused Global GPS Timing Anomaly," IT NEWS, 2016, https://www.itnews.com.au/news/satellite-failure-caused-global-gps-timing-anomaly-414237.

measure civilian losses and military advantage because these two parts of the equation are dissimilar and any arithmetical link between them would not be logically justifiable. During the drafting process of IAP, Hungary maintained that proportionality (as proposed by ICRC draft) called for a comparison between things that were not comparable, and thus precluded objective judgement.[928] If the position of Hungary was upheld, would there be any other ways to assess collateral damage and ensure the balancing nature of IHL? Key characteristics of collateral damage assessment eliciting from the text of IAP are given further to have a better view of this process.

Firstly, it should be stressed IAP rules out any collateral damage that is not "incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof". Any other collateral damage, such as psychological effects not leading to injuries of civilians or disruption of satellite signals not amounting to damage are not subjected to proportionality analysis. In this context, it is necessary to disclose what is mean by the notion "damage". Dinstein argues that not every inconvenience to civilians as an outcome of the hostilities would enter the calculus of collateral damage. Scarcities of foodstuffs, public transportation running not on time, curfews or appearing blackouts, according to Dinstein, cause merely inconvenience and not damage. If, for instance, GNSS network was attacked and the disrupted calculation of time caused cash withdrawal machines irresponsive, would this situation mount to damage and have consequences floating from proportionality assessment or would it merely be considered as inconvenience? What if electronic financial operations were disrupted and cash operations were the only trade tool available?

Answers to these questions require the reminding that only attacks are subjected to proportionality analysis. Application of targeting rules is irrelevant for any other military operations than attacks. The Author has already suggested a consequence-based approach to determine whether military activities fall under targeting rules (see "3.3. ASAT technologies and the concept of attacks under IHL"). Taken into account IHL's purpose, attacks involve any activities which are expected to cause injuries or deaths to civilians or damage to civilian objects. In other words, rules of targeting primarily seek identification of consequences, not the way in which these consequences occur. It is less relevant whether a satellite is planned to be physically destroyed or merely signals disrupted or blocked, what matters most (from perspective of targeting rules) is whether it is reasonable to believe prior launching an attack that in the aftermath of it civilians will be injured, killed or civilian objects will be damaged or destroyed. If these consequences could have been reasonably foreseen, the act would constitute an attack and targeting rules would apply. It should also be noticed that the foreseeability does not only involve thoughts and knowledge of perpetrator, but rather tools and information available at the time which enables him/her to foresee the outcomes.

Coming back to questions raised in the previous paragraph, the author would like to stress that certain military activities might cause inconvenience for the adversary by, for example, temporarily blinding satellite sensors or requiring restart of certain

928 Fenrick, "The Rule of Proportionality and Protocol in Conventional Warfare." 104.

software, however, if such inconvenience may reasonable foreseen to lead to injury or death to civilians or damage to civilian objects, these military activities should qualify as attacks. On the other hand, if military activities are not reasonably foreseen to cause injuries or deaths of civilians or damage to civilian objects – but merely inconvenience – they fall short of attacks and are probably subjected to other than targeting rules. The foreseeability of satellite targeting planners does not come out of their thoughts and knowledge but also from information available at the time, usability of tools to acquaint that information, the use of expert advice and other available means.

An important characteristic of assessing collateral damage is that it must be a result of an attack on military objective and that this result needs to be expected. Put it other way, collateral damage would not occur if not for the attack. Consequently, we may draw at least two characteristics of collateral damage – causation and foreseeability.

3.8.4.3. Assessing causation

In assessment of collateral damage causal link between the attack and collateral damage needs to be established. It should be reminded that, according to the text of IAP, the anticipated military advantage in the proportionality assessment needs to be direct (as text of IAP reads "concrete and direct" military advantage), however, there is no such requirement for the assessment of collateral damage. While no other rule precludes indirect harm from proportionality assessment, it may be argued that indirect collateral damage needs to be taken into consideration of proportionality as well (see "3.8.5. Reverberating effects of attacks").

Generally, causation may be established by questioning the involvement of the attacking party – no collateral damage would have occurred if not for activities of the attacking party. In other words, causation requires evaluation of activity of the attacking party, not targeted one. To illustrate this, two examples in context of satellite targeting may be given. In first case, a satellite is destroyed by an opponent. The loss of the satellite signal caused misguidance of autonomous vehicle resulting in injuries and deaths of civilians. Evidently, the harm is the result of the attack and the causal link (although indirect) between the attack and the harm may be established. In the second case, an ASAT missile guided by GNSS satellite signal was launched to target one of GNSS satellites. The launched missile followed GNSS satellite signals which it had been targeting. The operating state decided to temporarily shut down the whole GNSS network[929] so as the missile was not able to detect the target. Eventually, the missile missed the target, however, the loss of GNSS satellite signal caused injuries and deaths of civilians. Evidently, causal link may not be established between the satellite attack and the harm, because the harm was not caused by the attack but rather by measures to prevent the potential harm from the attack.

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929 USA developed capabilities to shut down GPS network so as the opponent was not able to use its signals. Space and Missile Systems Center Public Affairs, "Counter Communications System Block 10.2 Achieves IOC, Ready for the Warfighter," 2020.

3.8.4.4. Causation and third-party involvement

The assessment of collateral damage is relatively clear-cut with direct effects of the attack – the effects that are expected to be caused by the use of force need to be assessed. However, in some cases, we may question whether the assessment of collateral damage should involve activities of a third state which is capable of mitigating the collateral damage.

Causation means that incidental damage needs to result from attack. According to Gillard, harm that results from the conduct of an actor other than the one carrying out the attack, and does not arise from the physical effects of the attack, is excluded.[930] Gillard suggests that even when a third party intervenes, there is a causal connection if the physical actions of the attacking party cause the harm. She gives an example of an attack against a water purification facility in a country that is under sanctions and that, consequently, cannot acquire the necessary spare parts to repair the damage. The incidental damage expected to occur is caused by the attack even though it is amplified by the effect of sanctions. She explains that "[w]hile the imposition of sanctions is the conduct of a different actor, the harm – i.e. the civilian deaths and disease – is caused by the physical effects of the attack and must therefore be considered."[931] In context of outer space, similar example may be given. Satellite transponder was shadowed by an enemy satellite. The loss of signal caused deviations of electrical current which damaged multiple electrical appliances, including life-sustaining appliances in the local hospital. A third state has a satellite with a robotic arm capable of towing or repairing other satellites. But a third state decides not to be involved and leaves situation as it is. Even though third state's omission has certain causal link with continuing presence or rising amount of damage, it should still be considered that damage was caused and continues to be caused by the state which shadowed a satellite and not the omission of the state having tools to fix the situation.

Greenwood is of different opinion. The question he discusses is related to the unexploded remnants of war which were intended to explode, such as cluster munitions. According to him, the risk of munitions failing to explode as intended cannot be regarded as rendering the use of those munitions indiscriminate. Only immediate effects of the use of those munitions should be of concern in proportionality assessment. He notes that the "degree of that risk turns on too many factors which are incapable of assessment at the time of the attack, such as when and whether civilians will be permitted to return to an area, what steps the party controlling that area will have taken to clear unexploded ordnance, what priority that party gives to the protection of civilians and so forth. The proportionality test has to be applied on the basis of information reasonably available at the time of the attack. The risks posed by ERW [explosive

930 Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment." 15.

931 Gillard. 15.

remnants of war] once the immediate aftermath of an attack has passed are too remote to be capable of assessment at that time."[932]

Henderson gives an example of attack on a power electrical generating station which produces half of the country's electrical power. The estimation of the outcome of such an attack is thousands of civilian deaths in one year due to inadequate hospital services and disease caused by an unsanitary environment. According to Henderson proportionality should not be counted for these long-term effects of attack because "deaths are not caused by the attack as such and cannot reasonably be termed as being expected as a result of the attack".[933]

Even though the question of third-party involvement, causality and collateral damage is relatively narrow, *opinio juris* of states is not silent on that matter.

Danish LOAC Manual sets a standard of "ability to adjust" or "remedy the situation" into consideration of collateral damage. It reads: "it must be expected to some extent that the adversary's civilian or military authorities, civil society or the civilians themselves, civil defence organisations, humanitarian organisations, etc., have an opportunity to adjust to the altered conditions caused by the attack and to remedy the situation. If this does not happen and the damage occurs, it may very well be ascribed to this neglect, depending on the circumstances. In that case, the damage will not be regarded as collateral."[934] In other words, according to Danish LOAC Manual, the aftereffects of the attack, including those caused by the collateral damage, are not regarded as collateral and should not be taken into consideration in the proportionality assessment if these effects may be mitigated by a third party. And even if they are not, the neglect to do so by the competent services raise question of responsibility upon those neglecting and not those attacking.

Obviously, there is no unanimous position on long-term effects of attack and whether the omission of the third state to help mitigate these effects adds to proportionality assessment. In Author's view, third party activities should neither be taken into account when assessing proportionality, nor mitigate the breach of proportionality. The requirement to abstain from attack which would be expected to cause disproportionate collateral damage compared to the potential military advantage is applied in its full scope (with all of its content) to the party of IAP. The prudent application of this rule requires the will of the party upon which this rule is applicable. In other words, scope of this rule is constant and may not change due to the involvement of third party. Accordingly, one of the elements of proportionality rule – the assessment of expected

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932 Christopher Greenwood, "Legal Issues Regarding Explosive Remnants of War," in *Group of Governmental Experts of the States Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects* (Geneva, 2002), 21–24, https://digitallibrary.un.org/record/472813/files/CCW_GGE_I_WP.10-EN.pdf.

933 Henderson, *The Contemporary Law of Targeting*. 210.

934 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations.

collateral damage – may neither change nor be dependent from a party which is not bound by the rule at the time of its application (only the attacking state is bound to assess proportionality). If the will of a third state (not required to apply proportionality rule at the given moment) would be taken into proportionality assessment of the attacking party, then application of proportionality rule by the attacking party would be dependent not only from its own will but also from the will of party which is not bound to apply the rule in given circumstances. This would change the circumstances in which proportionality rule is applied and, accordingly, would change the scope of this rule. Placing the will of the third party into proportionality assessment would risk for this customary rule to be avoidable and circumventable. Moreover, since customary obligation to assess proportionality rests on the party to the conflict, the content of this obligation may not be altered by activities of third party which the obliging state has no power to change. In other words, third party activities may not alter international binding commitments of a state. Should an attacking party be willing to apply disproportionate military measures, following this logic, it could always justify its actions by lack of involvement (lack of will) of the third party as was expected. On the other hand, similar logic applied, the attacked state willing to hold the attacking state responsible for its actions might not take active steps to mitigate the consequences of the attack. The misinterpretation of law could lead to absurd situations when one binding rule would be differently applicable in different circumstances. Secondly, even though mitigation of collateral damage may be expected by a third party, that does not mean that the attacking party should always count on competence of workers, human resources, or other available means of the third state which are necessary to mitigate the damage. In April 26, 2022 Russian Armed Forces had been claimed to have launched an air strike on Zaporizhzhia nuclear plant in Ukraine which caused fire.[935] Thankfully, the strike did not cause nuclear catastrophe, however in this context, we may question whether the attacking party should rely on Ukrainian fire distinguishing services when assessing proportionality of such an attack. The risk of causing disproportionate damage to civilians, civilian objects, and natural environment by such an attack was evidently greater than the anticipated military advantage, especially bearing in mind the fact that the Ukrainian military forces were not the sole users of electrical power generated by that plant (the protection of works and installations containing dangerous forces and conditions of loss of such protection are detailed in Article 56 of IAP). In this way, Danish perception of proportionality may be questioned.

The Author also disagrees with Henderson's suggestion not to count long-term effects when assessing collateral damage. First of all, IHL does not require counting of deaths of individual civilians, but rather estimation of probability of those deaths. The number of landmines placed, the area where it is placed (such as workable land plot, urban area, etc.) may already indicate the potential and probability of civilian casualties. Secondly, even though effects of attacks may appear only years or decades after

935 Esme Stallard and Victoria Gill, "Nuclear Plant: How Close Was Nuclear Plant Attack to Catastrophe?," BBC, 2022, https://www.bbc.com/news/world-60609633.

the attack, unless they are unforeseeable by a reasonable person, they should be included in proportionality assessment. IHL does not provide any exceptions from proportionality assessment as long as the planned activity constitutes an attack. Thirdly, long-term effects is a subjective notion and may constitute various periods of time dependently from subjective beliefs of a person. If Henderson's suggestion would be followed, many attacks could attain un undesirable subjective element in evaluation of their legality process. Fourthly, IHL already requires the attackers to take into account long-term effects of their activities in case of potential damage to natural environment. It would not make sense to have dual standards when estimating collateral damage.

The Author is of the view that the attacking party should take into consideration all expectable collateral damage without any expectancy of its mitigation from a third party and without any considerations of durability of these effects.

3.8.4.5. Foreseeability assessment

Foreseeability of incidental harm is not directly established in IAP, however, this element flows from the phrase "expected to cause" used in articles codifying proportionality. It is questionable whether "expected" equals to "foreseeable" (see "3.8.5. Reverberating effects of attacks"), however, the responsibility for effects of attacks cannot be limitless. That would contradict the axiomatic legal maxim that the law may not require to do what is impossible.[936] The term "foreseeable" is used in multiple military manuals such as Danish,[937] Norwegian,[938] United States[939] and United Kingdom.[940]

Danish LOAC Manual stipulates that collateral damage is regarded as foreseeable when:

1. its potential is known to the attacker; and
2. it is a consequence of the attack.

The first condition framed in the Danish LOAC Manual is related to the attacker's ability to assess the effect on the target and the consequences of the attack based on knowledge of the target (its nature, the area of the target, etc.). Danish LOAC Manual sets a *mens rea* standard as follows: "[o]nly collateral damage which the person planning or deciding on an attack knew or should have known would occur can be expected to be known to the attacker."[941] The standard of "knew" or "should have known" is commonly linked with a "reasonable commander standard" which is episodically met

936 Lat. *Ultra posse nemo obligatur.*

937 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations. 319.

938 Norwegian Ministry of Defence, "Manual of the Law of Armed Conflict" (2018), 16, https://usnwc.libguides.com/ld.php?content_id=47416967.

939 US Department of Navy, The Commander's Handbook on the Law of Naval Operations. 9-1;

940 Ministry of Defence, JSP 383: The Joint Service Manual of the Law of Armed Conflict. 86.

941 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations. 311.

throughout IHL rules on individual responsibility. When judges solve the question of culpability of commanders, they usually question whether a reasonable person in the place of the commander should have foreseen the negative outcome of the attack (or a breach of law in general). Culpable state of mind of superior is established either through actual knowledge (that a commander actually knew the relevant facts about his/her subordinates) or through required (preferred) knowledge (a commander actually did not know the facts, but his position required so). The required knowledge has been described by ICTY as when a commander "had in his possession information of a nature, which at the least, would put him on notice of the risk of such offences by indicating the need for additional investigation in order to ascertain whether such crimes were committed or were about to be committed by his subordinates."[942] The required knowledge has different wordings throughout international instruments. For instance, the IAP uses the term "had information which should have enabled them to conclude in the circumstances at the time",[943] ICTY[944] and ICTR[945] use "had reason to know" while Rome Statute uses the term "should have known".[946] Despite different wordings and meanings of *mens rea* standards in superior responsibility, for the purposes of this thesis, we may generally claim that international law requires targeting decision makers to act reasonably and prudently before making targeting decisions. The "should have known", "had reason to know" or any other standard require "reasonable foreseeability" of events, reasonable knowledge of circumstances and reasonable willingness to receive more information which would help to act in accordance with international law.[947] Reasonable foreseeability "injects an objective dimension" and refers to the standard in the international criminal law of what a reasonable person should have foreseen in the place of the wrongdoer.[948] In *Galić* case, ICTY stressed that "[i]n determining whether an attack was 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."[949] What may or may not be reasonably foreseen depends on the circumstances in which the attack is planned, decided or launched.

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942 Judgement, *Delalić et. al.,* (IT-96-21-T), Trial Chamber, 16 November 1998, para. 383.

943 1977 IAP, art. 86(2).

944 United Nations Security Council, "Statute of the International Criminal Tribunal for the Former Yugoslavia" (1993). Art. 7(3).

945 United Nations Security Council, "Statute of the International Criminal Tribunal for Rwanda (ICTR)" (1994). Art. 6(3).

946 UN General Assembly, Rome Statute of the International Criminal Court (last amended 2010). Art. 28(a)(i).

947 Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment." 16.

948 Gillard.

949 Footnotes omitted. Judgement, *Galić,* (IT-98-29-T), Trial Chamber, 5 December 2001, para. 58.

ICRC IAP Commentary indicates factors relative to assessment of collateral damage. It stipulates that the "danger incurred by the civilian population and civilian objects depends on various factors: their location (possibly within or in the vicinity of a military objective), the terrain (landslides, floods etc.), accuracy of the weapons used (greater or lesser dispersion, depending on the trajectory, the range, the ammunition used etc.), weather conditions (visibility, wind etc.), the specific nature of the military objectives concerned (ammunition depots, fuel reservoirs, main roads of military importance at or in the vicinity of inhabited areas etc.), technical skill of the combatants (random dropping of bombs when unable to hit the intended target). All these factors together must be taken into consideration whenever an attack could hit incidentally civilian persons and objects. Some cases will be clear-cut and the decision easy to take. For example, the presence of a soldier on leave obviously cannot justify the destruction of a village. Conversely, if the destruction of a bridge is of paramount importance for the occupation or non-occupation of a strategic zone, it is understood that some houses may be hit, but not that a whole urban area be levelled. Other more complex situations may pose difficult problems for those responsible. The golden rule to be followed in such cases is that contained in the first paragraph, i.e., the duty to spare civilians and civilian objects in the conduct of military operations."[950] Similarly, Gillard lists the factors which need to be taken into account – belligerent's capabilities and available resources; whether the attack was part of a pre-planned operation or occurred during dynamic targeting; and the context in which the attack was planned and conducted, including factors such as the time available, terrain, weather, capabilities, available troops and enemy activity.[951] In context of satellite attacks, additional factors need to be taken into account: the altitude of the targeted satellite, estimation of the amount of space debris, the space debris cloud arrangement and the preliminary time it would take to burn in the atmosphere, the density of satellites in the relative orbit, the relevance of satellite signals on civilian Earth technologies and the amount of injuries or deaths to civilians or damage which may be caused in loss of relevant satellite signal. These circumstances are not easy to calculate, each of them requires specific knowledge and calculations. However, we should yet again remind the precautionary measures which require commanders to do everything feasible to verify compliance with the rule of proportionality. A commander planning an ASAT attack may not justify omission to evaluate collateral damage simply because the environment of the target requires specific knowledge, or the consequences of the attack are hardly predictable. "Everything feasible" would at least require consultations with acknowledged astrophysicists or satellite engineers if the military itself does not have resources to estimate the outcome of the attack (which can hardly be imaginable if the military possessed ASAT weapons). A unique example of Australia in this case may be given

950 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 684.

951 Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment." 16.

where the assessment of collateral damage is part of regular targeting procedures. For instance, Australian Armed Forces use a five-level collateral damage estimation methodology. A formal collateral damage estimation is undertaken for every target as part of both this target development phase and the subsequent capabilities analysis phase. Targeting and operations staff assess the size, shape and construction of protected facilities, weapon type and size for infrastructure targets, the accuracy of weapons and fragmentation radius of an explosive device.[952]

Gillard notes that the minimum standard that belligerents must meet is the relying on information that is "reasonably available". Should a belligerent actually possess information over and above what it can reasonably be expected to have in the circumstances, it must make use of it.[953] In other cases when information is not available, however, a reasonable person would know that such information is available elsewhere, a prudent commander should seek to acquire additional information, otherwise, would risk breaching the complex process of proportionality assessment.

Even though the collateral damage is in fact foreseeable, it may still not unfold due to specific circumstances. Therefore, some scholars add estimation of likelihood into the assessment of collateral damage procedure.[954] Foreseeability relates to expectance while the likelihood – to probability. When the chances of expected collateral damage are very low, that is, unlikely – the attack may still be legitimate even if the disproportion of collateral damage is foreseeable. For instance, targeting GNSS satellite at night would less likely cause damage to the civilian aircraft which usually operates during the day. On the other hand, it does not automatically mean that the attack would be proportionate, since GNSS network is used in multiple other sectors.

3.8.5. Reverberating effects of attacks

Reverberating effects of attacks have been described as "the effects that are not directly or immediately caused by attack, but are nonetheless a consequence of it."[955] Under this definition, reverberating effects are wide ranging. It is knowledgeable that military operations may not only result in deaths of civilians or damage to civilian objects, but also in prolonged effects of contaminated water resources, economic stagnation, unemployment, migration, etc. Destruction of a satellite is rarely an end-goal of a satellite attack. The goal is the disruption of satellite signal transmission. Accordingly, a destroyed satellite does not offer military advantage *per se*. It is the disruption

952 Department of Defence of Australia, OPERATIONS SERIES ADDP 3.14 TARGETING. 4-8–4.9, para 4.16.

953 Gillard, "Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment.", 17.

954 Gillard. 17.

955 ICRC, "ICRC Report on Expert Meeting," in *Explosive Weapons in Populated Areas: Humanitarian, Legal, Technical and Military Aspects* (CHAVANNES-DE-BOGIS, 2015), https://www.icrc.org/en/doc/assets/files/publications/icrc-002-4244.pdf.

of satellite signal transmission (or a transponder responsible for signal transmission function) that leads to the reduced military potential of the adversary. Certain satellite signal transmission failure may also cause negative effects on civilian environment. In context of principle of proportionality, it is important to comprehend whether collateral damage ends with primary effects of attacks or extends to infinite layers of causality. For instance, a kinetic kill vehicle's collision with a satellite would not only generate space debris and break signal transmission (primary effect) but also the generated space debris might collide with other space assets (secondary effect), the loss of satellite signal might lead to malfunction of infrastructure on the Earth (secondary effect) and the malfunction of infrastructure on Earth could lead to injuries and deaths of civilians (tertiary effect). Should all these circumstances be taken into account when planning ASAT activities?

The question of reverberating, else called "knock-on", "indirect", "second order", "third order" effects is not new and still an open question."[956] In 1992, Kalshoven made a remark about long-term effects of war in context of Operation Desert Storm. He asked: "[t]he question is whether military planners could and should have included such potential aftereffects in their calculations, to the point of modifying their plans so as to avoid them?"[957] Kalshoven contemplated: "[i]t would be wonderful if the law provided an affirmative answer to this question, but I am not convinced that it does so. For one thing, the case is not one of straightforward causation of damage for which the attacker can be held responsible. Furthermore, and more importantly, modern warfare must be expected to cause considerable disruption of societal life in any developed society. In this light it appears highly unlikely that the law of armed conflict could require a belligerent to refrain from pursuing legitimate war aims with the legitimate means at its disposal and against legitimate military objectives, simply in order to avoid such adverse aftereffects."[958] Schmitt emphasized that "[r]everberating effects are becoming central in assessing contemporary combat operations."[959]

In 2017, ICRC launched an annual Conference Cycle called "War in Cities" the aim of which is to draw attention on urban warfare and the wide range of collateral effects that are caused merely by attacks on military objectives. Electricity, health care, water, waste-water collection and treatment, and solid waste disposal are only few examples of interconnected and interdependent urban services. A damaged electrical transformer can cut the power to a water booster pumping station, disrupt the water supply in certain

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956 Marco Sassòli, *International Humanitarian Law: Rules, Controversies, and Solutions to Problems Arising in Warfare* (Cheltenham: Edward Elgar Publishing Limited, 2019). 361.

957 Frits Kalshoven, "Implementing Limitations on the Use of Force: The Doctrine of Proportionaliy and Necessity. Remarks by Frits Kalshoven," *American Society of International Law Proceedings* 86 (1992): 39–45. 45.

958 Kalshoven. 45.

959 Michael N. Schmitt, "The Law of Targeting," in *Perspectives on the ICRC Study on Customary International Humanitarian Law*, ed. Elizabeth Wilmshurst and Susan Breau (Cambridge: Cambridge University Press, 2007).

urban areas and buildings, such as hospitals.[960] Health-care facilities may be affected by the explosive weapons in many ways: electricity and water supplies may be cut off, the staff may be killed, injured or unable to get to work, blood stocks may decrease because regular blood donors are unable to access health-care facilities.[961] These reverberating effects could eventually lead to worsening of health or deaths of the treated patients. Zeitoun and Talhami noted that the reverberating effects in urban areas primarily depend on the extent of the damage to the functionality of a specific service and that the reverberating effects of explosive attacks in urban areas are "reasonably foreseeable", hence, requiring adequate proportionality assessment.[962] Sassoli gave an example of even further stretch of reverberating effects: "[g]oing a step further, one could wonder whether someone attacking a military objective in the Strait of Hormuz between Iran and Oman must take the immediate rise of oil prices caused by such an attack into account that may make certain people elsewhere in the world die from cold or hunger because they can no longer afford to buy the oil necessary to cook their food or to heat their homes – at least if such effects were, by hypothesis, perfectly foreseeable."[963]

Indeed, many more examples may be provided to show even further stretch of reverberating effects among civilians. At some point it may even be said that reverberating effects never end. ICRC acknowledges that it is neither practical, nor possible for commanders to consider all possible effects of an attack. However, ICRC considers that those reverberating effects that are foreseeable in the circumstances must be taken into account.[964] In 2011, International Law Association formed a study group (hereinafter – ILA Study Group) to make a report on legal challenges coming from the 21st century conduct in hostilities. One of the questions the study group elaborated was how far the indirect incidental damage is geographically or temporally removed from the original attack, or whether it is a question of foreseeability. The ILA Study Group agreed that foreseeability is the relevant criterion and that there is an obligation to take into account all indirect harm that can reasonably be foreseen by a reasonably well-informed person.[965] The ILA Study Group concluded that incidental harm should be

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960 *See* Mark Zeitoun and Michael Talhami, "The Impact of Explosive Weapons on Urban Services: Direct and Reverberating Effects across Space and Time," *International Review of the Red Cross* 98, no. 1 (2016): 53–70. 56-57.

961 ICRC, "ICRC Report on Expert Meeting." 14.

962 Zeitoun and Talhami, "The Impact of Explosive Weapons on Urban Services: Direct and Reverberating Effects across Space and Time." 68.

963 Sassòli, *International Humanitarian Law: Rules, Controversies, and Solutions to Problems Arising in Warfare*. 362.

964 International Committee of the Red Cross, "International Humanitarian Law and the Challenges of Contemporary Armed Conflicts," in *32nd International Conference of the Red Cross and Red Cressent* (Geneva, 2015), 1–61, 52, https://www.icrc.org/en/download/file/15061/32ic-report-on-ihl-and-challenges-of-armed-conflicts.pdf.

965 Humanitarian Law, "Final Report ILA Study Group on the Conduct of Hostilities. The Conduct of Hostilities Under International Humanitarian Law: Challenges of 21st Century Warfare," *Yearbook of International Humanitarian Law* 19 (2006): 287–336. 309-310.

assessed from the attacker's perspective based on what was known or should have been known on the basis of information available from all sources at the time of the attack and what was reasonably foreseeable in that situation.[966] Authors of Tallinn Manual 2.0 shared the same view that all reasonably foreseeable consequences should be taken into account when assessing proportionality.[967]

Although foreseeability of collateral damage seems to be reasonable explanation, however, IAP uses the term "expected" instead of "foreseen". It should be noted that the notion "expected" has different weight compared to "foreseen", "likely", "possible", "probable". Foreseeability connotes to possibility while expectation to probability. If we could grade the future outcome of certain activity, the foreseeability of the result would most certainly be vaguer than the expectedness. For instance, a commander may foresee that the destruction of electrical power grid could indirectly cause deaths in a hospital which would eventually lose power to sustain lives of patients. But such a result may only be foreseen if no additional information is available. The deaths in the hospital would be more likely to be expected if additional information provided the fact that the hospital is actually connected to the power line providing electricity from the targeted power grid, that the hospital has no alternative energy sources (such as electrical power generator) and there are patients whose lives depend on medical electrical devices. In first case, deaths of patients would be foreseeable while in the second case – expectable. Therefore, we may question whether ILA Study Group and ICRC interpreted the text of IAP correctly invoking a vaguer standard of foreseeability rather than expectedness. On the other hand, interpreting the assessment of collateral damage in a more restrictive way (as being probable and not only foreseeable) would probably undermine the balancing nature of IHL (see "3.8.1. General remarks"). If only expectable (or probable) disproportionate collateral damage was estimated, most of the attacks balancing on the legality line could be justified. Commanders could defend their decisions by simply arguing that although collateral damage may have been foreseen, it was not proven to be expected (probable). Selection of terms in interpreting the treaty text is important, hence, requiring not only linguistic but also teleological explanation unfolding the intent of the drafters. The *travaux préparatoires* of IAP indicates that by using the term "expected" commanders were actually given certain level of discretion in estimating proportionality. During the drafting process of IAP, some delegations preferred the use of words "which risks causing" instead of "which may be expected to cause", some delegations suggested using "would be expected" instead of "may be expected". However, none of these suggestions were adopted. The adopted provision "which may be expected to cause" allows for a fairly broad margin of judgment. Several delegations regretfully stressed this fact. In contrast, other delegations commended the fact that in future military commanders would have a universally recognized guideline as regards their responsibilities to the civilian population during

966 Law. 311.

967 Schmitt, *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 343-344, 416, 419-420.

attacks against military objectives.[968] It is clear that the language adopted in IAP is less restrictive than was proposed by some delegations which, according to Jensen, allowed the military commander more discretion in his attacks.[969] Having in mind the fact that the proportionality rule was adopted as such with an intent to place a less restrictive standard in the assessment of collateral damage, it may not be simply said that foreseeable effects contradict the expected effects notion, especially bearing in mind that foreseeable effects are also often predictable. More to add, state practice seems to suggest that "foreseeable" is the standard to measure collateral damage.

Danish LOAC Manual interestingly stipulates that collateral damage "need not follow directly from the attack, but there should be more of a direct than merely indirect connection."[970] According to Danish LOAC Manual, timing is relevant in determining causal link between the attack and collateral consequences. It states: "the longer time that passes between the attack and the occurrence of the collateral damage, when other factors, depending on the circumstances, have an opportunity to interfere with an otherwise predictable course of events. This may have a major influence on whether the link between the attack and the collateral damage is estimated to be sufficiently direct."

The U.K. holds that the foreseeable effects of the attack should be taken into consideration of principle of proportionality. The UK LOAC Manual gives example: a precision bombing attack of a military fuel storage depot is planned but there is a foreseeable risk of the burning fuel flowing into a civilian residential area and causing injury to the civilian population which would be excessive in relation to the military advantage anticipated, that bombardment would be indiscriminate and unlawful, owing to the excessive collateral damage."[971]

The position of United States is somewhat different from those mentioned before. For instance, the United States LOAC Manual stipulates that "[t]he expected loss of civilian life, injury to civilians, and damage to civilian objects is generally understood to mean such immediate or direct harms foreseeably resulting from the attack."[972] According to United States LOAC Manual, remote harms do not need to be considered in applying proportionality. Such an exclusion of remote harms is based on the difficulty in accurately predicting such collateral damage from the attack (including the possibility of unrelated or intervening actions that might prevent or exacerbate such harms) as well as the primary responsibility of the party controlling the civilian population

968 Pilloud et al., *Commentary on the Additional Protocols: Of 8 June 1977 to the Geneva Conventions of 12 August 1949*. 684.

969 Eric Talbot Jensen, "Unexpected Consequences From Knock-On Effects: A Different Standard for Computer Network Operations?," *American University International Law Review* 18, no. 5 (2003): 1145–88. 1181.

970 Danish Ministry of Defence and Defence Command Denmark, Military Manual on International Law Relevant to Danish Armed Forces in International Operations. 311.

971 Ministry of Defence, JSP 383: The Joint Service Manual of the Law of Armed Conflict. 86.

972 Department of Defense, Department of Defence Law of War Manual (Updated). Para. 5.12.1.3.

to take measures to ensure that population's protection.[973] On the other hand, United States LOAC Manual gives an example of destruction of power plants: if by such destruction it would be expected to cause the loss of civilian life or injury to civilians very soon after the attack due to the loss of power at a connected hospital, then such harm should be considered in assessing whether an attack is expected to cause excessive harm. In other words, according to United States LOAC Manual, remote harm should not be calculated, unless it appears soon after attack. The attacker should not be required to consider the economic harm that the death of an enemy combatant would cause to his or her family, or the loss of jobs due to the destruction of a military facility employing civilian workers. Similarly, according to the United States LOAC Manual, in determining the expected loss of civilian life, injury to civilians, and damage to civilian objects, the attacker would not be required to consider the possibility that a munition might not detonate as intended and might injure civilians much later after the attack. This is due to the difficulty in assessing such risks and the responsibility of the party controlling the territory and the civilian population to take steps with regard to the protection of the civilian population from unexploded ordnance.[974]

The "reasonable foreseeability" is a commonly applied standard when estimating reverberating effects. With regard to this thesis, the question may be asked what can actually be reasonably foreseeable in the aftermath of satellite attack? The answer to this question would require special satellite engineering knowledge as lawyers might only advice what level of certainty about the object or the effects of the attack needs to be possessed. Concerning reverberating effects of satellite attacks, there is no question that commanders should seek for advice from engineers (unless they possess that knowledge). Only after possessing relevant degree of knowledge about the targetable satellite, it may reasonably be estimated what would happen if it was destructed. On the other hand, even the knowledge of satellite functions may not help with the collateral damage estimation, as in most cases collateral damage might depend from satellite signal user's activities at the moment of attack. This makes collateral damage hardly ever precisely foreseeable, and, accordingly, principle of proportionality hardly implementable. Similarly, in context of kinetic ASAT attacks, it is impossible to precisely determine in which directions the debris would waft and what would be the reverberating effects of such an attack. In legal words, reverberating effects of kinetic satellite attacks may not be reasonably foreseeable as required by law. However, that does not mean that reasonably unforeseeable effects are permissive. In cases when it is impossible to predict the effects of an attack, the attack itself may qualify as indiscriminate, similarly as in case of blind-shooting. IHL requires to estimate proportionality before every planned attack. Having no means or possibility to foresee the collateral effects of an attack, even reverberating ones, means that an attack may not be waged. In context of kinetic satellite attacks, it is expectable (probable) that certain amount of space debris will be created. Dependently from many circumstances (such as how crowded

973 Department of Defense. Para. 5.12.1.3.

974 Department of Defense.

the orbit is), it may also be expectable (probable) that space debris will eventually pose risk to other objects in space. Even though the damage is expected, the amount of it is inestimable. Therefore, it is important to understand that principle of proportionality (including duty to estimate reverberating effects of an attack) requires not merely estimation whether collateral damage will be caused, but estimation of the amount of collateral damage. Otherwise, principle of proportionality would not be implementable, because the military advantage and collateral damage could not be compared. In cases when collateral damage is expected, but the amount of it may not be estimated, the attack should not be waged as it would not meet the requirement to of conducting only proportionate (discriminate) attacks. Concerning reverberating effects, it would seem reasonable to require targeting decision makers to estimate the amount of damage only if damage itself is expectable. So, the duty to foresee events of the attack and estimate their collateral effects stretches only in so far as damage is foreseeable, not the amount of damage. That leads to conclusion that kinetic ASAT attacks may not be implemented if the amount of damage is inestimable. In most cases, the amount of damage that space debris from the shattered satellite might cause is inestimable and that leaves most of kinetic ASAT attacks hardly compatible with principle of proportionality. In case of non-kinetic attacks leaving no space debris, collateral damage should be estimated only when it is foreseeable. For instance, it may be estimated that the jamming GNSS satellite signals may pose risk to certain economic sectors, it may be even expected that certain amount of damage will be made to civilians and civilian objects. But duty to estimate the amount of damage in the chain of reverberating effects would end when damage would not be foreseeable. For example, the attacking party may not be aware that train traffic of the opponent is regulated by programmed algorithms using GNSS data. That means that the attacking party would not be required to estimate the potential damage of the train traffic control system failure.

3.8.6. Applying proportionality to satellite targeting

The loss of satellite signals may have various consequences, some of them may result in deaths or destruction, others merely cause inconvenience. Principle of proportionality is applicable only when the estimated effects of attack constitute damage. The loss internet, inability to withdraw funds from bank accounts, loss of communication network signals or any other similar effects of attacks is inconvenience and not subjected to proportionality assessment.

In most cases, it is difficult or even impossible to determine all end-users of satellite signals and, therefore, accurately predict collateral effects of attacks. IHL requires neither one hundred percent accuracy when identifying targetable object as a military objective, nor precise calculation of the collateral damage. However, when planning attacks commanders should act in good faith and make assessments when the military advantage or collateral damage is foreseeable. In other words, attack planners are required to act reasonably with due diligence to all circumstances that might negatively affect the general duty of parties to the conflict to spare civilians and civilian objects.

The Author suggests that the assessment of military advantage should be made on single types of attacks if the effects of single attacks are inestimable. For instance, if certain GNSS network is being attacked, the military advantage may be estimated as a result of the whole GNSS attack which could constitute either single launch of a missile on a specific satellite or multiple launches on different satellites (in case of kinetic attacks). If the attack on satellite involves only a part of military operation (having other types of attacks on t

he ground, sea or air) then the military advantage of a satellite attack should be estimated separately. The key in assessing military advantage is that the advantage is actually foreseeable. An attack on a satellite which does not offer a foreseeable military advantage should not be implemented. Any attack should be implemented with concern of injuries or deaths to civilians, damage or destruction to civilian objects.

While assessing collateral damage it is important to focus on causation and foreseeability. Causal link between a satellite attack and collateral damage needs to be established. The best way to achieve this is to answer a question whether any foreseeable injuries or deaths to civilians, damage to or destruction of civilian objects would occur if the attack on a satellite would not be happened. The attacking state should take into consideration all expectable collateral damage without any expectancy of its mitigation from a third party. In context of foreseeability of collateral damage, certain assessable factors might help to follow proportionality rule. The factors to consider are: the altitude of the targeted satellite, estimation of the amount of space debris, the space debris cloud potential arrangement and the preliminary time it would take to burn in the atmosphere, the density of satellites in the relative orbit, the relevance of satellite signals on civilian Earth technologies and the amount of injuries or deaths to civilians or damage which may be cause in loss of relevant satellite signal.

One of the most difficult questions regarding proportionality is the assessment or even prediction of causal steps which cause collateral damage. It is suggestable that proportionality is assessed as long as the amount of collateral damage is foreseeable. If only damage, but not the amount of damage in the planned attack is foreseeable, such an attack may not be waged because military advantage and collateral damage are incomparable. For example, it may be estimated that destroying specific satellite might cause certain collateral effects on infrastructure using such satellite data. Such collateral damage is foreseeable. However, it is also known that kinetic satellite attack would create pieces of space debris the movement of which is unpredictable. Since reverberating effects of attacks are included in proportionality assessment, it is questionable whether merely damage (the creation of space debris), but not the amount of damage (the likelihood of future collisions between generated space debris and other space objects) suffices to prudently apply principle of proportionality.

4. LEGAL REVIEW OF ASAT WEAPONS

4.1. General remarks

As of this moment of thesis, multiple questions regarding satellite targetability and targeting have been presented, considered, and answered. Most of the addressed rules are applicable only in case of an armed conflict and only for military operations constituting attacks. Nevertheless, in few instances, IHL entrenches its spirit to peacetime conduct as well. It does so in sophisticated ways one of which requires legal evaluation of means and methods of warfare not yet disposed, but about to be so in the near future. Although the topic of thesis clearly connotes to armed conflict conduct, it would not be disclosed in full, if we left the preparatory stage of armed conflict – ASAT weapon development – without due legal evaluation. Indeed, as it is shown further, the requirement to review new weapons demands the modelling or imitation of armed conflict. We may even argue that this requirement serves as the corridor between peacetime conduct and hostilities and may not be depicted simply as peacetime conduct. This topic has risen as a consequence of kinetic ASAT testing practice which, in fact, is condemned by the growing number states.[975]

The successful, although mostly criticized, China's kinetic ASAT test in 2007 generated an orbital ring of space debris spread from the altitude of 175 km to as high as 3 600 km.[976] As it is well known China and all other states which successfully targeted satellites using kinetic energy weapons directed attacks against their own space infrastructure. For this reason, none of these activities invoked application of IHL which implicitly requires the attacks to be directed "against the adversary, whether in offence or in defence."[977] If any of previous kinetic satellite attacks were directed against a satellite belonging to another State, such an event would have invoked application of IHL because of their destructive nature qualifying as attacks under IAP.[978] It would seem that kinetic satellite testing in peacetime does not fall under IHL rules, since IHL primarily regulates conduct in hostilities. That premise is not entirely correct, as IHL lists multiple rights and obligations on states to be applied in both, peacetime and wartime, some of them only in peacetime. For example, Article 49(1) of IAP obliges the states to disseminate IHL in time of peace as well as in time of war; Article 14 of the GCIV encourages states to establish in their own territory hospitals and safety zones and communicate the list to other states in peace time, as well as after the outbreak of hostilities.

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975 Park Si-soo, "UK, South Korea Join ASAT Test Ban, Raising like-Minded Countries to Seven," Space News, 2022, https://spacenews.com/uk-south-korea-join-asat-test-ban-raising-like-minded-countries-to-seven/.

976 Brian Weeden, "2007 Chinese Anti-Satellite Test Fact Sheet," Swfound, 2010, https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf.

977 IAP, art. 49(1).

978 *See* "4.3. The concept of attacks under IHL".

One of peacetime obligations is listed in Article 36 of the IAP. It requires the states to carry legal new weapon reviews before their use independently from the presence of the armed conflict. This obligation is not entirely new, since 1868 St. Petersburg Declaration addressed the importance of legal scrutiny in development of future weapons:

"The Contracting or Acceding Parties reserve to themselves to come hereafter to an understanding whenever a precise proposition shall be drawn up in view of future improvements which science may effect in the armament of troops, in order to maintain the principles which they have established, and to conciliate the necessities of war with the laws of humanity."

A seemingly broad and over 150 years old idea of legal weapon review only once was reiterated in another international instrument. The IAP Article 36 imposed an obligation which in national legal systems should have attained a formal self-control mechanism preventing the future use of illegal weapons:

"[I]n the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party."

This is a relatively rare example of binding obligation imposed on states by IHL and which is aimed to be applied in times of war and peace. In the absence of an armed conflict, even if a state remains neutral, a legal review assessing the compatibility of a weapon with IHL must be conducted. Failure to review is a breach of IHL, with the state being held internationally responsible for its failure to comply.

Despite the fact that Article 36 of the API clearly aims to prevent the use of legally incompatible weapons, its text is broad and repetitive.[979] Any verbatim reading of Article 36 points to the fact that it is not evident at which stage of weapon development the review should be drafted. Does the word "development" also mean "testing" of the weapon and if the review was negative, should acquisition or development procedures be terminated? In case the review needs to be drafted prior to weapon testing stage and in case of negative review the further weapon development procedures, including weapon testing, need to be halted, it might be that Article 36 actually imposes certain restrictions under which the legality of kinetic ASAT testing may be questioned.

Neither the text of IAP, nor the ICRC IAP Commentary offer the answers to the afore raised questions. Evidently, it is the strategic interest and common practice of states to classify inventions related to weapon technology, modifications or adaptations of weapons systems. Despite the fact that Article IX of the OST requires to undertake international consultations prior to potentially harmful interference with activities of other States, China's 2007 kinetic ASAT test showed that weapon testing or other stages of weapon development are rarely publicly announced, even though

979 Term 'weapon' in Art. 36 is used along with term 'means' of warfare and under IHL 'means of warfare' has primary meaning of weapons of warfare. Y. Dinstein, *The Conduct Of Hostilities Under The Law Of International Armed Conflict* (2010) (hereinafter Dinstein Conduct of Hostilities), at 87.

international instruments require to do so. The unambiguities found in Article 36 and the inconspicuous state practice implementing this Article require deeper analysis of the obligation to review new weapons. The Article will further be analyzed in detail word by word to uncover its meaning.

4.2. Terminology of Article 36

The word "study" implies a process during which knowledge is gained. However, this word should be read in context of the whole article, because otherwise interpretation of Article 36 may be misleading. It would be absurd to require a state to conduct legal review of weapons developed by other state, despite the literal meaning of Article 36 would require so. Similarly, in case the intelligence agency gathered information about newly developed weapons of another state or even acquired them without any further intentions to their use, it would be irrational to require to make a legal review. Even if state organs studied all of the data about newly developed weapon systems of their potential enemy in order to take defensive measures against a potential attack, they would not be required to undertake a legal review for such "study". To better understand this word, we must add, "with a view to development or acquisition", since it appears to be drafters' of API intention.[980]

Only new weapons but not new technology in general are subjected to legal reviews. Boothby notes that "study" refers to study of weaponization of a technology which is "the assessment of how a technology can be adapted or applied so as to cause death, injury, damage or destruction in the context of an armed conflict."[981] And "it is a weapon, means or method that must be studied for the obligation to review new weapons to arise, not, for example, a technology which might at some point in the future be capable of development into a weapon, means or method."[982]

State organs having the power of budgetary fund disposition would hardly ever acquire new weapons blindly without prior analysis of capabilities of these weapons or their adaptability to existing weapon's systems. Accuracy, destructive power, cost of repair, the need of additional instructions of use, age and weapon condition in general – all these questions should naturally be raised by the interested State. These evaluations fall under "study". Therefore, it may be claimed that "study" stage is the earliest stage in either the manufacture of a weapon, or the acquisition of already manufactured weapons by another state or private organisation. It would be hard to argue that a new weapon was simply developed or acquired blindly, without detailed analysis of its characteristics, military needs, and how that weapon would fulfil such a need. Only after prudent study of the weapon other stages referred in Article 36 open.

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980 W. H. Parks, 'Conventional Weapons and Weapons Reviews' (2005), 8 *Yearbook of International Humanitarian Law* 55, at 113, (hereinafter Parks Conventional Weapons).

981 W. H. Boothby (ed.), *New Technologies And The Law In War And Peace* (2019), at 18.

982 W. H. Boothby, *Conflict Law: The Influence Of New Weapons Technology, Human Rights And Emerging Actors* (2014) (hereinafter - Boothby Conflict Law), at 168.

The importance of legal review at this "study" stage is evident because a negative review would most likely deter politicians from spending state funds on a weapon that could not be legally used, or even modify a weapon in accordance with the laws of their usage. It is critically important to conduct a legal review at the earliest possible stage, not only to make reasonable expenditures, but also to acquire the exact knowledge about the weapon.

Other stage of weapon realisation mentioned in the Article is "development". Broadly speaking, weapon development is the process of materialization of an idea into an actual weapon. This covers all stages of the successful creation of a weapon – from design and engineering, to testing the prototype, and perhaps assigning new functions to old weapons or otherwise modifying them. Every stage must be completed before a manufactured or modified weapon is ready for use. Boothby, notes that "development" involves application of materials, equipment and other elements to form a weapon and includes improvement, refinement and testing prototype weapons to achieve its optimal performance.[983] Since the procedure of weapons development consists of many other processes, it is logical that each process carries with it a legal review. Otherwise, a State developing a new weapon could conduct legal review at "study" stage and further develop a weapon without any legal scrutiny. Every stage could have a separate review form or one constantly modified review form.

Article 36 clearly indicates that the purchase of weapons ("acquisition or adoption") also requires legal review. Bear in mind that even if legal review was previously made by the weapons seller or manufacturer, under Article 36 another legal review must be drafted by purchaser before the purchase is finalised. As Parks notes, one state's legal review does not bind other states, therefore another government's actions may not alter such obligation.[984] Authors of the Commentary of API stressed out that "purchaser should not blindly depend on the attitude of the seller or the manufacturer, but should proceed itself to evaluate the use of the weapon…"[985] It is therefore possible that the same new weapon had multiple legal reviews from multiple states which either manufactured or purchased such a weapon.

A weapon may be acquired without purchase, as it may be donated, stolen, taken as war prize. Many legal scholars are of the view that transaction is not the only descriptive notion of 'acquisition' or 'adoption', since weapons may be obtained illegally (e.g., stolen) or taken as war price without any transaction. Every newly possessed weapon that has never been possessed before by a state, whether legally permanently by contract of purchase or donation, whether legally temporarily by contract of rent or lent, whether obtained illegally, should be subject to legal review. Otherwise, a legal loophole would be created to ignore obligations under Article 36 and the illegal weapon would be used in the field.

Further, although API requires to review new weapons, a 'new weapon' does not

983 Ibid.

984 Parks Conventional Weapons, 114.

985 ICRC IAP Commentary, 426.

necessarily mean 'never used' or 'recently manufactured'. A 'new weapon' is the one that the purchasing state does not yet possess, although it may have been manufactured some time ago been in the possession of many other states.[986] This is also the case with weapon modification, for example, if an old weapon is modified to change its characteristics or functionality or add new ones (modification of targeting mechanism to achieve better precision, change of characteristics of launch mechanism, modifying a weapon to be water resistant, etc.), that weapon should also be subject to legal review. So technically, old weapons are also subject to legal analysis if they are purchased for the first time or modified.

The words "methods" and "means" include weapons in the widest sense, as well as the way in which they are used.[987] Means of warfare are weapons and weapons systems, whereas method of warfare refers to tactics, techniques and procedures by which hostilities are conducted.[988] Means of warfare are not only physical tools capable to cause harm (injury or death) to persons or damage (partial or total; temporal or permanent) to objects. Bacteria, computer programs, directed energy, and even signals may invoke similar destructive effects as conventional weapons do. Under IHL, both the weapons and its launch systems are means of warfare.

Although "means and methods" of warfare is a common combination of words in IHL (even used in the title of API part III), conjunction "or" used in the text instead of common "and", it should be noted that the conjunction "or" should not mean that states are free to choose which of the two, namely weapons or the methods, they must review. It follows that the conjunction 'or' should mean either "means", either "methods" or both, since the aim of those who drafted the API intended to prevent the acquisition of illegal arms or at the very least limit their use.

Any weapon could be used in breach of IHL requirements. For example, a computer program having no code to distinguish military and civilian objects attacks all end-users indiscriminately. It does not mean, however, that each weapon review should include all possible legal evaluations, and of all possible circumstances in which the weapon could be used. That would be unreasonable and unimplementable. "Some or all circumstances" require states to legally evaluate "normal or expected" use of the weapon and draw lines when that "normal or expected" use of weapon would be illegal.[989]

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986 I. Daoust, R. Coupland and R. Ishoey, 'New wars, new weapons? The obligation of States to assess the legality of means and methods of warfare' (2002), 84 *International Review of Red Cross* (IRRC) 345, at 352 (hereinafter Daoust et. al. New Wars); J. McClelland, 'The review of weapons in accordance with Article 36 of Additional Protocol I' (2003), 85 IRRC 397, at 404.

987 K. Lawand, 'A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977' (2006), 88 IRRC 931, at 937 (hereinafter Lawand Guide).

988 M. N. Schmitt, 'Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics' (2013), 4 *Harvard National Security Journal Features* 1, at 27 (hereinafter Schmitt Autonomous Weapon Systems).

989 ICRC IAP Commentary, 424; Lawand Guide, 938.

Similarly, the conjunction "or" should not allow the states to decide for themselves which circumstances (some or all) should be evaluated. As Fry argues, the use of "or" indicates addition, similar to the use of "and", and is not an alternative.[990] If that was an alternative, a state would choose "all" circumstances and, naturally, would have a positive review, even if in "some" circumstances the use of weapon or method was illegal. In that case, partially illegitimate weapons or methods could be fully "legitimized" under Article 36 mechanism.

According to Article 36, States are required to review new weapons in light of their present obligations. Not only API, but also other treaties such as the Convention on Certain Conventional Weapons and its additional protocols, as well as customary international law should be taken into account. A state may sign a new treaty, modify existing one or withdraw from one. A legal weapon may one day become illegal and otherwise. Therefore, it is necessary to evaluate the scope of obligations during the scripting process of the legal review. Accordingly, if the review is already drafted and the scope of obligations which could affect the legality/illegality of a weapon change, a review should be modified or redrafted.

4.3. Timing of legal review

Article 36 does specify at which stage the review should be drafted. There are different interpretations in this context. Firstly, the text of Article 36 suggests that any phase of weapon materialization or possession, whether it is study or development, or adoption, or acquisition is subject to legal review. This is because all stages are formulated with conjuncture "or". In 2006, the ICRC published a guide aimed to assist states in establishing procedures to determine the legality of the new weapons (ICRC guide). It was initiated by the meeting of experts hosted by the ICRC in 2001 and the Agenda for Humanitarian Action adopted at the 28th International Conference of the Red Cross and Red Crescent.[991] The ICRC guide suggests that reviews should be made at the earliest stages of weapon development (conception/design) and technological weapon development (development of prototypes and testing).[992] If the state purchases a weapon, the review, according to ICRC guide, should take place at the stage of the study of the weapon proposed for purchase.[993] If the state decides to technically modify an existing weapon, review should also take place at the earliest stage.[994] Hence, according to the ICRC guide, review should take place at earliest possible stage and should be made each time development procedure reaches new stage. Accordingly, it

990 J. D. Fry, 'Contextualized Legal Reviews for the Methods and Means of Warfare: Cave Combat and International Humanitarian Law' (2006), 44 *Columbia Journal of International Law* 454, at 472.

991 A Guide To The Legal Review Of New Weapons, Means And Methods Of Warfare. Measures To Implement Article 36 Of Additional Protocol I Of 1977, International Committee Of The Red Cross (2006).

992 Lawand Guide, 23.

993 Lawand Guide, 24.

994 Lawand Guide.

means that if a weapon is manufactured by the state itself, a legal review must be made during conception and design stages – prior to reaching the testing stage. Daoust and others argue it would be logical to determine legality at early stages, during study and development phase and prior to adoption or acquisition.[995] Koplow points out that "at least some categories of ASAT weaponry should be screened out at this initial filter <…> even before testing occurs."[996]

The conjunction "or" could also be understood as an alternative obligation, meaning that the review should be made either at study, either development, either acquisition or either at adoption stage. Copeland argues that "study, development, acquisition or adoption" suggests a singular weapons review obligation, however, he sees practical issues implementing this understanding.[997] So, if legal review was passed in the study stage, this would meet the obligation under Article 36 and there would be no need to pass another legal review at the development stage. The same would apply to adoption or acquisition. However, this interpretation does not sit well with the intent of the drafters of API. According to one of the rapporteurs of the respective Committee during the CDDH adopting API, the 'obligation to make such determinations will ensure that means or methods of warfare will not be adopted without the issue of legality being explored with care'.[998] In other words, the requirement to conduct a legal review is only a tool to achieve the ultimate goal – prevention of the use of illegal means and methods of warfare during armed conflict. If a review was required at only one of the stages, then illegal weapons could pass the procedure and become usable or marketable very easily. Parks underlines the importance of additional "follow-on" review if at any stage substantive changes in the weapon or munitions occurred.[999] Blake and Imburgia define weapon review as an "iterative process."[1000] Some scholars argue that the weapon review process does not end with the use of new weapons, since the effects of the use of new weapons should also be monitored.[1001]

The text of Article 36 is broad enough for us to arrive at an unambiguous understanding of the timing of review, for instance, that it must be made prior to obtaining

995 Daoust et. al. New Wars, 351.

996 Koplow ASAT-isfaction, 1243.

997 Copeland argues that 'study, development, acquisition or adoption' suggests a singular weapons review obligation, however, he sees practical issues implementing this understanding. See D. P. Copeland, 'Legal Review of New Technology Weapons' in H. Nasu, R. McLaughlin (eds.) *New Technologies And The Law Of Armed Conflict* (2014), at 47.

998 ICRC IAP Commentary, 424.

999 Parks Conventional Weapons, 134.

1000 D. Blake, J. S. Imburgia, "Bloodless weapons'? The Need to Conduct Legal Reviews of Certain Capabilities and the Implications of Defining Them as 'Weapons" (2010), 66 *The Air Force Law Review* 157, at 166.

1001 A. Dienelt, 'After the War is Before the War': The Environment, Preventive Measures Under International Humanitarian Law, and their Post-Conflict Impact' in C. Stahn and J. S. Easterday (eds.) *Environmental Protection And Transitions From Conflict To Peace: Clarifying Norms, Principles, And Practices* (2017), at 435-436.

ownership or possession rights to a weapon, or prior to its final production. However, many scholars uphold the first interpretation, requiring a review to be made (or modified accordingly) at each stage. Boothby argues that legal advice should be given during study phase of weapons procurement. Obligation to review first arises when the use of a technology as a weapon or method of warfare is being actively evaluated.[1002] If a weapon or method of warfare is being studied, IHL must be one of the concerns besides technological capabilities of that weapon. Therefore, it would seem logical to have a review of the weapon before technological development procedure starts which means that testing a new weapon without having its review is not compatible with Article 36.

4.4. The consequences of negative legal reviews

While Article 36 requires states to make reviews, it is silent on whether the study, development, acquisition, or adoption procedures should be terminated or modified if the review was negative. The requirement to terminate studying a weapon or weapon system would seem to be unreasonable, since in some cases only after studying a new weapon, it may appear that it is illegitimate. For instance, treaties banning weapons of mass destruction do not prohibit their study.[1003] Despite this, such treaties prohibit their development, including testing. Does that mean that a negative review under Article 36 should have similar consequences?

The answer to that question should lead us to a teleological analysis of Article 36. During the CDDH, some states felt the need to establish a link between general rules placed in Article 35 and concrete prohibitions such as the prohibition to cause superfluous injury or unnecessary suffering, or use of weapons that have indiscriminate effects.[1004] It was suggested, that a special committee be established, which would be responsible for drawing up the list of weapons falling outside IHL. However, this idea was rejected in the plenary meeting. The mechanism of new weapons review is a compromise intended to ensure that future weapons, if used, will not fall outside requirements of IHL.[1005] The rapporteur for Committee III[1006] noted that the determina-

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1002 B. Boothby, 'How Will Weapons Reviews Address the Challenges Posed by New Technologies?' (2013), 52 *Military Law and The Law of War Review* 37, at 39.

1003 E.g. Art. 1 of the Chemical Weapons Convention prohibits development, production, acquisition, stockpiling or retaining, transferring, using, engaging military preparations to use, assisting, encouraging or inducing anyone to use (or produce, develop, acquire, etc.) chemical weapons. Almost identical obligations are listed in Biological Weapons Convention. See Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Art. 1, 1975 UNTS 3; Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Art. 1, 1015 UNTS 163.

1004 ICRC IAP Commentary, 421-422.

1005 ICRC IAP Commentary.

1006 The Conference was sub-divided into three main plenary committees, one ad hoc committee on "conventional weapons", also plenary, to which were added the Credentials Committee and the Drafting Committee, as well as numerous working groups. *Id*., at XXXIII.

tion of the legality of weapons required of states is not intended to create a subjective standard which "is not binding internationally", but aimed to "ensure that means or methods of warfare will not be adopted without the issue of legality being explored with care."[1007] IHL does not limit production or acquisition of certain weapons or their systems which is essentially subjected to the law and policies of disarmament. But it is emphasized in the Commentary of API that even possession of illegitimate weapons has certain limitations – "a State could not knowingly equip itself only with weapons whose use is normally prohibited, without placing deliberately itself in a position in which it would, when the time came, violate the spirit and the letter of the Protocol, in other words, of the jus in bello."[1008]

A fundamental maxim around which weapons law and IHL is built is enshrined in Article 35(1) of API – "the right of the Parties to the conflict to choose methods or means of warfare is not unlimited." It implies the obligation of states to respect rules of international law applicable in situations of armed conflict.[1009] It flows logically that a state should endeavour itself to build arsenal of weapons which future use would not be legally restricted. Article 36 does not include consequences of negative reviews, but it implies obligation towards states to establish internal procedures for the purpose of elucidating the issue of legality.[1010] These procedures are self-regulatory, however, they do not leave the state to choose freely which aspects of weapon use will be included in the review and which will not. For example, a state developing kinetic ASAT weapons should include environmental considerations and possible scenarios of space debris affects to space objects, as well as the predicted lasting effect depending on the altitude of the target. States are also required to take into account IHL when developing and adopting weapons and military tactics – this is part of implementation of IHL process.[1011] Only procedural freedom is vested in states when establishing weapon review procedures – there is no freedom of choice as to in which spectrum of international law a weapon should be reviewed. All existing international obligations of the state need to be examined in the review.

Although it might appear that Article 36 merely requires the drafting of legal review, but in general, the aim of Article 36 is to prevent the usage of illegal weapons and methods by national self-appraisal procedures of legality of the weapon or method. States implementing this article in good faith should not merely seek to have legal reviews, but to have legal weapons instead. Therefore, although there is no clear obligation to terminate "study, development, acquisition or adoption" after having negative legal review, it is clearly expected from states to do so. Dinstein notes, that if "assessment of the legality of a projected weapon leads to the conclusion that its future use

1007 ICRC IAP Commentary, 424.

1008 ICRC IAP Commentary, 425.

1009 ICRC IAP Commentary, 399.

1010 ICRC IAP Commentary, 424 and 427.

1011 The Domestic Implementation Of International Humanitarian Law: A Manual, International Committee of the Red Cross (2015), at 23.

would be in breach of LOIAC, a decision to discard it must be taken at an early phase (preferably, at the laboratory or pre-purchase stage) prior to actual deployment."[1012]

Legal review is not merely a tick-the-box exercise, but a continuous procedure in the course of which a legal weapon or method is created or acquired. It is therefore expected from states to react accordingly after obtaining a negative legal review, that is terminate weapon development or acquisition procedures, or make essential changes in the weapon to legitimize them. Such practice would be in accordance with the aim of Article 36 and general rules of IHL.

4.5. Are ASAT weapons "new weapons"?

The important thing to note is that legal reviews are required only for new weapons, not new targets. Also, as it was said before, new weapons do not necessarily mean they are "new" – old weapons might also be subject to another legal review. So, for example, if an inter-continental ballistic missile without any additional modifications was used to destroy a satellite, a legal review would not be required if it had already been made, even though that weapon was intended to hit new targets. But, if that missile or launch vehicle is modified or engineered specifically to target outer space objects, which means that they change functionality or characteristics, that would count as a "new weapon" subject to legal review.

In its 2007 ASAT test, China used the DongFeng-21 Road-Mobile intermediate range two-stage ballistic missile (IRBM) SC-19.[1013] Although technological aspects of ASAT or other weapons are usually classified, SC-19 ASAT weapon systems before the success in 2007 were tested at least twice[1014]. The system has an infra-red seeker that identifies and tracks its moving target and a kinetic-kill vehicle KT-1 which is a specifically modified version of a DF-21 launch vehicle.[1015] The two-stage missile also reflects the fact that it differs from inter-continental ballistic missiles which have three stages of flight – ascent, midcourse phase and descent, including terminal phase to enable it to re-enter the Earth's atmosphere.[1016] ASAT weapons have two phases – they are not meant to eventually land and hit targets on Earth. In 2008 USA conducted operation "Burnt Frost", downing a satellite with an SM-3 interceptor. The latter was modified to three sea-based missile defence interceptors, and the system's command and control

1012 Dinstein Conduct of Hostilities, 87.

1013 B. Weeden, 'Anti-Satellite Tests in Space – The Case of China', *SECURE WORLD FOUNDATION* (16 August 2013), available at https://swfound.org/media/115643/china_asat_testing_fact_sheet_aug_2013.pdf.

1014 Ibid.

1015 J. Mackey, 'Recent US and Chinese Antisatellite Activities' (2009), 155 *Air & Space Power Journal* 83, at 85.

1016 Royal Australian Air Force, 'Three Stages of the Inter-Continental Ballistic Missile (ICBM) Flight' (2018), available at http://airpower.airforce.gov.au/APDC/media/PDF-Files/Pathfinder/PF305-Three-Stages-of-the-Inter-Continental-Ballistic-Missile-Flight.pdf.

software.[1017] Thus, in operation "Burnt Frost" a unique weapon system was made to specifically target a satellite. Russia's PL-19 Nudol is a system specifically created to target communication and imagery satellites in low Earth orbit[1018] and was tested at least five times.[1019] The most recent kinetic ASAT test implemented by India in 2019 ("Mission Shakti") also used a modified version of a previous Prithvi Defence Vehicle anti-ballistic missile interceptor.[1020]

According to Article 36 of API, it is known that weapon systems used in ASAT tests are either mostly new or modified old weapon systems considered to be "new weapons or methods", and as a consequence are subject to legal reviews. Unless the obligation to review new weapons has not formed to be customary in nature, all states that have conducted kinetic ASAT tests must have had made their weapons systems' legal reviews. Since China is party to IAP, the assumption is that it should have drafted the review before ASAT test in 2007.[1021]

4.6. Legal review of ASAT weapons

It has been argued that the use of kinetic ASAT weapons during armed conflict raise numerous issues related to IHL. Principle of proportionality, unforeseeable reverberating effects of signal loss or debris movement and long-lasting damage to the natural environment make the legal use of kinetic ASAT weapons extremely limited. It has also been shown that the use of non-kinetic ASAT weapons in some cases would may as well breach principle of proportionality, because the non-kinetic force causing signal loss or disturbance, may as well cause kinetic damage as a cascade effect. Lastly, it was discussed that outer space is natural environment under IHL and space debris constitutes damage to it. The formation of space debris after the use of an ASAT dependently from the method of its use, may reach the upper limit of damage (widespread, long-term and severe) to the natural environment which is unexceptionally prohibited by IHL. The legitimacy of activities which cause damage to the natural environment is not conditioned by estimations and calculations required for successful implementation of requirements under principle of proportionality – natural

1017 T. Ross, 'WikiLeaks: US and China in military standoff over space missiles', *TELEGRAPH* (2011), available at https://www.telegraph.co.uk/news/worldnews/wikileaks/8299495/WikiLeaks-US-and-China-in-military-standoff-over-space-missiles.html.

1018 A. Macias, M. Sheetz, 'Russia conducted another successful test of an anti-satellite missile, according to a classified US intelligence report' (2019), available at https://www.cnbc.com/2019/01/18/russia-succeeds-in-mobile-anti-satellite-missile-test-us-intelligence-report.html.

1019 V. Popovkin, 'Space Threat 2018: Russia Assessment' *AEROSPACE* (2018) available at https://aerospace.csis.org/space-threat-2018-russia/.

1020 M. Langbroek, 'Why India's ASAT Test Was Reckless' *THE DIPLOMAT* (2019), available at https://thediplomat.com/2019/05/why-indias-asat-test-was-reckless/.

1021 It is presumed that same system was tested, although, unsuccessfully, in 2005 and 2006. See Z. Keck, 'China Secretly Tested an Anti-Satellite Missile', *THE DIPLOMAT* (2014) available at https://thediplomat.com/2014/03/china-secretly-tested-an-anti-satellite-missile/.

environment protection regime is self-contained compared to other interrelated targeting rules. In other words, no military necessity may justify widespread, long-term and severe damage to natural environment.

All estimations related to the use of the weapons in wartime need to be indicated in the legal review in peacetime. It may seem to be contradictory to apply the rules of warfare for the activities directly unrelated to the use of armed force. Therefore, it is important to explain the rationale of wartime law application to peace time evens, such as ASAT tests. The obligation to review new weapons, as was already mentioned, is not conditioned by the existence of an armed conflict. States are obliged to acquire legal evaluation of the weapon even if the weapon is not intended to be used in the future in the specific armed conflict. The experts drafting a legal review should answer the question if the use of the weapon during armed conflict, as it is at the current study, development, acquisition or adoption stage, would be legal. Therefore, Article 36 actually requires an expert drafting a review to apply IHL hypothetically. And if the expert concluded that the use of the currently developed (studied, acquired, adopted) weapon would breach the laws of war or other rules of international law, if these laws were applicable at the time, a state should change characteristics of the weapon and ask for another legal review which would be made in light of the changes. This iterative process should continue until a positive legal review is achieved. As has already been argued, the legal review should be made at the earliest possible stage of weapon development, which in most cases would be prior to weapon testing. And if in the earliest stage concluded that a planned-to-develop weapon would breach IHL, a state should not further develop and test that weapon. These arguments suggest that the requirement to hypothetically apply the laws of war in peace time have also legal weight to change the peacetime behaviour of states.

Legal weapon review obligation is constructed in the way that the weapons which would violate international law were prevented from ever be used. This requirement is not formal, but has significant practical weight.

It is difficult to calculate the amount and spread of space debris of a kinetic ASAT test, since the destruction of a satellite is an uncontrollable process. But the amount of debris may be estimated taking into account the size of and construction of the satellite, as well as the warhead and its destructive power. It is also possible to estimate the time that space debris will cycle the Earth, since this depends on the altitude of a satellite. It is evident that China's test was the least cautious from all ASAT tests conducted in this current century. It generated a cloud of debris thousands of kilometres wide that will take over a century to fall to Earth. It has already been reported that states had to manoeuvre their satellites out of harm's way.[1022] In 2009, three astronauts were forced to temporarily evacuate the International Space Station, seeking refuge in the attached Russian Soyuz spacecraft that serves as their emergency escape option, due to an unanticipated 'conjunction' with a wandering five-inch motor component.[1023]

1022 Weeden 2007, *supra* note 96.

1023 Koplow ASAT-isfaction, *supra* note 3, at 1206.

Having such a long-lasting and widespread damage to the natural environment, that test, if implemented in wartime, would most certainly breach IHL. If space debris hits other satellites whose malfunctioning causes damage to civilian population, then not only does it represent a breach Article 35(3), but also Article 55, which protects the population from the effects of warfare on the environment. This would be the case if the kinetic attack was implemented during armed conflict, however, we need to consider IHL peacetime obligations.

As kinetic-kill ASAT systems tend to create space debris, legal review should include an estimation of the number of debris a weapon could cause, and the time-cycle of debris in outer space. Even if in the "study" or "development" phase it was not known which satellite at which altitude will be attacked, legal review should include general estimations, recommending not to use the weapon in certain heights. As mentioned previously, legal reviews with estimations should be made before testing new weapons. If estimations calculate that the time span would be decades, then at least what a state should do before testing a weapon, is turning the testing process in ways that the side effects of the test were calculated in years, not decades. This is the expected state practice which would reflect the object and purpose of Article 36 obligations.

Here it is important to reiterate that the duty to review new weapons is linked with rules of armed conflict. This duty requires estimations of conditions when the use of the weapon during armed conflict would be legal or illegal. If these estimations indicated that the use of the weapon under certain circumstances, such as the targeting the high-altitude satellite, would most likely breach principle proportionality, then the mere testing of the weapon under the same conditions would breach not the targeting rules *per se,* but rather the requirements of duty to review new weapons which flow from or at least are linked with these targeting rules. Duty to legally review new weapons severs as the "corridor" for targeting rules to be applied in peacetime. And if these targeting rules indicate illegality of the new weapon, then under the procedural requirements of legal weapon review this new weapon should not be developed and tested further. It would be wrong and logically unexplainable to apply targeting rules for peacetime weapon testing and Author does not assert that it should. For example, the weapon testers, be it civilian or military personnel, should not make estimations whether the mere testing of the weapon would breach principle of proportionality. What they should look at is the legal review and whether it indicates weapon's illegality. If so, they should not test the weapon.

When drafting legal reviews for the testing of kinetic ASAT weapons special considerations are required, including taking into account such factors as the altitude of the satellite and long-term effects of a particular weapon. States are expected to modify the manufacture of a weapon to make them correspond with international law. Since legal reviews should be constantly rewritten, states should embark upon weapon testing procedures only after legal a review is positive.

Any weapon or means of warfare cannot be assessed in isolation from its intended method of warfare, and the same applies to ASAT weapons. If these weapons would be used to target higher orbit satellites, the damage done most probably would qualify

as 'long-term', and cause 'widespread' and 'severe' damage to the natural environment. Collateral damage such as this would hardly fit within the prohibition of indiscriminate attacks and principle of proportionality. But if an attack was carefully calculated to allow for space debris to re-enter the Earth's atmosphere sooner (rather than in decades), depending on other circumstances, such as size of satellite or missile, explosive power, direction from which the missile hits the target, that attack could potentially be legitimate in terms of IHL.

CONCLUSIONS

The results obtained in this research show that current *jus in bello* regime, including the rules of targeting, apply to military space operations. Although application of certain rules raises practical difficulties mostly due to the complex outer space environment, the analysis of the topic shows that all targeting rules apply to satellites as targets while some of them are even easier to implement in outer space than on land. Consequently, hypothesis of this thesis is confirmed by the following conclusions:

1. The potential conflict between IHL and ISL rules may be solved using *lex specialis derogat legi generali* technique. Rules related to the use of military force in outer space under ISL regime should be primarily applied as *lex specialis* or an exception from IHL regime. In all other cases where ISL does not regulate military conduct, IHL should prevail as a primary source of hostile state conduct in outer space. However, ISL continues to operate during armed conflict in outer space as long as it does not contradict IHL.
2. IHL is applicable to military space operations because Common Article 2 of 1949 Geneva Conventions does not limit their application geographically. Targeting rules apply to kinetic ASAT attacks. Non-kinetic ASAT activities are subjected to targeting rules as long as they disrupt military activities of the opponent and these activities may foreseeably neutralize, capture or damage opponent's military objective or pose threat to health or life of civilians or damage or destroy civilian objects.
3. A satellite which makes no contribution or its contribution to military action is vague or not evident is not a military objective because its destruction capture or neutralization would not offer a definite military advantage. The non-functional and non-repairable satellite, even having a primary military function (such as military reconnaissance satellites) would make no contribution to military action and, hence, would not constitute a military objective. Satellites which are hardly ever used by the military are not military objectives, because they make no effective contribution to military action.
4. Satellites owned by private companies are civilian objects, unless they constitute military objectives. War sustaining activities are not included in the definition of military objective and, therefore, do not form a ground to qualify an object as military objective. Consequently, taxes collected from space companies and allocated to the state military budget do not make assets of these companies (including satellites) military objectives, because military objectives are determined by military, not the financial value.
5. Satellites qualify for military objectives when they are owned by the military, used by the military or are planned to be used by the military in the future. Since the future use of a satellite is difficult to determine, states should evaluate intelligence or other data with due care and only implement an attack when such data is sufficient. If data is insufficient, more data should be acquired. A satellite cannot be targeted if it has merely potential to be used for military purposes in the future. The potential should be real and connote to probability or likelihood of its future military use.

Military status of a satellite does not make the whole constellation a military objective. Each target should individually qualify for military objective.

6. Satellites are targetable if their capture, destruction or neutralization offers a definite military advantage. The effects of a satellite attack and how these effects add to the military advantage need to be visible to the attacker, as the definition of military objective under IAP Article 52(2) requires the military advantage to be definite. The attacker is required to possess knowledge not only about general characteristics of a satellite, but also the probable consequences if a satellite is destroyed, neutralized, or captured.
7. Alternatively used satellites are military objectives from the moment they are used by the military. Since it is difficult to estimate the timing of signal flow and their end-users, a pattern of satellite's military use is important when qualifying satellites as military objectives. As long as the pattern of satellite use suggest that they are used for military purposes from time to time and that pattern shows the probability of their future use, they remain military objectives. However, such pattern of use should be proved by a reliable data. This makes all satellites alternatively used by the military and civilians military objectives by the criteria of purpose. On the other hand, when a civilian satellite does not have a pattern of military use (such as weather satellite) they are military objectives only as long as they are used by the military, unless there was reliable data on their future use.
8. Simultaneously used dual-use satellites are military objectives because they are constantly used for military purposes. A satellite having distinguishable military and civilian parts should not be treated as a single military objective, unless it is impossible to treat otherwise. The available means of targeting satellite parts, such as possession of ASAT lasers, should not determine the status of a part or the whole satellite. Unknown purpose satellites are civilian objects, unless pass a "two-pronged test" under IAP Article 52(2) making them military objectives. Satellites conducting rendezvous operations should be presumed to be civilian objects in accordance with IAP Article 52(3), unless they pose real threat to other assets, such as shadowing signals or coming so close that their purpose of military use rendering the military objectives becomes evident for a reasonable commander.
9. The frequency of satellite's military use should not *ipso facto* indicate its military status, otherwise such perception would risk the establishment of military objective presumption – contrary to what is required by IAP Article 52(3). Every satellite attack may only be waged if there is sufficient data allowing to qualify a specific satellite as a military objective. In the time frame, unless satellites are not military objectives by nature, they may shift the status back and forth dependently from their use, purpose, or location. Operative satellites owned by the military are military objectives by nature, their status does not shift.
10. Outer space is natural environment in sense of IHL targeting rules. Outer space constitutes the status of a civilian object and, firstly, in no way may directly be attacked, secondly, if military object in space is attacked, considerations of collateral damage to outer space need to be made. Space debris constitute damage to the

outer space. None of satellite attacks, even those targeting military satellites, may be implemented if they are likely to generate widespread, long-lasting space debris and thereby inflict severe damage to outer space.

11. Principle of unnecessary suffering is applicable to ASAT attacks as it may be inflicted as an indirect consequence of ASAT attack. Currently known ASAT technologies can hardly practically inflict unnecessary suffering because of the high threshold applied to causing unnecessary suffering.
12. Precautions in satellite attacks, as regulated by IAP Article 57, require verification, but not estimation of the status of a target. Verification does not require 100 percent accuracy in determining the status of a target, but rather due diligence and active duty to use all available means when collecting information.
13. Satellite attacks which do not strike difference between military objectives and civilian objects, such as the use of an extremely powerful explosive device to affect multiple satellites in the length of blast wave or using signal jamming technique which disturbs not only a signal of a target, but also other satellite signals in range, are indiscriminate and prohibited under IAP 51(4).
14. Principle of proportionality requires collateral damage to be estimated prior every satellite attack. The reverberating effects of attack should be assessed as long as they are foreseeable by a reasonable person. The foreseeability in that case does not only involve general knowledge and beliefs of the attack planner, but also the use of available means, such as advice of experts capable to project collateral damage. When reverberating effects of a kinetic satellite attack may not be reasonably foreseen, that does not mean that all unforeseeable effects are permissive, because when it is impossible to predict the precise effects of satellite attack, an attack may be considered indiscriminate and prohibited under IAP 51(4).
15. When assessing proportionality in attacks, causal nexus should be established between the planned ASAT activities of the attacker and potential collateral damage. Activities of the attacked state or a third state play no role in the assessment of collateral damage. Involvement of a third state or the lasting effect of collateral damage does not change proportionality assessment, neither mitigate the question of responsibility. A state planning to attack a satellite may not expect a third state to reduce collateral damage by, for example, repairing that satellite. Neither it can justify departure from collateral damage assessment if collateral damage may only be expected in a long-term.
16. The purpose of Article 36 of IAP is to prevent illegal weapons from being used in future armed conflicts. In that sense, the prudent implementation of this rule requires not only to conduct legal reviews of weapons at earliest stages of weapon development, including those prior to its testing, but also halt these procedures until a weapon is modified to correspond State's international obligations. Accordingly, the testing of kinetic ASAT weapons which, in the presence of armed conflict, could hardly correspond to *jus in bello* principle of proportionality, prohibition of indiscriminate attacks and environmental preservation rules, in most cases is incompatible with Article 36 of IAP requirements.

ASAT TARGETING RECCOMENDATIONS

1. It is recommended to treat ASAT activities as attacks when:
   1.1. It may be foreseen that the targeted satellite may face negative physical effects, such as destruction;
   1.2. It may be foreseen that the owner of a targeted satellite might lose control of a satellite as a consequence of ASAT activity;
   1.3. It may be foreseen that a satellite might face repairable damage which would neutralize it;
   1.4. A satellite is also used by civilians or civilian infrastructure, especially when the ASAT activity may be expected to cause injuries or deaths of civilians, damage or destruction of civilian objects.
2. To prevent the higher risk of proportionality breach, when available, use non-kinetic satellite targeting means which can achieve analogical military advantage as in case of kinetic satellite attacks.
3. To implement requirements of precautions in attacks, give unambiguous and effective advance warning prior to targeting satellites, especially GNSS or other constellations having been widely used by civilians, unless such warning impedes the achievement of military goals;
4. When analogical military advantage may be achieved by targeting satellite ground stations instead of satellites and the estimated collateral damage is not greater compared to satellite targeting, satellite ground stations should be opted for targeting to prevent the risk of breaching principles of military necessity and proportionality.
5. If a satellite may not be identified as a military object using all available information at the time, additional information should be collected. If additional information cannot be acquainted or may not suggest that a specific satellite has the probable status of military objective, a satellite should be presumed to be civilian object.
6. Whenever circumstances allow, it is suggestable to prudently opt time and place of a satellite attack. Attacking a satellite at night or over the area of less civilian signal recipients (such as high seas) might in some cases have less chances of disproportionate collateral damage.
7. The estimation of military advantage should follow these suggestions:
   7.1. In case of multiple attacks forming part of military operation the estimation of military advantage may combine single type of attacks if it is impossible to estimate military advantage of one single attack;
   7.2. If single type attacks involve targets with different threat levels on civilians and civilian objects, each attack posing threat to civilians or civilian objects should be estimated separately;
   7.3. Military advantage may be estimated only in cases when it is foreseeable;
   7.4. All attacks should be planned with concern of protecting civilians and civilian objects.

8. Satellite targeting planners should use all available means, including advice from engineers or other experts, to foresee and estimate the collateral damage as it is required by principle of proportionality.
9. An attacking party is recommended to consider the following factors before waging an ASAT attack:
    9.1. The altitude of the targeted satellite;
    9.2. Estimated amount of space debris;
    9.3. The space debris cloud potential orbital arrangement;
    9.4. The preliminary duration it would take for space debris to burn in the atmosphere;
    9.5. The density of satellites in the relative orbit;
    9.6. The relevance of satellite signals on civilian Earth technologies;
    9.7. The amount of injuries or deaths to civilians, damage or destruction of civilian objects which may be foreseen as a result of loss of targeted satellite signal.
10. It is not recommended to attack a satellite providing PNT data (GNSS satellites) having most risk of causing unexpectable, uncalculatable, and inestimable collateral effects, because prudent application of proportionality principle does not allow attacks when collateral damage is inestimable.
11. It is recommended to use a consequence-based approach when determining whether an ASAT activity should follow targeting rules. If the ASAT activity is likely to negatively affect civilians or civilian objects, such an activity should be scrutinized in terms of targeting rules;
12. When drafting legal reviews of ASAT weapons, states should consider whether the use of an ASAT weapon would generate space debris and, if it does, estimate the amount of it, the orbital spread and how long could they possibly last before re-entry.

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MYKOLAS ROMERIS UNIVERSITY

Tomas Marozas

SATELLITE TARGETING UNDER *JUS IN BELLO*

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Chair:
Prof. dr. Regina Valutytė (Mykolas Romeris University, Social Sciences, Law, S 001).

Members:
Doc. dr. Laurynas Biekša (Mykolas Romeris University, Social Sciences, Law, S 001);
Prof. dr. Tamás Lattmann (University of New York in Prague, Czech Republic, Social Sciences, Law, S 001);
Lekt. dr. Erika Leonaitė (Vilnius University, Social Sciences, Law, S 001);
Prof. dr. Dainius Žalimas (Vytautas Magnus University, Social Sciences, Law, S 001).

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Address: Ateities str. 20, LT-08303, Vilnius, Lithuania.

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Tomas Marozas

SATELLITE TARGETING UNDER *JUS IN BELLO*

SUMMARY

Research problem

It is claimed that outer space technologies have been developing too slowly. The former NASA astronauts lamented the United States lost ambition to concur outer space. Eugene Cernan, the last man to walk on the Moon, at the age of 75 said: "I really believed we'd be back to the Moon by the end of that decade and on our way to Mars by the end of the century...but my glass has been half-empty for the last three decades at least."[1024] Indeed, if we took a glance at main sectors of space applications identified by Organization for the Economic Co-operation and Development (hereinafter – OECD), we would see major technologies applied in those sectors are not new, but rather essentially updated.[1025] For instance, positioning, navigation and timing services (hereinafter – PNT) provided by Global Navigation Satellite System (hereinafter – GNSS) satellites which are commonly used by various present devices have been developed since 1970s.[1026] The development of reusable rockets, such as Falcon 9 of the SpaceX, is yet another example of essentially modified albeit decades-long intercontinental ballistic missile (hereinafter – ICBM) technology.[1027] These examples do not implicate in any way that the economy of space is static, it is rather not as rapid as was expected.

Although it may be questioned whether space technologies should have gone further by now, the unquestionable and undeniable truth about outer space is that it is being more and more congested. Compared to Cold War era space being an exclusive domain of the United States and the Soviet Union, the present actors include other major space-faring states, such as China, India, Iran, Israel, North Korea, Japan, United Kingdom, France and many other European Countries through consolidated platform of European Space Agency (hereinafter – ESA). Indeed, even relatively small

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1024 Jacqui Goddard, "Apollo astronauts lament America's lost ambition", New York Times, 2009, accessed, August 5, 2020, https://www.thetimes.co.uk/article/apollo-astronauts-lament-americas-lost-ambition-2q8h96fwx6p.

1025 For example, such as satellite communications (voice, data, Internet, and multimedia), broadcasting (TV and radio services, video services, Internet content), positioning, navigation and timing services and other services. OECD, "OECD Handbook on Measuring the Space Economy, 2nd Edition," OECD iLibrary, 2022, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

1026 NASA, "Global Positioning System History," NASA TV, 2012, https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html.

1027 See "1. THE RELEVANCE OF SATELLITES"; SpaceX, "Falcon 9 - First Orbital Class Rocket Capable of Reflight," accessed August 18, 2022, https://www.spacex.com/vehicles/falcon-9/.

countries having no space programs as Lithuania have their own satellites placed in orbit[1028] or business entities manufacturing satellites.[1029] Decentralization of space becomes more and more evident as space sector is no longer an exceptional domain of states. Private companies play an important role developing space launch capabilities – SpaceX, Virgin Galactic, Blue Origin, Boeing, Starchaser are only a few examples among other in this competitive sector. Throughout last decade alone, space sector has experienced structural changes – the lowered cost of access to space placed more emphasis on digital assets. Many space start-ups engage in both manufacturing and data exploitation.[1030] The rising demand and declining cost for high-quality space-based services have increased both, the number of systems launched into space and the number of subjects participating in space economy.[1031] The year of 2021 marked a record of 145 orbital launch attempts from 8 nations (compared to 84 launches in 2011), a record of the size of space industry reaching $ 423,8 billion (compared to $ 289,8 in 2011) a record of 1 730 payloads deployed in outer space (compared to 129 in 2011), even a record of 22 space tourists admiring the Earth from above (none of space tourists recorded in 2011).[1032] From 1957 to 2022 (August), a total amount of objects launched into space is 13 451,[1033] less than a third of it constitute operational satellites, almost 30 000 pieces of trackable debris (over 10 cm of size)[1034] and estimated 170 million pieces of untrackable debris.[1035] The plans of the upcoming decade fascinate and

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1028 "Lithuanian Satellite Launched to Space from India," Delfi.lt, accessed August 18, 2022, https://www.delfi.lt/en/business/lithuanian-satellite-launched-to-space-from-india.d?id=75027666.

1029 See UAB NanoAvionics, homepage: https://nanoavionics.com/.

1030 OECD, "OECD Handbook on Measuring the Space Economy, 2nd Edition," OECD iLibrary, 2022, 31, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

1031 National Air and Space Intelligence Center, "Competing in Space," 2018, https://media.defense.gov/2019/Jan/16/2002080386/-1/-1/1/190115-F-NV711-0002.PDF.

1032 Space Foundation, "2021 Annual Space Report" (Colorado Springs, 2021), 1, https://www.spacefoundation.org/wp-content/uploads/2022/04/SpaceFoundation_2021-Annual-Report_Final-1.pdf; Space Foundation, "Space Foundation's 2012 Report Reveals 12.2 Percent Global Space Industry Growth in 2011," https://www.spacefoundation.org/2012/04/05/space-foundations-2012-report-reveals-12-2-percent-global-space-industry-growth-in-2011/; Annual Number of Objects Launched into Space, Our World In Data, https://ourworldindata.org/grapher/yearly-number-of-objects-launched-into-outer-space?country=OWID_WRL~USA~RUS~CHN~GBR~JPN~FRA~IND~DEU~European+Space+Agency.

1033 United Nations Office for Outer Space Affairs, "Online Index of Objects Launched into Outer Space", https://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id=#?c=%7B%22filters%22:%5B%5D,%22sortings%22:%5B%7B%22fieldName%22:%22object.launch.dateOfLaunch_s1%22,%22dir%22:%22desc%22%7D%5D,%22match%22:null%7D.

1034 European Space Agency, "About Space Debris," accessed August 18, 2022, https://www.esa.int/Space_Safety/Space_Debris/About_space_debris.

1035 European Space Agency, "How Many Space Debris Objects Are Currently in Orbit?," accessed August 18, 2022, https://www.esa.int/Space_Safety/Clean_Space/How_many_space_debris_objects_are_currently_in_orbit.

frighten at the same time – SpaceX alone plan to launch 42 000 satellites to fully form Starlink constellation.[1036]

The growing number of objects placed into orbits raise both, environmental and security concerns. From environmental perspective, crowded with satellites orbits and post-launch space debris impede space accessibility. On the other hand, the growing number of governmental and non-governmental participants in outer space raise military concerns for major space superpowers. The recent United States Security Strategy calls the phenomenon of growing access to space a "democratization of space" and clearly indicates that it has negative impact on military operations of the United States and its ability to prevail in the conflict.[1037] Satellite services make an essential component of contemporary military operations – from military intelligence to weather forecast, from communication to smart missile targeting. It would not be wrong to claim that the technological dominance in outer space determines (at least partly) military dominance on land. Consequentially, recent decades have been marked with numerous kinetic anti-satellite (hereinafter – ASAT) weapon tests which have been criticized extensively for space debris creation and their threat to other satellites. In 2007, China successfully tested a kinetic ASAT device which was launched from the Earth. By no means the first of such kinetic ground-to-space tests it hastened a new form of "space race" by the superpowers. Indeed, in 2008, USA successfully destroyed one of its military intelligence satellites, in 2019 – India, and most recently, in 2021 – Russia. Merely these four kinetic ASAT weapons tests have increased a total number of space debris as calculated from 1957 by 25 percent.[1038] The rising number of space debris impedes access to space and peaceful exploration, pose threat to other space assets and threatens civilian commodities provided by satellites. As it is seen in further parts of this thesis, not only kinetic, but also non-kinetic weapons such as signal jamming technologies and directed energy weapons (hereinafter – DEWs, lasers) appear in the list of ASAT weapon tests. Not only they are tested, but in fact used to disturb peacetime military exercise activities of other countries, and even form an integral part of present ongoing armed conflicts. There is no doubt that the theoretical term "militarization of space"[1039] has gained significant practical weight.

The law regulating conduct in hostilities, international humanitarian law (hereinafter – IHL), also known as the law of armed conflict (hereinafter – LOAC), or *jus*

1036 Michele Yan Huang and Dave Mosher, "What Elon Musk's 42,000 Starlink Satellites Could Do for — and to — Planet Earth," Business Insider, 2021, https://www.businessinsider.com/how-elon-musk-42000-starlink-satellites-earth-effects-stars-2020-10.

1037 The White House, "National Security Strategy of the United States of America," 2017, 31, https://history.defense.gov/Portals/70/Documents/nss/NSS2017.pdf?ver=CnFwURrw09pJ0q5EogFpwg%3D%3D.

1038 European Space Agency, "About Space Debris."

1039 Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945-1984* (New York: Cornell University Press, 1985).

in bello[1040], especially the part which regulates targeting process, has not been volatile either. Since the adoption of Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977 (hereinafter – IAP) and 1977 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977 (hereinafter – IIAP) no major changes or new codifications appeared (except for single weapon ban treaties). Naturally, some hypothetical implications can be made ahead: modern IHL being almost half century old, is not modern anymore and additional regulation in form of international treaties is needed to avoid legal gaps and traps. However, these claims would be meaningless without prudent analysis of the *lex lata,* weighting the need for additional regulation and difficulties of achieving it in a universal multilateral international instrument level. The process of the drafting Tallinn Manual on the International Law Applicable to Cyber Operations (hereinafter – Tallinn Manual)[1041] serves as an example showing the strength of international law to adapt to new conduct through interpretation without additional regulation. Authors of Tallinn Manual contend that the hypothetical need for additional regulation may sometimes be satisfied by an "objective restatement of the *lex lata*."[1042] Other examples of specific combat area LOAC manuals[1043] show the tendency of this branch of international law to develop through interpretative techniques rather than new treaties often invoking additional fragmentation between other branches of international law.

In 2006, International Law Commission published a report on fragmentation of international law[1044] where it emphasized a problem of specialized law-making and institution-building tending to take place with relative ignorance of legislative and institutional activities in the adjoining fields and of the general principle and practices of

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1040 For the purpose of causing less confusion the Author uses IHL or *jus in bello* in context of identifying a branch of international law. However, LOAC being a term widely adopted in Commonwealth legal tradition, is used only when national military manuals restraining warfare conduct are discussed, since first ever manual as such appeared in the United States and other states, even those being part of continental legal tradition, pursued calling these legal guides mostly LOAC manuals rather than IHL manuals.

1041 Michael N. Schmitt, ed., *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017) (hereinafter - Tallinn Manual), 3.

1042 Tallinn Manual.

1043 San Remo Manual interpreting LOAC at sea, International Institute of Humanitarian Law, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, ed. Louise Doswald-Beck (Cambridge: Cambridge University Press, 1995) (hereinafter - San Remo Manual); Cambridge Manual interpreting LOAC in the air (Manual on International Law Applicable to Air and Missile Warfare (Program on Humanitarian Policy and Conflict Research at Harvard University, *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge, 2013).

1044 Study Group of the International Law Commission, "Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law," 2006, (hereinafter - ILC Fragmentation Report), https://doi.org/10.18356/ed47d916-en.

international law.[1045] The IHL and international space law (hereinafter – ISL) have developed separately from one another and, consequently, have been enclosed with rules which are not only incompatible, but have a potential of conflict with one another in the context of space warfare. For instance, the backbone of ISL – Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter – OST)[1046] – requires ultimate protection of astronauts and treats them as "envoys of mankind" while IHL permits wilful killing of combatants who are primarily members of state armed forces. In case an astronaut is a member of armed forces, should he or she be protected in outer space during an armed conflict or lawfully targeted? If such an astronaut is captured, should he or she be returned to representatives of the launching authority as required by ISL, or, contrary, captured as a prisoner of war as required by IHL? Another example of conflicting laws being significant to the process of targeting is related to the duty to cooperate between states. On the one hand, ISL requires a state to undertake appropriate international consultations with another state which may potentially face harmful interference by activities of the former state. If we placed this duty in the context of armed conflict, it may appear that the law requires any satellite attack to be implemented only after consulting a state owning that satellite. No matter how ridiculous these extrapolating examples may sound, the fact is that ISL and IHL are distinct branches having contrary requirements in different contexts as a result of fragmentation of international law. That leads to identification of the first problem of this research – there is legal uncertainty about application of conflicting rules of IHL and ISL. In other words, in certain circumstances related to the military operations against satellites it is not evident what is the required conduct by international law. This uncertainty complicates any further research regarding IHL targeting requirements because it might be the case that they are inapplicable in case of contradiction to ISL. Therefore, the question of ISL and IHL conflict resolution, substantiating all further research about satellite targeting, forms the legal basis of this thesis.

Targeting rules apply to a specific form of military operations – attacks. Albeit this notion is defined by law,[1047] it does not stipulate what form of violence constitute attacks. ASAT means include not only kinetic force weapons, but also non-kinetic, such as signal jamming or spoofing technologies. Therefore, some ASAT activities might be regulated by targeting rules – others not. States already possess and use non-kinetic ASAT weapons while the requirements of their use, especially application of targeting rules, are still unclear.

Targeting process requires prudent identification of a target. The current ISL legal framework requires each launching state to register objects launched into space and,

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1045 ILC Fragmentation Report, 10.

1046 Treaty on principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies, Oct. 10, 1967, 610 U.N.T.S. 205 (hereinafter – OST).

1047 1977 IAP, art. 49(1).

among other requirements, indicate their general function.[1048] Naturally, this requirement does not explicitly impose any obligation on states to identify their launched objects as either military objectives or civilian objects. It is hardly imaginable that any state would ever ratify a treaty requiring the disclosure of its military secrets or otherwise essentially undermining its security. IHL imposes duty to identify a potential target only upon the attacking party. And only those targets which constitute military objectives are allowed to be targeted.[1049] Identification of a satellite as a military objective is complicated due to satellite remoteness from Earth and the extreme environment of outer space. What complicates this process more, is that satellites sometimes simultaneously serve either military, either civilian or both devices. In one case a signal from a specific satellite may reach a receiver build in the military equipment, in another case – a civilian device, while in a third case – both devices in the down-link proximity of a satellite. This begs the answer to the question whether the status of a satellite depends from its signal recipient and what would be the status of dual-use satellites (used for military and civilian purposes at the same time). When and how exactly a satellite becomes targetable, or in other words, legally qualifies for military objective, is yet another legal issue that has not been solved.

Not only the status of satellites is uncertain but also the status of outer space itself. One of peculiarities of IHL is that besides general dichotomic classification of all objects into military objectives and civilian objects (granting protection only to the latter), it has specific rules armouring certain objects with *sui generis* protection. For instance, IHL identifies the need to protect natural environment from hazards of war and prohibits attacking it under certain conditions.[1050] Kinetic satellite attacks raise concerns about the amount of space debris generated by a collision between kinetic kill vehicle and a satellite. In this context, it may be questioned whether outer space constitutes natural environment in sense of IHL and, secondly, whether space debris constitutes damage to it as prohibited by specific rules of IAP. That leads to the third issue related to undefined IHL notion of the natural environment.

The process of targeting does not end with identification of a target. Many other estimations need to be made prior launching an attack. This includes taking certain precautionary measures to reduce collateral damage, including estimation and comparison of collateral damage with the military gain. This process, called proportionality assessment, is highly complicated, requiring comparison of incomparable values and outer space environment with satellite technology make it even more difficult. This is because the loss of a satellite signal may cause unpredictable consequences. The attack on a satellite could not only cause malfunction of a satellite itself, but also the

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1048 Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 1023 U.N.T.S. 15, Art. 4.

1049 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), Jun. 8, 1977, 1125 U.N.T.S. 3 (hereinafter – 1977 IAP), art. 52(2).

1050 1977 IAP, arts. 35(2) and 55.

malfunction of devices on Earth which eventually could end with civilian casualties or even deaths. The jammed signal of a satellite belonging to GNSS could not only mislead smart missiles, but also cause civilian aircrafts missing runways, crashing self-driving cars, loss of heating in winter, crashed stock exchanges, inoperative ATMs, floods from suddenly opened automated dams, overcrowded hospitals and much more. The case of SVN-23 error[1051] showed that these worst scenarios are not merely theoretical. From the legal point of view, the inability to predict collateral effects of the potential satellite attack complicates application of principle of proportionality as one essential part of it – estimation of potential collateral damage – is lacking. Bearing in mind the fact that IHL does not condition any derivation from this customary principle, its effectiveness may be questioned. On the one hand, the law may not require to do what is impossible,[1052] on the other, the law provides no exceptions to this rule. More to add, IHL does not explicitly define the collateral damage and, accordingly, to what extent the reverberating effects of the attack might stretch in the proportionality assessment process. Should the attacking party take into consideration only direct collateral effects of the attack, such as the loss of satellite signal, or should it include more causal steps, such as the likelihood of civilian casualties as a result of the lost signal? These ambiguities lead to the fourth problem – the obscure scope of law in regards to preparatory measures of satellite attacks.

Principle of distinction is one of the core principles of IHL. Generally, it requires parties to the conflict distinct from civilians and wage attacks only against military objectives. Besides its direct meaning, this principle has many derivatives, one of which is the prohibition of indiscriminate attacks.[1053] The use of means and methods of warfare which have uncontrollable effects and consequently strike civilian objects and military objectives without distinction is an example of indiscriminate attack. Taking into consideration kinetic satellite attacks causing multiple pieces of space debris floating in orbits in uncontrollable ways and threatening other space assets, the question may be raised whether these attacks are indiscriminate and prohibitive *per se*. On the other hand, the rule prohibiting indiscriminate attacks does not indicate whether only direct effects of the used mean need to be considered. For instance, it might be said as well that a kinetic ASAT weapon targeting a satellite does have controllable effects – its kinetic kill vehicle uses sensors to reach the target and strike with ultimate precision. Therefore, the primary effect of the weapon – capability to strike with precision – does not violate requirements for target discrimination. This being said, another question related to the principle of distinction and its application may be raised – do ASAT activities comply with IHL's requirement to discriminate targets?

1051 Discussed in "3.8.4.2. Assessment of Collateral damage".

1052 Emanual Kant argued that the Latin maxim *ultra posse nemo obligatur* (no one may be obliged to do what is impossible) is the general norm for free actions. Gottfried Achenwall, *Natural Law: A Translation of the Textbook for Kant's Lectures on Legal and Political Philosophy*, ed. Pauline Kleingeld (London: Bloomsbery Publishing Plc, 2020).8

1053 1977 IAP, art. 51(4).

Although IHL is mostly applicable only during armed conflicts, some notions are designed to be applied in peace-time as well. One of such examples is the requirement for the states to make legal reviews of weapons which they study, develop, acquire, or adopt. In other words, any state willing to "modernise" military equipment should not only study technical parameters of a weapon but also make legal considerations whether the use of a new weapon during an armed conflict would be in line with IHL.[1054] It should be borne in mind that there is no mechanism under international law requiring accountability or revision of conducting legal reviews of weapons, therefore, it is impossible to check whether this duty is in fact obeyed. Supposedly states follow it and make a review of a new weapon, supposedly a person drafting a review is objective, uninfluenced by politicians or military superiors and concludes that the developed weapon, if used under circumstances of the armed conflict, would contradict state's international obligations. What measures should the state then take? Should it stop weapon development, change weapon characteristics to comply with the law, or may it pursue developing new weapon as planned? IAP does not provide any answers to these questions and this makes the last issue to be solved by this thesis – disclosure of obligations relative to legal weapon reviews and in this context, assessment of peacetime kinetic ASAT tests. Having in mind the negative space debris outcome of kinetic ASAT tests and considerations of banning such practice,[1055] the analysis of this topic could either stimulate further ban discussions or be a source for lawyers conducting legal reviews the least.

The relevance of the problem

As outer space becomes more and more congested and militarized,[1056] identification of legal boundaries of such conduct is of crucial importance at global level. In 2020, United Nations (hereinafter – UN) General Assembly (hereinafter – UNGA) passed a resolution urging Member States to study existing and potential threats to space systems and "<…> share their ideas on the further development and implementation of norms, rules and principles of responsible behaviors and on the reduction of the risks of misunderstanding and miscalculations with respect to outer space."[1057] Most of the states unanimously identified ASAT technologies deviating space security. Even China – the author of most notorious kinetic ASAT test to date – admitted that

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1054 1977 IAP, art. 36.

1055 Daryl G. Kimball, "U.S. Commits to ASAT Ban," Arms Control, 2022, https://www.armscontrol.org/act/2022-05/news/us-commits-asat-ban; Jeff Foust, "Canada Joins U.S. in ASAT Testing Ban," Space News, 2022, https://spacenews.com/canada-joins-u-s-in-asat-testing-ban/; Spacewatch, "Russia's Roscosmos To Initiate Talks On Kinetic Kill ASAT Ban," Spacewatch Global, 2019, https://spacewatch.global/2019/12/russias-roscosmos-to-initiate-talks-on-kinetic-kill-asat-ban/; Talia M. Blatt, "Anti-Satellite Weapons and the Emerging Space Arms Race," Harvard International Review, 2020, https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/.

1056 See Joan Johnson-Freese, *Space warfare in the 21st century : arming the heavens* (New York: Routledge, 2017), 26-55.

1057 GA Res 75(36), UNGAOR, UN Doc A/RES/75/36 (2020), 3/3, para. 5.

space weaponization prevention is fundamental for maintaining space security.[1058] The global concern of current space security situation makes this thesis not only generally relevant, but also research results potentially practically significant.

The modern laws of war have been in force since 1977. These laws have been primarily written for land, sea and (in small part) air warfare. None of them directly connote to outer space. As it has been already indicated, many rules of IHL are broadly formulated and thus leave their application uncertain. However, this is not necessarily a drawback. The general nature of IHL rules paves a convenient way for interpretation of the law. IHL might be capable to adapt to technological innovations used by militaries and there might be no need to propose additional regulation. The answer to this question, if found, could give a push to further development of IHL.

The relevance of outer space for global services, the military significance of satellites and evolving state practice in satellite targeting makes the topic highly relevant, especially knowing the fact that there are no scripted rules of satellite targeting, as well as authoritative studies commenting it. The problems raised in previous field only show ambiguities and uncertainty in law regarding military conduct in outer space. These ambiguities have relatively rarely been discussed, not to mention the lack of answers or suggestions.

Satellites floating silently and peacefully in outer space often sustain loud and destructive activities on Earth. They are attractive targets because their trajectories are calculable, they have least chances to escape missile blasts which generate extreme amounts of kinetic energy due to high velocities in space. While the law of satellite targeting is discussive and not comprehensively explained, satellite targeting may seem unlimited. That perception may lead to devastating effects of satellite signal loss resulting in realization of Kessler's syndrome[1059] in outer space and destruction, injuries and deaths on Earth. This is another reason showing a high demand of IHL interpretation in outer space field. Although debates on certain aspects provided in Tallinn Manual are still ongoing (the Author shares some criticism in this thesis), Author shares the view that the research made by the international expert group in drafting Tallinn Manual is a success story providing comprehensive interpretation of LOAC in cyber field. In field of military use of space, at least two expert groups are currently drafting (finalizing) manuals. One project examines international law applicable to military uses of outer space (called the Milamos project or McGill manual),[1060] while the other concerns international law applicable to military space activities and operations

1058 Document of the People's Republic of China pursuant to UNGA Resolution 75/36 (2020), https://front.un-arm.org/wp-content/uploads/2021/05/Chinas-Position-on-Outer-Space-SecurityEnglish.pdf.

1059 See Mike Wall, "Kessler Syndrome and the Space Debris Problem," Space.com2, 2021, https://www.space.com/kessler-syndrome-space-debris.

1060 McGill University, "The McGill Manual on International Law Applicable to Military Uses of Outer Space," accessed August 18, 2022, https://www.mcgill.ca/milamos/.

(called The Woomera Manual).[1061] Put it more simply, McGill manual covers a variety of international law subject matters applicable for peacetime events (including tensions that pose challenges to peace), while Woomera Manual focuses on international law applicable to armed conflicts and military space operations. Only McGill Manual has been published and only its first part listing rules (without commentary).[1062] These initiatives surrounded by major experts in the field show how great the demand for the legal explication of military space activities is. The experts drafting McGill Manual portray their mission of *lex lata* interpretation as a way "to ensure that outer space remains free from conflict and is explored and used in a safe, secure and sustainable manner, in accordance with the international rules-based order."[1063] Indeed, the vision of McGill Manual authors' to ever prevent armed conflict in space is scenic and idealistic. However, we should not take the wishful peaceful use of outer space for granted – state practice has gone the other way long ago and could hardly ever demilitarize, renounce precision missiles, intelligence, or encrypted communication. These reasons show that the topic of satellite targeting is currently relevant and will stay so in the future.

Review of the relevant sources

The topic of space warfare is neither new nor outdated. It is complex, interdisciplinary, requiring not only legal knowledge but also general understanding of physics, satellite engineering and politics. Therefore, multiple sources from other than international law disciplines have been used extensively. The notable books on space warfare policy include those written by John J. Klein,[1064] Joan Johnson-Freese,[1065] David Pahl,[1066] M. N. Sirohi.[1067] ASAT engineering and weapon technology are important topics without which certain legal conclusions may not be drawn. Joseph A. Jr. Angelo astonishingly clrearly provided essential characteristics of space weapons,[1068] Pat Norris explained the operations of space intelligence,[1069] Jacob G. Oakley appraised the

1061 The University of Adelaide, "The Woomera Manual," accessed August 18, 2022, https://law.adelaide.edu.au/woomera/.

1062 Bearing in mind the object of this thesis, only Woomera Manual is relevant, because McGill manual does not directly solve questions of *jus in bello*, especially those related to satellite targeting.

1063 Ram S. Jakhu & Steven Freeland, eds, McGill Manual on International Law Applicable to Military Uses of Outer Space: Volume I - Rules (Montreal: Centre for Research in Air and Space Law, 2022), 1.

1064 John J. Klein, *Space Warfare: Strategy, Principles and Policy* (New York: Routledge, 2006).

1065 Joan Johnson-Freese, *Space Warfare in the 21st Century: Arming the Heavens* (New York: Routledge, 2017).

1066 David Pahl, *Space Warfare and Strategic Defense* (London: Bison Books, 1987).

1067 M. N. Sirohi, *Military Space Force and Modern Defense* (New Delhi: Alpha Editions, 2016).

1068 Joseph A. Jr. Angelo, *Frontiers in Space: Satellites* (New York: Infobase Publishing, 2006);

1069 Pat Norris, *Spies in the Sky: Surveillance Satellites in War and Peace*, *Strategic Analysis*, 1983.

relevance of cyber attacks to space military operations.[1070] These are only a few non-legal books which significantly helped exploring reality surrounded by outer space. Unfortunatelly, same may not be said about books analysing space warfare through the spectrum of international law. The Author found no specifically dedicated international law books about military space operations. Major reasearch is found in relatively short chapters of publications discussing general impact of new technologies to IHL or specifically addresses issues in periodical journals. Authors were relatively active in analysing IHL's applicability in outer space. Kubo Mačak provided a fruitful analysis on this topic confuting the doubts of sceptics and identified major rules of IHL and ISL which are in tention.[1071] Franz von der Dunk[1072] and Dale Stephens[1073] proposed ISL and IHL conflict resolution models. William H. Boothby, analysed the topic of satellite targeting in few chapters of his books and identified major issues related to application of IHL.[1074] Melissa de Zwart who was one of the authors of William H. Boothby's edited book, presented the issues related to applicability of rules to military conflict in outer space, focused on *jus ad bellum* regulation.[1075] Duncan Blake whom the Author had the chance to interview in person, is also one of the most visible legal commentators in the field. His research is related with military strategic use of outer space[1076] and the law applicable to military strategic use of outer space.[1077] Although relatively briefly, he also general *jus in bello* issues related to military activities in outer space. Jackson Maogoto analysed the topic in field of *jus ad bellum*.[1078] Bill Boothby presented analysis from space weapons perspective and focused reasarch on mostly two principles of targeting – indiscriminate attacks and superfluous injuries. Bill Boothby was one of the few to analyse the quesiton of ASAT weapon reviews (along with Kubo

1070 Jacob G. Oakley, *Cybersecurity for Space: Protecting the Final Frontier* (Owens Cross Roads: Apress, 2020).

1071 Kubo Macak, "Silent War: Applicability of the Jus in Bello to Military Space Operations," *International Law Studies* 94 (2018): 39.

1072 Frans G. von der Dunk, "Armed Conflicts in Outer Space: Which Law Applies?," *International Law Studies* 97 (2021): 188–231.

1073 Dale Stephens, "International Legal Implications of Military Space Operations", 94 *International Law Studies* 75 (2018),

1074 William H. Boothby, *The Law of Targeting* (Oxford: Oxford University Press, 2012), 359-377; William H. Boothby, *New Technologies and the Law in War and Peace* (New York: Cambridge University Press, 2019).

1075 Melissa de Zwart, "Outer Space", in *New Technologies and the Law in War and Peace*, ed. William H. Boothby (Cambridge: Cambridge University Press, 2019): 337-358.

1076 Duncan Blake, "Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 97–114.

1077 Duncan Blake, "The Law Applicable to Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 115–140.

1078 Jackson Nyamuya Maogoto, *Technology and the Law on the Use of Force : New Security Challenges in the Twenty First Century* (New York: Routledge, n.d.), 31-53

Mačak).[1079] Michael N. Schmitt systemically, although relatively briefly, contemplated on general IHL issues in outer space, such as when would satellites constitute military objectives, which ASAT activities constitute attacks and what legal implications flow from customary IHL principles.[1080] Already mentioned Dale Stephens with co-author Cassandra Steer in their article elaborated questions of dual-use satellites, reverberating effects of attacks and did emphasize important unsolved issues, such as reverberating effects of satellite attacks. Koplow analyzed ASAT activities through the spectrum of customary international law.[1081] Robert A. Ramey deserves exclusive mentioning. In 2000, he wrote one the first, most detailed and comprehensive articles in the field discussing types of ASAT weapons and IHL's application to outer space. He was one of the first to address the issue ISL and IHL relationship and identify specific conflicting rules. His work has been extensively quoted by other publicists.[1082] Many other known experts of LOAC, to name only a few – Leslie C. Green,[1083] Yoram Dinstein,[1084] Gary D. Solis,[1085] have influenced this work. No related research has ever been made by Lithuanian scholars.

Important remarks need to be given about normative sources as well. The major source of *lex lata* identification is IAP which accumulated and updated relevant provisions of the 1899 and 1907 Hague treaties known to be primary sources of law regulating means and methods of warfare. Despite multiple other sources regulating means and methods of warfare, IAP is used as a primary source of targeting rules because:

1. It was the first document to codify or crystalize certain important targeting rules, such as principle of proportionality;
2. Despite many adopted treaties in the turn of the nineteenth and twentieth centuries (such as 1899 and 1907 Hague Conventions) none of them were so widely ratified as the IAP. It still stands as the most detailed codification of the targeting rules;
3. Hague conventions of 1899 and 1907 share relatively general terminology compared to detailed provisions of IAP;
4. 1899 and 1907 Hague conventions are narrower, addressing only few important targeting rules compared to IAP;

1079 Bill Boothby, "Space Weapons and the Law," *International Law Studies* 93 (2017): 179–214.

1080 Michael Schmitt, "International Law and Military Operations in Space," *Max Planck Yearbook of United Nations Law* 10 (2006): 89–125, https://doi.org/10.1163/138946306783559959.

1081 David Koplow, "ASAT-Isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons," *Michigan Journal of International Law* 30 (2008): 1187; Boothby, "Space Weapons and the Law."

1082 Robert A. Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space," *The Air Force Law Review* 48, no. 1 (2000): 157.

1083 Leslie C. Green, *The Contemporary Law of Armed Conflict*, 2nd Ed. (Manchester: Manchester University Press, 2000).

1084 Yoram Dinstein and Arne Willy Dahl, *Oslo Manual on Select Topics of the Law of Armed Conflict. Rules and Commentary* (Tel Aviv: Springer Open, 2020).

1085 Gary D. Solis, *The Law of Armed Conflict. International Humanitarian Law in War* (Cambridge: Cambridge University Press, 2010).

5. During the 1974 CDDH on the adoption of IAP, OST and other important sources of ISL were already in force giving practical ground to discuss space warfare. 1899 and 1907 Hague treaties were drafted long before the beginning of space age and rudiments of space warfare;
6. Many targeting rules have been acclaimed to attain customary status only after Nuremberg trials. Therefore, the analysis of the Hague treaties would be geographically limited, as only minor number of States were parties to those instruments. This would lead to less practical research results.

Concerning customary IHL, this thesis does not aim neither to search and identify customary IHL, nor question it. As state practice is emerging in field of space warfare, in most instances, we can hardly claim the customary status of a certain rule. The most detailed to date study on customary IHL has been made by ICRC (hereinafter – ICRC Customary IHL study)[1086] and rules identified in that study as customary are presumed to be so. Additionally, the work of David Koplow having analyzed the question of customary law in context of ASAT activities is used were necessary.

It should also be argued why sources regulating hostilities of not of international character are less relevant in context of the object of this thesis. IHL regulates two types of armed conflicts – international armed conflicts fought (mostly) by states and non-international armed conflicts where at least one party to the conflict is an organized non-state armed group. Because of state's willingness to have their own national legal tools to curb criminal-like, revolutionary or otherwise disobedient paramilitary movements within their territory, the scripted international law in this field remained relatively narrow. Moreover, the threshold of IHL's application for non-international armed conflicts (discussed shortly in "1.4. The threshold of non-international armed conflict") is much higher than the one applied for international armed conflicts. That leaves non-international armed conflict in space less possible and less relevant, even though non-state actors already take active part in space activities. Lastly, even though the scope of written IHL for non-international and international armed conflicts differ, it is generally claimed that major targeting rules (military necessity, precautions in attacks, proportionality, distinction, prohibition of indiscriminate attacks) have attained customary status and are equally applied in non-international armed conflicts.[1087] Therefore, the rapprochement of both IHL's regimes would not add much of scientific value, make the analysis less relevant and even more repetitive. Despite this, essential characteristics, and differences between international and non-international armed conflict IHL regimes are explained for the purposes of a more comprehensive and understandable analysis.

1086 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.* (Cambridge: Cambridge University Press, 2005) and Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary Interantional Humanitarian Law. Volume II: Practice* (Cambridge: Cambridge University Press, 2005).

1087 The ICRC Customary IHL study indicates that most rules are applied to non-international armed conflicts.

Novelty of the research

Despite the great work of many notable authors mentioned previously, the Author lacked deeper approach on many questions surrounding current state practice related to ASAT activities. To begin with, current research aiming to solve ISL and IHL potential normative conflicts does not propose tactically practical solutions for targeting decision makers. On the one hand, in Author's view, scholars who researched that problem did not identify all potential normative conflicts, but rather focused on most evident ones (such as astronaut-combatant status conflict). Without seeing a full picture of potential normative conflicts, it is rather hard check whether a proposed conflict resolution mechanism fits all scenarios. Moreover, although scrupulously constructed, thoughtful and reasonable, some of the proposed models have space for interpretation and can hardly be applied at operational level where strict and objective knowledge of *lex lata* is preferred to obscure and interpretative notions. The Author identifies all visible normative tensions between ISL and IHL and proposes a resolution mechanism which can easily be applied in practice at any operational level. The model is novel and it makes thesis practically significant.

A rather intense scientific debate takes place between military and humanitarian protagonists on the legal treatment of soft-military means and whether they constitute attacks. Indeed, this question has gone into arena of scientific journals in the form of "reply to critics" and still has not been agreed on. The Author proposes a novel look at the notion of "attacks" under IHL and how it should apply to non-kinetic ASAT activities.

Although the status of dual-use satellites has been periodically contemplated, most authors suggested to treat those satellites as military objectives by their military "use". However, this topic is not as narrow as it seems. For instance, it is questionable whether a satellite once used by the military retains the status of military objective indefinitely, or whether a specific part of a satellite making it a military objective (e.g. infrared sensor) can make the whole satellite military objective, or whether an alternatively used satellite constitutes a military objective. Many topics the Author discuss have not been publicly discussed elsewhere – the status of alternatively or simultaneously used satellites, status of unknown-purpose satellites, status of satellite parts, status of outer space, including the status of orbits are only few examples.

The causal stretch of reverberating effects of satellite attacks, especially kinetic ones, is yet another difficult question showing novelty of this thesis. Authors emphasized the need to apply principle of proportionality in regards to attacks, however, none of them contemplated how exactly should the collateral damage of satellite attacks be measured and how far reverberating effects of attacks should be predicted in proportionality assessment.

A novel approach on legal weapon review duty is provided as well. Despite the rather broad formulation of this duty requiring the states to only make legal reviews of new weapons, the Author raises a novel question whether this duty extends to peacetime weapon testing and whether kinetic ASAT weapon testing is in line with it.

What also makes this research novel, is that the analysis of satellite targeting – a

relatively narrow topic – is provided in one comprehensive piece of research combing views of publicists, state practice and relative jurisprudence of international courts.

Practical significance of the research

The Author shares the view that persuasive treaty interpretation may complement the absence of international binding rules and even influence decision makers who form state practice which eventually may one day root into an internationally binding custom. The results of dissertation may serve in the following ways:

1. Military lawyers, legal advisors and other officials may use research results when giving advice to targeting decision makers or drafting legal weapon reviews;
2. The results of dissertation may be a source for drafting national LOAC manuals or updating them;
3. The results of dissertation may give impetus for discussion among lawyers of international law, including those drafting Woomera manual;
4. The results of dissertation may be in use for teachers of IHL drafting study programmes and making practical tasks for students.

The purpose, objectives and hypothesis of the thesis

The object of the thesis – Application of IHL targeting rules to ASAT activities.

The purpose of this thesis is to analyse how *jus in bello* targeting rules apply to ASAT activities, identify legal issues that float from ASAT activities and propose their solution mechanisms. For that purpose, the thesis sets the following objectives:

1. Define the interplay between IHL and ISL and propose a resolution mechanism of potential normative conflicts;
2. Explain when satellites legally qualify for military objectives;
3. Analyse the status of outer space under IHL and what legal implications flow from it;
4. Examine whether kinetic ASAT attacks constitute indiscriminate attacks;
5. Scrutinize how principle of proportionality applies to ASAT activities and to what extent reverberating effects of satellite attacks constitute collateral damage;
6. Analyse whether duty to review new ASAT weapons legally restricts kinetic ASAT tests in peacetime.

The hypothesis of the thesis: *Lex lata* of IHL is sufficient to regulate satellite targeting.

The methodology

The topic appertains to the relative field of social sciences, therefore the characteristic methods to this branch of science used in thesis are the following: analogy, comparative analysis, document analysis, historical, linguistic, and systemic analysis.

Analogy. IHL rules have often been portrayed as *lex specialis* in relation to other branches of public international law, namely, international human rights law (hereinafter – IHRL). The debate and arguments used by courts and publicists on IHL and IHRL relationship serve as the basis for the search of IHL and ISL interplay. The

Author seeks to transpose criticism expressed in IHL and IHRL relationship debate and check if *lex specialis* normative resolution technique can still be applicable in case of IHL and ISL potential conflicts.

Comparative analysis method serves as a tool to evaluate different positions of publicists and *opinio juris* of states. For instance, an ongoing debate about the definition of attack sparked in the Tallinn Manual provoked many debates not only among researchers and even organizations. The arguments used by them are compared and placed into the context of space warfare. In another way, this method helps to identify *opinio juris* when analyzing national military manuals and comparing views of states, such as how states treat dual-use objects and how they portray collateral damage in the assessment of attack proportionality.

Document analysis is applied in various contexts throughout thesis, from evolution of ASAT weapons to the genesis of customary targeting principles. This method is useful to construct arguments explaining the meaning of certain rules. For instance, *travaux préparatoires* of the 1974-1977 Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law applicable in Armed Conflicts (hereinafter – CDDH) is used to disclose the intent of drafters and explain the meaning and scope of relevant IAP rules, such as duty to review new weapons or IAP applicability in the environment of outer space.

Teleological method. The official records of the CDDH are in hand to disclose the intent of the drafters and explain the meaning and purpose of specific rules. For instance, while analyzing the question of IHL's applicability in different environments, the Author searched whether delegations who participated in CDDH had views or made comments on outer space as a potential field of future combat and whether rules of IAP are subjected to this form of warfare. Moreover, this method helped to disclose the rather general formulation of IAP Article 36 requiring the states to conduct legal weapon reviews.

Linguistic method is used to explain the common understanding of terms otherwise not described in specific rules, including those drafted by national legislators. For instance, the analysis of United States position on the definition of military objective, more specifically, the difference between legal notions of "destruction" and "neutralization", required the search of their meaning in official military dictionaries. In another context, linguistic method was used to contemplate on the question whether outer space can be considered as natural environment under *jus in bello* regime. Moreover, this method helped to disclose the meaning of "expected collateral damage" or which activities should be considered as "indiscriminate".

Systemic analysis is one of the major methods use in this thesis. ASAT activities are not specifically regulated by scripted sources of IHL. This gap invokes many legal issues related to current actual conduct and hypothetical conduct expected to happen in the future. Major chapters include analysis of legal texts, jurisprudence, *opinio juris*, state practice and opinions of publicists. These sources of international law often appear to contradict each other making conclusions relatively hard to be instantly drawn. A systemic analysis approach helps to identify a connecting theme of these differences

and provide reasonable conclusions. As an example, while searching for IHL and ISL potential normative conflict resolution mechanisms, the Author had not only to analyse and opt most relative conflict resolution mechanisms, but also analyse how these methods have been applied in jurisprudence, how their application changed, what were the reasons for it, how it was portrayed by publicists and what arguments they made and whether those arguments stand in context of IHL and ISL interplay. In other case, being one of the core principles of IHL, military necessity is not defined by law, although in few instances mentioned. If only legal texts were taken as a source to disclose the meaning of this principle, it would be most probably misunderstood as being an exception from a specific rule. Therefore, in order to understand this and other IHL targeting principles, it is necessary to analyse their origins, *opinio juris*, opinions of scholars and how in practice they are applied by international courts. And only after disclosure of their meaning, they might be brought to the context of ASAT activities. Therefore, the disclosure of the meaning of most legal terms contemplated in this thesis require systemic approach as it is often the case that the meaning of a legal notion is not fully disclosed in one legal source.

Historical method. As already indicated, the use of this method helped to disclose the meaning of IHL targeting principles, most of which changed throughout adoption of new legal instruments. For instance, historical analysis method allowed to disclose the fact principle of distinction evolved as a principle protecting persons, not objects, and only after 1977 with the adoption of IAP, objects without military value attained the protective status of civilian object.

Structure of the thesis

The topic is divided into four segments constituting separate chapters.

The first chapter analyses IHL's applicability in outer space and the interplay between IHL and ISL. This analysis is necessary as some rules of ISL have a potential of conflict with IHL's rules and *vice versa*. Without such analysis, many further contemplated legal issues would only be hypothetical, lacking practical significance.

The second chapter seeks to disclose the circumstances under which a satellite is treated either as military objective or civilian object, as well as the status of outer space which could have effect on the status of satellite. This chapter is called targetability of satellites seeking to emphasize the initial targeting stage – target identification – and distinguish it from targeting principles.

The third chapter scrutinizes general principles of targeting: military necessity, precautions, distinction, unnecessary suffering and proportionality. These topics are presented not only from current legal perspective, but also historical for the purpose of understanding and applying these principles correctly.

The fourth chapter analyses obligation of states to review new ASAT weapons and how it restricts states' peacetime preparatory ASAT conduct.

CONCLUSIONS

The results obtained in this research show that current *jus in bello* regime, including the rules of targeting, apply to military space operations. Although application of certain rules raises practical difficulties mostly due to the complex outer space environment, the analysis of the topic shows that all targeting rules apply to satellites as targets while some of them are even easier to implement in outer space than on land. Consequently, hypothesis of this thesis is confirmed by the following conclusions:

1. The potential conflict between IHL and ISL rules may be solved using *lex specialis derogat legi generali* technique. Rules related to the use of military force in outer space under ISL regime should be primarily applied as *lex specialis* or an exception from IHL regime. In all other cases where ISL does not regulate military conduct, IHL should prevail as a primary source of hostile state conduct in outer space. However, ISL continues to operate during armed conflict in outer space as long as it does not contradict IHL.
2. IHL is applicable to military space operations because Common Article 2 of 1949 Geneva Conventions does not limit their application geographically. Targeting rules apply to kinetic ASAT attacks. Non-kinetic ASAT activities are subjected to targeting rules as long as they disrupt military activities of the opponent and these activities may foreseeably neutralize, capture or damage opponent's military objective or pose threat to health or life of civilians or damage or destroy civilian objects.
3. A satellite which makes no contribution or its contribution to military action is vague or not evident is not a military objective because its destruction capture or neutralization would not offer a definite military advantage. The non-functional and non-repairable satellite, even having a primary military function (such as military reconnaissance satellites) would make no contribution to military action and, hence, would not constitute a military objective. Satellites which are hardly ever used by the military are not military objectives, because they make no effective contribution to military action.
4. Satellites owned by private companies are civilian objects, unless they constitute military objectives. War sustaining activities are not included in the definition of military objective and, therefore, do not form a ground to qualify an object as military objective. Consequently, taxes collected from space companies and allocated to the state military budget do not make assets of these companies (including satellites) military objectives, because military objectives are determined by military, not the financial value.
5. Satellites qualify for military objectives when they are owned by the military, used by the military or are planned to be used by the military in the future. Since the future use of a satellite is difficult to determine, states should evaluate intelligence or other data with due care and only implement an attack when such data is sufficient. If data is insufficient, more data should be acquired. A satellite cannot be targeted if it has merely potential to be used for military purposes in the future. The potential should be real and connote to probability or likelihood of its future military use.

Military status of a satellite does not make the whole constellation a military objective. Each target should individually qualify for military objective.

6. Satellites are targetable if their capture, destruction or neutralization offers a definite military advantage. The effects of a satellite attack and how these effects add to the military advantage need to be visible to the attacker, as the definition of military objective under IAP Article 52(2) requires the military advantage to be definite. The attacker is required to possess knowledge not only about general characteristics of a satellite, but also the probable consequences if a satellite is destroyed, neutralized, or captured.
7. Alternatively used satellites are military objectives from the moment they are used by the military. Since it is difficult to estimate the timing of signal flow and their end-users, a pattern of satellite's military use is important when qualifying satellites as military objectives. As long as the pattern of satellite use suggest that they are used for military purposes from time to time and that pattern shows the probability of their future use, they remain military objectives. However, such pattern of use should be proved by a reliable data. This makes all satellites alternatively used by the military and civilians military objectives by the criteria of purpose. On the other hand, when a civilian satellite does not have a pattern of military use (such as weather satellite) they are military objectives only as long as they are used by the military, unless there was reliable data on their future use.
8. Simultaneously used dual-use satellites are military objectives because they are constantly used for military purposes. A satellite having distinguishable military and civilian parts should not be treated as a single military objective, unless it is impossible to treat otherwise. The available means of targeting satellite parts, such as possession of ASAT lasers, should not determine the status of a part or the whole satellite. Unknown purpose satellites are civilian objects, unless pass a "two-pronged test" under IAP Article 52(2) making them military objectives. Satellites conducting rendezvous operations should be presumed to be civilian objects in accordance with IAP Article 52(3), unless they pose real threat to other assets, such as shadowing signals or coming so close that their purpose of military use rendering the military objectives becomes evident for a reasonable commander.
9. The frequency of satellite's military use should not *ipso facto* indicate its military status, otherwise such perception would risk the establishment of military objective presumption – contrary to what is required by IAP Article 52(3). Every satellite attack may only be waged if there is sufficient data allowing to qualify a specific satellite as a military objective. In the time frame, unless satellites are not military objectives by nature, they may shift the status back and forth dependently from their use, purpose, or location. Operative satellites owned by the military are military objectives by nature, their status does not shift.
10. Outer space is natural environment in sense of IHL targeting rules. Outer space constitutes the status of a civilian object and, firstly, in no way may directly be attacked, secondly, if military object in space is attacked, considerations of collateral damage to outer space need to be made. Space debris constitute damage to the

outer space. None of satellite attacks, even those targeting military satellites, may be implemented if they are likely to generate widespread, long-lasting space debris and thereby inflict severe damage to outer space.

11. Principle of unnecessary suffering is applicable to ASAT attacks as it may be inflicted as an indirect consequence of ASAT attack. Currently known ASAT technologies can hardly practically inflict unnecessary suffering because of the high threshold applied to causing unnecessary suffering.
12. Precautions in satellite attacks, as regulated by IAP Article 57, require verification, but not estimation of the status of a target. Verification does not require 100 percent accuracy in determining the status of a target, but rather due diligence and active duty to use all available means when collecting information.
13. Satellite attacks which do not strike difference between military objectives and civilian objects, such as the use of an extremely powerful explosive device to affect multiple satellites in the length of blast wave or using signal jamming technique which disturbs not only a signal of a target, but also other satellite signals in range, are indiscriminate and prohibited under IAP 51(4).
14. Principle of proportionality requires collateral damage to be estimated prior every satellite attack. The reverberating effects of attack should be assessed as long as they are foreseeable by a reasonable person. The foreseeability in that case does not only involve general knowledge and beliefs of the attack planner, but also the use of available means, such as advice of experts capable to project collateral damage. When reverberating effects of a kinetic satellite attack may not be reasonably foreseen, that does not mean that all unforeseeable effects are permissive, because when it is impossible to predict the precise effects of satellite attack, an attack may be considered indiscriminate and prohibited under IAP 51(4).
15. When assessing proportionality in attacks, causal nexus should be established between the planned ASAT activities of the attacker and potential collateral damage. Activities of the attacked state or a third state play no role in the assessment of collateral damage. Involvement of a third state or the lasting effect of collateral damage does not change proportionality assessment, neither mitigate the question of responsibility. A state planning to attack a satellite may not expect a third state to reduce collateral damage by, for example, repairing that satellite. Neither it can justify departure from collateral damage assessment if collateral damage may only be expected in a long-term.
16. The purpose of Article 36 of IAP is to prevent illegal weapons from being used in future armed conflicts. In that sense, the prudent implementation of this rule requires not only to conduct legal reviews of weapons at earliest stages of weapon development, including those prior to its testing, but also halt these procedures until a weapon is modified to correspond State's international obligations. Accordingly, the testing of kinetic ASAT weapons which, in the presence of armed conflict, could hardly correspond to *jus in bello* principle of proportionality, prohibition of indiscriminate attacks and environmental preservation rules, in most cases is incompatible with Article 36 of IAP requirements.

RECOMMENDATIONS

1. It is recommended to treat ASAT activities as attacks when:
   1.1. It may be foreseen that the targeted satellite may face negative physical effects, such as destruction;
   1.2. It may be foreseen that the owner of a targeted satellite might lose control of a satellite as a consequence of ASAT activity;
   1.3. It may be foreseen that a satellite might face repairable damage which would neutralize it;
   1.4. A satellite is also used by civilians or civilian infrastructure, especially when the ASAT activity may be expected to cause injuries or deaths of civilians, damage or destruction of civilian objects.
2. To prevent the higher risk of proportionality breach, when available, use non-kinetic satellite targeting means which can achieve analogical military advantage as in case of kinetic satellite attacks;
3. To implement requirements of precautions in attacks, give unambiguous and effective advance warning prior to targeting satellites, especially GNSS or other constellations having been widely used by civilians, unless such warning impedes the achievement of military goals;
4. When analogical military advantage may be achieved by targeting satellite ground stations instead of satellites and the estimated collateral damage is not greater compared to satellite targeting, satellite ground stations should be opted for targeting to prevent the risk of breaching principles of military necessity and proportionality;
5. If a satellite may not be identified as a military object using all available information at the time, additional information should be collected. If additional information cannot acquainted or may not suggest that a specific satellite has the probable status of military objective, a satellite should be presumed to be civilian object;
6. Whenever circumstances allow, it is suggestable to prudently opt time and place of a satellite attack. Attacking a satellite at night or over the area of less civilian signal recipients (such as high seas) might in some cases have less chances of disproportionate collateral damage;
7. The estimation of military advantage should follow these suggestions:
   7.1. In case of multiple attacks forming part of military operation the estimation of military advantage may combine single type of attacks if it is impossible to estimate military advantage of one single attack;
   7.2. If single type attacks involve targets with different threat levels on civilians and civilian objects, each attack posing threat to civilians or civilian objects should be estimated separately;
   7.3. Military advantage may be estimated only in cases when it is foreseeable;
   7.4. All attacks should be planned with concern of protecting civilians and civilian objects.

8. Satellite targeting planners should use all available means, including advice from engineers or other experts, to foresee and estimate the collateral damage as it is required by principle of proportionality.
9. An attacking party is recommended to consider the following factors before waging an ASAT attack:
    9.1. The altitude of the targeted satellite;
    9.2. Estimated amount of space debris;
    9.3. The space debris cloud potential orbital arrangement;
    9.4. The preliminary duration it would take for space debris to burn in the atmosphere;
    9.5. The density of satellites in the relative orbit;
    9.6. The relevance of satellite signals on civilian Earth technologies;
    9.7. The amount of injuries or deaths to civilians, damage or destruction of civilian objects which may be foreseen as a result of loss of targeted satellite signal.
10. It is not recommended to attack a satellite providing PNT data (GNSS satellites) having most risk of causing unexpectable, uncalculatable, and inestimable collateral effects, because prudent application of proportionality principle does not allow attacks when collateral damage is inestimable.
11. It is recommended to use a consequence-based approach when determining whether an ASAT activity should follow targeting rules. If the ASAT activity is likely to negatively affect civilians or civilian objects, such an activity should be scrutinized in terms of targeting rules;
12. When drafting legal reviews of ASAT weapons, states should consider whether the use of an ASAT weapon would generate space debris and, if it does, estimate the amount of it, the orbital spread and how long could they possibly last before re-entry.

MYKOLO ROMERIO UNIVERSITETAS

Tomas Marozas

PALYDOVAI KAIP TAIKINIAI PAGAL *JUS IN BELLO*

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Mokslinis vadovas:
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Tomas Marozas

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SANTRAUKA

Tyrimo problema

Kai kurių teigimu, kosmoso technologijos vystėsi per lėtai. Buvęs Nacionalinės aeronautikos ir kosmoso administracijos (NASA) astronautas, paskutinis žmogus stovėjęs ant Mėnulio paviršiaus, Eugene Cerman, būdamas 75 metų amžiaus, savo susirūpinimą Jungtinių Amerikos Valstijų (toliau – JAV) prarasta ambicija užkariauti kosmosą išreiškė šiais žodžiais: „Aš tikrai tikėjau, kad šio dešimtmečio pabaigoje mes grįšime į Mėnulį, o besibaigiant tūkstantmečiui, nuskrisime į Marsą... Tačiau mano taurė pusiau tuščia jau gerus tris dešimtmečius.“[1088] Iš tiesų, jei paanalizuotume Ekonominio bendradarbiavimo ir plėtros organizacijos (toliau – EBPO) identifikuotus pagrindinius kosmoso technologijų sektorius, pamatytume, kad pagrindinės kosmoso technologijos nepakito, veikiau buvo iš esmės patobulintos.[1089] Pavyzdžiui, padėties nustatymo, navigacijos ir laiko paslaugos, kurias teikia Globalios padėties nustatymo palydovų sistemos (angl., Global Navigation Satellite System, toliau – GNSS) palydovai vystomos nuo praėjusio tūkstantmečio aštuntojo dešimtmečio.[1090] Antrą kartą panaudojamos raketos, kaip antai, SpaceX kompanijos Falcon 9 raketa, yra dešimtmečius skaičiuojančių tarpkontinentinių balistinių raketų (toliau – ICBM) modernizacijos pavyzdys.[1091] Šiais pavyzdžiais nesiekiama implikuoti, kad kosmoso technologijų ekonomika yra statiška, veikiau ne tokia sparti, kaip tikėtasi.

Nors ir galima kelti klausimą dėl kosmoso technologijų vystymosi spartos, tačiau neginčijama tiesa yra ta, kad kosminė erdvė tampa vis labiau ir labiau apkrauta. Lyginant su Šaltojo karo laikotarpiu, kuomet tebuvo dvi pagrindinės kosminės valstybės – JAV ir Sovietų Sąjunga – šiuo metu aktyviai į kosminę veiklą įsitraukusios Kinija, Indija, Iranas, Izraelis, Šiaurės Korėja, Japonija, Jungtinė Karalystė, Prancūzija ir daugelis

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1088 Jacqui Goddard, “Apollo astronauts lament America’s lost ambition”, New York Times, 2009, žiūrėta, August 5, 2020, https://www.thetimes.co.uk/article/apollo-astronauts-lament-americas-lost-ambition-2q8h96fwx6p.

1089 Pavyzdžiui, palydovų komunikacijos (balsu, duomenų, internetas, and multimedija), transliacijos (televizijos ir radijo paslaugos, vaizdo paslaugos, interneto turinio tiekimo paslaugos), padėties nustatymo, navigacijos ir laiko paslaugos, kt. OECD, “OECD Handbook on Measuring the Space Economy, 2nd Edition,” OECD iLibrary, 2022, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

1090 NASA, “Global Positioning System History,” NASA TV, 2012, https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html.

1091 Žr. “1. THE RELEVANCE OF SATELLITES”; SpaceX, “Falcon 9 - First Orbital Class Rocket Capable of Reflight,” accessed August 18, 2022, https://www.spacex.com/vehicles/falcon-9/.

kitų Europos valstybių per konsoliduotą Europos Kosmoso Agentūros (toliau – ESA) platformą. Lietuva, kaip sąlyginai maža dalyvė kosminėje veikloje, jau yra paleidusi į orbitą palydovą,[1092] o Lietuvoje įsisteigę įmonės gamina palydovus.[1093] Kosmoso decentralizacija yra vis labiau ir labiau matoma, šis sektorius nebėra vien valstybių monopolis. Privataus kapitalo įmonės užima gana svarbią vietą kosmoso ekonomikoje – SpaceX, Virgin Galactic, Blue Origin, Boeing, Starchaser – yra tik keletas šiame konkurencingame versle veikiančių įmonių pavyzdžių. Vien tik per paskutinį dešimtmetį, kosmoso sektorius iš esmės pasikeitė – ženkliai sumažėjo kosmoso prieinamumo išlaidos, buvo pradėta skirti daugiau dėmesio skaitmeninių kosmoso technologijų plėtotei. Ganėtinai nemažai kosmoso startuolių yra ne tik gamybinės įmonės, tačiau ir kuria skaitmeninius išteklius.[1094] Auganti aukštos kokybės kosmoso paslaugų paklausa ne tik paskatino paleisti daugiau įrenginių į kosmosą, tačiau ir pritraukė daugiau dalyvių kosmoso ekonomikoje.[1095] 2021 metais buvo paleista į orbitą rekordiškai daug raketų (145 paleidimai lyginant su 84 paleidimais 2011 metais), kosmoso industrijos vertė pasiekė rekordines aukštumas (423,8 mlrd. JAV dolerių, lyginant su 2011 m. 289,8 mlrd. JAV dolerių), paleista į orbitą rekordiškai daug krovinių (1 730 lyginant su 129 2011 m.), net kosmoso turistų grožėjosi žeme daugiau nei bet kada (22, o 2011 m. nebuvo nei vieno).[1096] Nuo 1957 iki 2022 metų į kosmosą iš viso buvo paleistas 13 451 objektas,[1097] iš kurių vos mažiau nei trečdalis tebeveikia. Iš viso suskaičiuojama 30 000 sekamų kosmoso šiukšlių (didesnių nei 10 cm dydžio)[1098] ir apie 170 milijonų dalelių

1092 "Lithuanian Satellite Launched to Space from India," Delfi.lt, accessed August 18, 2022, https://www.delfi.lt/en/business/lithuanian-satellite-launched-to-space-from-india.d?id=75027666.

1093 See UAB NanoAvionics, homepage: https://nanoavionics.com/.

1094 OECD, "OECD Handbook on Measuring the Space Economy, 2nd Edition," OECD iLibrary, 2022, 31, https://www.oecd-ilibrary.org/science-and-technology/oecd-handbook-on-measuring-the-space-economy-2nd-edition_8bfef437-en.

1095 National Air and Space Intelligence Center, "Competing in Space," 2018, https://media.defense.gov/2019/Jan/16/2002080386/-1/-1/1/190115-F-NV711-0002.PDF.

1096 Space Foundation, "2021 Annual Space Report" (Colorado Springs, 2021), 1, https://www.spacefoundation.org/wp-content/uploads/2022/04/SpaceFoundation_2021-Annual-Report_Final-1.pdf; Space Foundation, "Space Foundation's 2012 Report Reveals 12.2 Percent Global Space Industry Growth in 2011," https://www.spacefoundation.org/2012/04/05/space-foundations-2012-report-reveals-12-2-percent-global-space-industry-growth-in-2011/; Annual Number of Objects Launched into Space, Our World In Data, https://ourworldindata.org/grapher/yearly-number-of-objects-launched-into-outer-space?country=OWID_WRL~USA~RUS~CHN~GBR~JPN~FRA~IND~DEU~European+Space+Agency.

1097 United Nations Office for Outer Space Affairs, "Online Index of Objects Launched into Outer Space", https://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id=#?c=%7B%22filters%22:%5B%5D,%22sortings%22:%5B%7B%22fieldName%22:%22object.launch.dateOfLaunch_s1%22,%22dir%22:%22desc%22%7D%5D,%22match%22:null%7D.

1098 European Space Agency, "About Space Debris," žiūrėta August 18, 2022, https://www.esa.int/Space_Safety/Space_Debris/About_space_debris.

nesekamų.[1099] Ateinančio dešimtmečio planai stebina ir neramina vienu metu – vien kompanija SpaceX planuoja paleisti 42 000 palydovus, kad visiškai suformuotų Starlink palydovų tinklą.[1100]

Vis augantis į kosmosą paleidžiamų objektų skaičius kelia tiek gamtosauginių, tiek saugumo iššūkių. Iš aplinkos apsaugos pusės, apkrautos palydovais orbitos ir po paleidimų jose liekančios kosmoso šiukšlės apsunkina patekimą į kosmosą. Kita vertus, augantis valstybinių ir nevyriausybinių subjektų, dalyvaujančių su kosmosu susijusioje veikloje skaičius, kelia karinių iššūkių pagrindinėms kosmoso valstybėms. Paskutinėje JAV saugumo strategijoje teigiama, kad kosmoso demokratizacija sukelia neigiamų padarinių karinėms JAV operacijoms ir jos galimybėms išlikti stiprioms konfliktuose.[1101] Palydovų teikiamos paslaugos yra ypač svarbios šiuolaikinėms karinėms operacijoms – karinės žvalgyba, orų prognozavimą, karinės komunikacija, išmaniųjų raketų panaudojimas – tik keletas akivaizdžių pavyzdžių, atspindinčių kosmoso technologijų karinį potencialą. Nebūtų klaidinga teigti, kad technologinis dominavimas kosminėje erdvėje lemia karinį dominavimą ant žemės (bent jau iš dalies). Paskutiniai dešimtmečiai pasižymėjo kinetinės priešpalydovinės ginkluotės bandymų gausa, kurie susilaukė neigiamų atgarsių dėl sukeliamų kosminių šiukšlių ir pavojaus kitiems palydovams. 2007 metais, Kinija sėkmingai išbandė žemė-kosmosas priešpalydovinį ginklą ir paskatino kitas valstybes imtis analogiškų veiksmų. Kaip antai, 2008 metais JAV susprogdino sau priklausantį nebeveikiantį žvalgybinį palydovą, 2019 – Indija, o paskiausiai 2021 metais – Rusija. Šie keturi kinetinių priešpalydovinių ginklų bandymai padidinto kosmoso šiukšlių skaičių 25 procentais skaičiuojant nuo 1957 metų.[1102] Augantis kosmoso šiukšlių skaičius ne tik apsunkina pateikimą į kosmosą ir kosminius tyrinėjimus, tačiau kelia grėsmę kitiems palydovams bei civilinėms technologijoms, priklausančioms nuo palydovų. Kuriami ne tik kinetiniai, tačiau ir nekinetinio pobūdžio ginklai, kaip antai, lazeriai arba signalų blokavimo ginklai. Pastarieji ginklai ne tik bandomi, tačiau ir faktiškai naudojami šiuolaikiniuose konfliktuose. Nėra jokių abejonių, kad neretai sutinkamas fantastika dvelkiantis fenomenas „kosminės erdvės militarizacija“[1103] įgavo akivaizdžią praktinę išraišką.

Ginkluotos kovos veiksmus reguliuojanti teisės šaka, tarptautinė humanitarinė teisė (toliau – THT), dar vadinama ginkluoto konflikto teise, arba *jus in bello,* ypač

1099 European Space Agency, “How Many Space Debris Objects Are Currently in Orbit?,” accessed August 18, 2022, https://www.esa.int/Space_Safety/Clean_Space/How_many_space_debris_objects_are_currently_in_orbit.

1100 Michele Yan Huang and Dave Mosher, “What Elon Musk’s 42,000 Starlink Satellites Could Do for — and to — Planet Earth,” Business Insider, 2021, https://www.businessinsider.com/how-elon-musk-42000-starlink-satellites-earth-effects-stars-2020-10.

1101 The White House, “National Security Strategy of the United States of America,” 2017, 31, https://history.defense.gov/Portals/70/Documents/nss/NSS2017.pdf?ver=CnFwURrw09pJ0q5EogFpwg%3D%3D.

1102 European Space Agency, “About Space Debris.”

1103 Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945-1984* (New York: Cornell University Press, 1985).

puolimo procesą reguliuojančios jos normos, nepasižymi kintančia rašytine teisine išraiška. Nuo 1949 m. rugpjūčio 12 d. Ženevos konvencijų Papildomo protokolo dėl tarptautinių ginkluotų konfliktų aukų apsaugos (I protokolas) (toliau – IPP) ir 1949 m. rugpjūčio 12 d. Ženevos konvencijų Papildomas protokolas dėl netarptautinių ginkluotų konfliktų aukų apsaugos (II protokolas) (toliau – IIPP) priėmimo nebuvo priimta naujų tarptautinių sutarčių, išskyrus pavienius ginklus ribojančius susitarimus. Remiantis šiuo faktu, rodos, galima būtų iš anksto suformuluoti keletą hipotetinių teiginių: beveik pusamžio senumo modernioji THT nebėra moderni ir dėl to būtina priimti naujas tarptautines sutartis, kad būtų galima išvengti teisiškai neapibrėžto veikimo. Kita vertus, toks teiginys yra nieko vertas be išsamios *lex lata* teisinės analizės, kurios pagalba būtų galima pasverti papildomo teisinio reguliavimo naudą ir sudėtingą universalios tarptautinės sutarties rengimo procesą. Talino vadovo[1104] rengimo procesas laikytinas pavyzdiniu tarptautinės teisės adaptavimosi naujiems teisiniams santykiams pavyzdžiu interpretacijos, o ne naujo reguliavimo keliu. Talino vadovo autoriai ginčijo hipotetinę papildomo reguliavimo būtinybę teigdami, kad kartais jis gali būti pasiekiamas vien *lex lata* persvarstymu.[1105] Kiti atskirų karo veiksmų teatrų vadovai[1106] liudija tendenciją tarptautinei teisei vystytis interpretavimo, o ne naujų sutarčių, neretai sukeliančių normų fragmentaciją, keliu.

Tarptautinės teisės komisija 2006 metais pristatė tarptautinės teisės fragmentacijos ataskaitą,[1107] kurioje išryškino specializuoto norminio ar institucinio radimosi paradigmą ignoruojant egzistuojančią teisinę realybę kituose teisiniuose laukuose.[1108] THT ir tarptautinė kosmoso teisė (toliau – TKT) vystėsi atskirai viena nuo kitos, atitinkamai dėl to radosi viena su kita neretai nesuderinamų normų. Pavyzdžiui, TKT pamatas – 1967 Sutartis dėl valstybių veiklos tyrinėjant ir naudojant kosminę erdvę, įskaitant mėnulį ir kitus dangaus kūnus, reguliavimo principų (toliau – Kosminės erdvės sutartis)[1109] – įpareigoja ypatingai saugoti astronautus laikydama juos „žmonijos pasiuntiniais“, tuo tarpu THT leidžia žudyti ginkluotųjų pajėgų narius, laikomus kombatantais. Atsižvelgiant į tai, kad astronautas neretai ir yra ginkluotojų pajėgų narys,

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1104 Michael N. Schmitt, ed., *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (Cambridge: Cambridge University Press, 2017) (hereinafter - Tallinn Manual), 3.

1105 Tallinn Manual.

1106 San Remo Manual interpreting LOAC at sea, International Institute of Humanitarian Law, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, ed. Louise Doswald-Beck (Cambridge: Cambridge University Press, 1995) (hereinafter - San Remo Manual); Cambridge Manual interpreting LOAC in the air (Manual on International Law Applicable to Air and Missile Warfare (Program on Humanitarian Policy and Conflict Research at Harvard University, *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge, 2013).

1107 Study Group of the International Law Commission, "Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law," 2006, (hereinafter - ILC Fragmentation Report), https://doi.org/10.18356/ed47d916-en.

1108 ILC Fragmentation Report, 10.

1109 Treaty on principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies, Oct. 10, 1967, 610 U.N.T.S. 205 (hereinafter – OST).

gali kilti klausimas ar tarptautinė teisė leidžia, ar draudžia pulti astronautus, jei jie priklauso ginkluotosioms pajėgoms? Jei toks astronautas yra sulaikomas, ar jis turėtų būti grąžinamas į savo kilmės valstybę, kaip to reikalauja TKT, ar, priešingai, paimamas į nelaisvę, kaip tą reglamentuoja THT? Negana to, TKT reikalauja ypatingo valstybių bendradarbiavimo bei inicijuoti tarptautines konsultacijas, jei tik iškyla grėsmė vienos valstybės veiksmais pakenkti kitos valstybės interesams kosminėje erdvėje. Jei šią nuostatą norėtume taikyti ginkluoto konflikto sąlygomis, susidarytų įspūdis, kad prieš kiekvieną puolimą ginkluoto konflikto šalis turėtų pasikonsultuoti su puolamąja valstybe, jei būtų puolamos jos kosmoso technologijos. Nepaisant to, kad toks pavyzdys skamba ganėtinai paradoksaliai, nenuneigsime to, kad TKT ir THT būdamos skirtingos tarptautinės viešosios teisės šakos tapo dar vienu tarptautinės teisės fragmentacijos pavyzdžiu. Visa tai veda prie pirmosios šio tyrimo problemos – teisinio netikrumo dėl THT ir TKT galimai konfliktuojančių normų taikymo. Kitais žodžiais tariant, tam tikromis aplinkybėmis, susijusiomis su priešpalydovinėmis karinėmis operacijoms nėra aišku, kurią normą derėtų taikyti. Neišsprendus šios problemos, neįmanoma visapusiškai analizuoti pagrindinio šiame tyrime palydovų puolimo teisėtumo klausimo. Todėl THT ir TKT santykio nustatymas laikytinas šios disertacijos pagrindinį tyrimą aktualizuojančiu pagrindu.

Puolimo taisyklės taikomos specifinei karinių operacijų rūšiai – puolimams (angl. *attacks*). Nepaisant to, kad puolimų sąvoka yra apibrėžta,[1110] nėra pasakoma, kokia žalos forma jie turėtų pasižymėti. Priešpalydovinės priemonės apima ne tik kinetines, tačiau ir nekinetines, pavyzdžiui, signalų blokavimo ar signalų apgaulės (angl. *spoofing*) technologijas. Dėl šios priežasties vienos priešpalydovinės priemonės gali būti reguliuojamos puolimo taisyklių, kitos – ne. Pažymėtina, kad valstybės jau turi ir naudoja nekinetines priešpalydovines priemones, tačiau reglamentavimas šiuo požiūriu nėra aiškus. Kurie priešpalydoviniai veiksmai laikytini puolimais ir atitinkamai reglamentuojami puolimų normomis – antroji šioje disertacijoje formuluojama problema.

Puolimo taisyklės reikalauja tinkamai nustatyti taikinį. Galiojantis TKT režimas reikalauja registruoti į kosminę erdvę paleidžiamus objektus ir, be kitų reikalavimų, įvardinti bendrą paleidžiamo objekto funkciją.[1111] Natūralu, šis reikalavimas neįtvirtina pareigos įvardinti paleidžiamą į kosmosą objektą nei kariniu, nei civiliniu. Sunku įsivaizduoti, kad valstybė galėtų sutikti su tokia pareiga atskleisti karines paslaptis ar kitaip sumenkinti nacionalinį saugumą. THT įpareigoja tik puolančiąją valstybę identifikuoti potencialų taikinį. Tik karinio objekto statusą atitinkantys objektai gali būti puolami.[1112] Karinio objekto statuso nustatymo procesą komplikuoja palydovų atstumas nuo Žemės bei ekstremalios sąlygos kosminėje erdvėje. Negana to, nemaža dalis

1110 IPP, 49(1) str.

1111 Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 1023 U.N.T.S. 15, Art. 4.

1112 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), Jun. 8, 1977, 1125 U.N.T.S. 3 (hereinafter – 1977 IAP), art. 52(2).

palydovų tuo pačiu metu siunčia signalus tiek kariniams, tiek civiliniams objektams, o nustatyti signalų recipientą konkrečiu metu yra beveik neįmanoma. Kyla klausimas, liudijantis trečiąją šio tyrimo problemą, ar palydovo teisinis statusas priklauso nuo signalo gavėjo ir kaip reikėtų teisiškai traktuoti dvigubos paskirties palydovus?

Klausimų kelia ne tik palydovų, tačiau ir kosminės erdvės teisinis statusas. Viena iš THT ypatybių yra ta, kad be bendro objektų skirstymo į karinius ir civilinius (suteikiant apsaugą nuo puolimo tik pastariesiems), ši tarptautines teisės šaka įtvirtina ir *sui generis* apsaugos mechanizmus. Pavyzdžiui, THT įpareigoja saugoti gamtinę aplinką nuo karo pavojų laikantis tam tikrų sąlygų.[1113] Kinetinių priešpalydovinių ginklų panaudojimo metu susidaro galybė kosmoso šiukšlių, o tai kelia gamtosauginių klausimų. Šiame kontekste, galima svarstyti, ar, pirma, kosminė erdvė yra laikytina gamtine aplinka pagal THT ir, antra, ar sukeliamos šiukšlės laikytinos žala šiai aplinkai. Kosminės erdvės neapibrėžtas teisinis statusas pagal THT – ketvirtoji šio tyrimo problema.

Puolimo procesas nesibaigia taikinio nustatymu, nemažai kitų skaičiavimų turi būti atliekama iki puolant, įskaitant ėmimąsi tam tikrų atsargumo priemonių siekiant sumažinti atsitiktinę puolimo žalą bei palyginti ją su galimu kariniu pranašumu. Šis procesas, vadinamas proporcingumo vertinimu, yra savaime komplikuotas, kadangi reikalauja pasverti ir palyginti nepalyginamas vertybes, o kosminė erdvė ir nutolusios technologijos joje dar labiau apsunkina šį procesą. Taip yra dėl to, kad yra sunku nuspėti, kokių padarinių gali sukelti palydovo signalo praradimas. Palydovo puolimas gali ne tik sugadinti patį palydovą, tačiau jo prarastas signalas gali sugadinti įrenginius Žemėje, o tai gali lemti civilių sužalojimus ar net žūtis. Užblokavus GNSS palydovų signalus ne tik išmaniosios raketos gali nepataikyti į taikinius, tačiau lėktuvai nenusileisti oro uostuose, autonominiai automobiliai patekti į avarijas, sutrikti centrinis šildymas žiemą, griūti prekyba akcijomis, nebeveikti bankomatai, rastis potvyniai sutrikus sinchronizuotoms užtvankų sistemoms, persipildytų ligoninės ir kt. Iš teisinės pusės, negalėjimas įvertinti galimos atsitiktinės žalos komplikuoja proporcingumo principo taikymą. Žinant tai, kad THT neleidžia nesilaikyti šio principo, kyla klausimas, kiek efektyvus šis principas palydovų puolimo kontekste? Be to, THT neapibrėžia atsitiktinės žalos ir kokios tąsos atoveiksmiai (angl. *reverbarating effects*) po puolimo turėtų būti vertinami. Ar puolančioji šalis prieš puldama turėtų atsižvelgti tik į tiesioginius puolimo padarinius, pavyzdžiui, sunaikintą palydovą ir prarastą signalą, ar daugiau, pavyzdžiui, tikėtinas civilių aukas dėl prarasto signalo? Tai yra penktoji šio tyrimo problema.

Atskyrimo principas yra vienas iš pagrindinių THT principų. Jis įpareigoja ginkluoto konflikto šalis išsiskirti nuo civilių ir pulti tik karinius objektus. Nepaisant tiesioginės šio principo prasmės, atskyrimo principas sukuria nemažai išvestinių pareigų, pavyzdžiui, draudžia puolimus be atrankos.[1114] Puolimais be atrankos laikomas tokių kariavimo būdų ir priemonių panaudojimas, kurių sukeliamų padarinių negalima sukontroliuoti ir atitinkamai smogiama tiek kariniams, tiek civiliniams objektams.

1113 IPP, 35(2) str. ir 55 str.

1114 IPP, 51(4) str.

Atsižvelgiant į tai, kad kinetinių priešpalydovinių ginklų panaudojimas sukelia daug nekontroliuojamai orbitomis skriejančių kosmoso šiukšlių, keltinas klausimas, ar šie puolimai prilygsta puolimams be atrankos ir yra draustini? Kita vertus, nuostata, draudžianti puolimus be atrankos, nenurodo, kad turi būti atsižvelgiama ir į netiesioginius puolimo padarinius. Kaip žinia, kinetiniai priešpalydoviniai ginklai naudodami sensorius ypač taikliai pataiko į taikinius. Taigi būtų sunku teigti, kad pirminiai šio ginklo padariniai – pataikymas į palydovą – prilygsta puolimams be atrankos. Iš to kas pasakyta, formuluotina dar viena tyrimo problema – ar priešpalydoviniai kinetiniai veiksmai sukuriantys kosmoso šiukšles atitinka puolimų be atrankos sąvoką ir yra draustini?

Nepaisant to, kad THT daugiausiai yra taikoma ginkluotų konfliktų metu, kai kurios nuostatos yra taikomos ir taikos metu. Viena iš tokių nuostatų įtvirtina reikalavimą valstybėms atlikti teisinį naujos ginkluotės vertinimą ją tiriant, rengiant, įsigyjant arba pripažįstant tinkama. Kitais žodžiais tariant, kiekviena valstybė prieš „modernizuodama" savąją karinę įrangą pirmiausiai turi ne tik ištirti jos technines savybes, tačiau ir teisiškai įvertinti, ar tokios ginkluotės ar metodo panaudojimas ginkluoto konflikto metu atitiktų THT ir apskritai valstybės tarptautinių įsipareigojimų keliamus reikalavimus.[1115] Verta priminti, kad THT neįtvirtina šios pareigos priežiūros mechanizmo, todėl neįmanoma patikrinti, ar šios pareigos yra iš tikrųjų laikomasi. Net jei valstybė skrupulingai atlieka teisinį naujos ginkluotės vertinimą, net jei teisinę išvadą rengiantis tarnautojas nėra priklausomas nuo karinių vadovų ar politikų ir parengia objektyvią išvadą, teigiančią, kad nauja ginkluotė pažeidžiančia THT taisykles, nėra nustatyta, kokius padarinius galėtų sukelti ši neigiama išvada. Ar valstybė turėtų nustoti vystyti ginkluotę ar bent jau pakeisti esminius vystomos ginkluotės bruožus, kad ji atitiktų THT standartus ir tik tuomet tęsti jos vystymą? IPP nepateikia atsakymo į šiuos klausimus, todėl paskutinis šioje disertacijoje spręstinas klausimas susijęs su priešpalydovinės ginkluotės teisiniu vertinimu ir įvertinimu, ar kariniams veiksmams taikytina teisė gali pažaboti taikos meto kinetinės priešpalydovinės ginkluotės bandymus.

Atsižvelgiant į neigiamus kinetinės priešpalydovinės ginkluotės bandymų padarinius ir valstybių pareiškimus dėl tokios praktikos uždraudimo,[1116] šios temos analizė gali paskatinti diskusijas dėl uždraudimo ir padėti teisininkams, rengiantiems teisinį šios ginkluotės vertinimą.

1115 IPP 36 str.

1116 Daryl G. Kimball, "U.S. Commits to ASAT Ban," Arms Control, 2022, https://www.armscontrol.org/act/2022-05/news/us-commits-asat-ban; Jeff Foust, "Canada Joins U.S. in ASAT Testing Ban," Space News, 2022, https://spacenews.com/canada-joins-u-s-in-asat-testing-ban/; Spacewatch, "Russia's Roscosmos To Initiate Talks On Kinetic Kill ASAT Ban," Spacewatch Global, 2019, https://spacewatch.global/2019/12/russias-roscosmos-to-initiate-talks-on-kinetic-kill-asat-ban/; Talia M. Blatt, "Anti-Satellite Weapons and the Emerging Space Arms Race," Harvard International Review, 2020, https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/.

Problemos aktualumas

Kosminei erdvei tampant vis tankiau apkrautai palydovais ir vis labiau militarizuojantis,[1117] teisinės diskusijos dėl šio fenomeno jau persikėlė į tarptautinį lygmenį. 2020 metais Jungtinių Tautų (toliau – JT) Generalinė Asamblėja (toliau – UNGA) priėmė rezoliuciją skatinančią valstybes nares išnagrinėti galimas grėsmes kosmoso sistemoms ir pasidalinti mintimis, kaip turėtų vystytis norminė aplinka užtikrinti, kad valstybių veiksmai kosminėje erdvėje būtų kuo atsakingesni.[1118] Daugelis valstybių vienbalsiai įvardijo priešpalydovinę ginkluotę kaip keliančią grėsmę kosmoso saugumui. Net skandalingiausio kinetinio ginklo bandymo autorė Kinija pripažino, kad kosmoso apginklavimo užkardymas yra esminė sąlyga užtikrinti saugumą.[1119] Visuotinis susirūpinimas kosmoso saugumu ne tik paverčia disertacijoje analizuojamą temą aktualia, tačiau ir galimai praktiškai naudinga.

Moderniosios karo normos veikia nuo 1977 metų. Šios normos pirmiausiai buvo kurtos sureguliuoti sausumos ir jūrų (bei ganėtinai maža dalimi – oro) karybą. Nei viena iš tų normų nemini kosminės erdvės. Daugelis THT nuostatų yra ganėtinai plačiai suformuluotos ir kelia tam tikrų taikymo iššūkių. Nepaisant to, tai nebūtinai laikytina trūkumu. Neretai bendra THT normų prigimtis tiesia ganėtinai patogų kelią normų interpretacijai. THT galimai yra adaptyvi teisės šaka, prisitaikanti prie technologinių naujovių ir nereikalaujanti papildomo reguliavimo. Jei taip iš tiesų yra, THT galėtų ganėtinai smarkiai pasistūmėti ir kosmoso karų reguliavimo srityje.

Kosminės erdvės svarba teikiant globalias paslaugas, karinė palydovų reikšmė ir su palydovų puolimu susijusi besivystanti valstybių praktika aktualizuoja disertacijoje nagrinėjamą temą, ypač žinant, kad rašytinių palydovų puolimo taisyklių ar net autoritetingų galimas palydovų puolimų taisykles analizuojančių komentarų nėra. Ankstesnėje dalyje įvardintos problemos leidžia suprasti, kad teisė anaiptol nėra aiški ir vienprasmiška šioje srityje. Šios problemos palyginti retai aptariamos moksliniuose šaltiniuose, ką jau kalbėti apie pasiūlymus joms spręsti.

Tyliai kosmine erdve skriejantys palydovai neretai padeda atlikti triukšmingus ir destruktyvius veiksmus Žemėje. Jie yra patrauklūs taikiniai, kadangi jų trajektorijos yra apskaičiuojamos, jie neturi daug galimybių išvengti raketų, galinčių sukelti neproporcingai didelį kiekį šiukšlių dėl didelių greičių ir atitinkamai didelės kinetinės energijos kosmose. Palydovų puolimo normų nebuvimas gali sudaryti įspūdį, kad ši veikla yra teisiškai nereglamentuojama. Toks požiūris gali vesti prie Keslerio sindromo[1120] realizacijos, esminės žalos ir aukų Žemėje. Tai yra dar viena priežastis, kodėl

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1117 Žr. Joan Johnson-Freese, *Space warfare in the 21st century : arming the heavens* (New York: Routledge, 2017), 26-55.

1118 GA Res 75(36), UNGAOR, UN Doc A/RES/75/36 (2020), 3/3, para. 5.

1119 Document of the People's Republic of China pursuant to UNGA Resolution 75/36 (2020), https://front.un-arm.org/wp-content/uploads/2021/05/Chinas-Position-on-Outer-Space-SecurityEnglish.pdf.

1120 Žr. Mike Wall, "Kessler Syndrome and the Space Debris Problem," Space.com2, 2021, https://www.space.com/kessler-syndrome-space-debris.

THT taikymo kosminėje erdvėje klausimas yra gyvybiškai aktualus. Nepaisant to, kad dėl kai kurių aspektų, aptartų Talino vadove, debatai tebevyksta (autorius pateikia tam tikros kritikos šiame darbe), autoriaus nuomone, ekspertų grupės darbas rengiant Talino vadovą yra sėkmės istorijos pavyzdys, liudijantis THT bruožą prisitaikyti interpretavimo būdu prie technologinių inovacijų kibernetinėje erdvėje. Karinių operacijų kosminėje erdvėje kontekste, rengiami du tarptautinės teisės vadovai. Pirmasis, vadinamas Magilio arba Milamoso (angl. *McGill*, *Milamos*)[1121] vadovu, analizuoja tarptautinės teisės taikymo ypatumus naudojant kosminę erdvę kariniais tikslais, antrasis, vadinamas Vumeros (angl. *Woomera*)[1122] vadovu, analizuoja tarptautinės teisės taikymą karinėms operacijoms kosminėje erdvėje. Paprasčiau tariant, Magilio vadovas analizuoja taikos meto karinių kosmoso technologijų panaudojimo atitiktį tarptautinei teisei, o antrasis – karo. Pažymėtina, kad Magilio vadovo pirmoji dalis, įvardijanti taisykles (be komentaro), jau parengta ir pateikta vertinimams,[1123] tačiau disertacijos turiniui aktualus Vumeros vadovas dar neparengtas. Magilio ekspertų grupė pabrėžė ypatingą jų misiją – užtikrinti, kad kosminėje erdvėje nebūtų kovojama ir ji būtų naudojama saugiai bei tvariai remiantis tarptautine tvarka.[1124] Išties, Magilio vadovų vizija išvengti ginkluoto konflikto kosminėje erdvėje yra vaizdinga ir idealistinė, tačiau, deja, valstybių praktika jau pasuko kita linkme ir sunku būtų patikėti, kad greitu metu kosminė erdvė bus demilitarizuota, valstybės atsisakys išmaniųjų raketų, žvalgybos ar koduoto ryšio priemonių. Šios priežastys rodo, kad palydovų puolimo klausimas yra aktualus ir toks liks ateityje.

Aktualių šaltinių apžvalga

Kosmoso karų tema nėra nei nauja, nei išsemta. Tai kompleksinė, tarpdisciplininė, specifinių fizikos, palydovų inžinerijos ir kitų žinių reikalaujanti tema. Dėl šios priežasties, naudojami ne tik teisiniai šaltiniai. Paminėtini šie, tyrime naudotų neteisinės literatūros šaltinių autoriai: John J. Klein,[1125] Joan Johnson-Freese,[1126] David Pahl,[1127] M. N. Sirohi.[1128] Priešpalydonių ginklų inžineriniai ir technologiniai aspektai yra svarbūs atliekant šį tyrimą. Joseph A. Jr. Angelo ganėtinai paprastai aprašė esminius

1121 McGill University, "The McGill Manual on International Law Applicable to Military Uses of Outer Space," accessed August 18, 2022, https://www.mcgill.ca/milamos/.

1122 The University of Adelaide, "The Woomera Manual," accessed August 18, 2022, https://law.adelaide.edu.au/woomera/.

1123 Atsižvelgiant į šio tyrimo objektą, tik Vumera vadovas yra aktualus, kadangi Magilio vadovas tiesiogiai nesprendžia *jus in bello* klausimų, ypač kiek tai susiję su palydovų puolimu.

1124 Ram S. Jakhu & Steven Freeland, eds, McGill Manual on International Law Applicable to Military Uses of Outer Space: Volume I - Rules (Montreal: Centre for Research in Air and Space Law, 2022), 1.

1125 John J. Klein, *Space Warfare: Strategy, Principles and Policy* (New York: Routledge, 2006).

1126 Joan Johnson-Freese, *Space Warfare in the 21st Century: Arming the Heavens* (New York: Routledge, 2017).

1127 David Pahl, *Space Warfare and Strategic Defense* (London: Bison Books, 1987).

1128 M. N. Sirohi, *Military Space Force and Modern Defense* (New Delhi: Alpha Editions, 2016).

kosmoso ginklų bruožus,[1129] Pat Norris nagrinėjo kosmoso žvalgybos klausimus,[1130] Jacob G. Oakley išryškio kibernetinių atakų reikšmę karinėse kosmoso operacijose.[1131] Tai tik keletas ne teisės krypties knygų, kurios ženkliai prisidėjo atliekant tyrimą. Deja, to paties negalima pasakyti apie teisinę, o ypač tarptautinės teisės, literatūrą. Autorius neaptiko nei vieno kompleksinio leidinio, kuriame būtų nagrinėtas kosmoso karų fenomenas per tarptautinės teisės prizmę. Pagrindiniai tyrimų šaltiniai šia tema parašyti straipsnių periodiniuose leidiniuose ar knygų skyrių pavidalu. Įvairūs autoriai ganėtiniai aktyviai tyrinėjo THT taikymo kosminėje erdvėje galimybes. Kubo Mačak išsamiai analizavo šią temą bei identifikavo pagrindines THT ir TKT galimai konfliktuojančias normas.[1132] Franz von der Dunk[1133] ir Dale Stephens[1134] pasiūlė TKT ir THT norminių konfliktų sprendimo modelius. William H. Boothby, nagrinėjo palydovų puolimo klausimus keliuose jo knygų skyriuose bei išryškino esmines THT taikymo problemas.[1135] Melissa de Zwart, rengusi vieną iš skyrių jau minėto William H. Boothby's redaguotoje knygoje, pristatė problemas, susijusias su normu taikymu kosminėje erdvėje, tačiau dėmesį skyrė *jus ad bellum* reguliavimui.[1136] Duncan Blake, su kuriuos autorius konsultavosi rendamas disertaciją, yra vienas iš lyderiaujančių tyrėjų šioje srityje. Jo tyrimai susiję su kariniu strateginiu kosminės erdvės panaudojimu ir šiems veiksmams taikytina teise.[1137] Nors ir ganėtinai glaustai, tačiau Dunkan Blake taip pat nagrinėjo iš *jus in bello* taikymo kosminėje erdvėje kylančias problemas.[1138] Jackson Maogoto nagrinėjo kosmoso karų temą *jus ad bellum* kontekste.[1139] Bill Boothby išsamiai aptarė kosminius ginklus ir ypatingą dėmesį skyrė puolimams

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1129 Joseph A. Jr. Angelo, *Frontiers in Space: Satellites* (New York: Infobase Publishing, 2006);

1130 Pat Norris, *Spies in the Sky: Surveillance Satellites in War and Peace*, *Strategic Analysis*, 1983.

1131 Jacob G. Oakley, *Cybersecurity for Space: Protecting the Final Frontier* (Owens Cross Roads: Apress, 2020).

1132 Kubo Macak, "Silent War: Applicability of the Jus in Bello to Military Space Operations," *International Law Studies* 94 (2018): 39.

1133 Frans G. von der Dunk, "Armed Conflicts in Outer Space: Which Law Applies?," *International Law Studies* 97 (2021): 188–231.

1134 Dale Stephens, "International Legal Implications of Military Space Operations", 94 *International Law Studies* 75 (2018),

1135 William H. Boothby, *The Law of Targeting* (Oxford: Oxford University Press, 2012), 359-377; William H. Boothby, *New Technologies and the Law in War and Peace* (New York: Cambridge University Press, 2019).

1136 Melissa de Zwart, "Outer Space", in *New Technologies and the Law in War and Peace*, ed. William H. Boothby (Cambridge: Cambridge University Press, 2019): 337-358.

1137 Duncan Blake, "Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 97–114.

1138 Duncan Blake, "The Law Applicable to Military Strategic Use of Outer Space," in *New Technologies and the Law of Armed Conflict*, ed. Hitoshi Nasu and Robert McLaughlin (Canberra: T. M. C. ASSER PRESS, 2014), 115–140.

1139 Jackson Nyamuya Maogoto, *Technology and the Law on the Use of Force : New Security Challenges in the Twenty First Century* (New York: Routledge, n.d.), 31-53

be atrankos bei nereikalingų kančių sukėlimo draudimo principui. Bill Boothby vienas iš nedaugelio (kartu su Kubo Mačak) nagrinėjo priešpalydovinių ginklų teisinio vertinimo temą.[1140] Michael N. Schmitt sistemiškai, ganėtinai glaustai, aptarė bendras THT taikymo kosminėje erdvėje problemas, kaip antai, kada palydovai atitinka karinio objekto sąvoką, kurie priešpalydoviniai veiksmai atitinka puolimų sąvoką arba kokių iššūkių kyla iš paprotinių THT principų taikymo kosminėje erdvėje.[1141] Jau minėtas Dale Stephens kartu su bendraautore Cassandra Steer analizavo dvigubos paskirties palydovų statusą, antrinių palydovų puolimo padarinių problemą. David Koplow nagrinėjo priešpalydovinius veiksmus paprotinės teisės kontekste.[1142] Robert A. Ramey iš kitų autorių galima išskirti tuo, kad 2000 metais, kuomet ši palydovų puolimo tema nebuvo tokia aktuali, kokia yra dabar, parašė vieną pirmųjų detalių ir visa apimančių straipsnių, kuriame nagrinėjo priešpalydovinius ginklus ir jų atitiktį THT. Jis buvo vienas pirmųjų išskyręs galimus THT ir TKT kolizijų atvejus. Jo tyrimu naudojosi daugelis paskesnių šia tema besidominčių mokslininkų.[1143] Disertacijoje remtasi ir kitų gerai žinomų THT specialistų bendro pobūdžio veikalais, kaip antai, Leslie C. Green,[1144] Yoram Dinstein,[1145] Gary D. Solis,[1146] ir kitais. Tyrimų šia tema Lietuvos mokslininkai neatliko.

Keletą svarbių pastabų būtina pateikti ir apie norminius šaltinius. Pagrindiniu puolimo taisyklių *lex lata* šaltiniu laikytinas IPP, kuris akumuliavo ir atnaujino 1899 ir 1907 Hagos konvencijas, laikytinas pirminiais norminiais kariavimo būdų ir priemonių reguliavimo šaltiniais. Nepaisant to, kad kariavimo būdus ir priemones reguliuoja ne vienas tarptautinės teisės instrumentas, IPP pasirinktas kaip pagrindinis puolimo taisyklių šaltinis dėl šių priežasčių:

1. Tai buvo pirmoji tarptautinė sutartis kodifikavusi ir išaiškinusi svarbiausias puolimo taisykles, įskaitant proporcingumo principą;
2. Nepaisant daugybės XIX a. pab. – XX a. priimtų sutarčių (pavyzdžiui, 1899 ir 1907 m. Hagos konvencijos), nei viena iš jų nebuvo taip plačiai ratifikuota kaip IPP. IPP iki šiol yra detaliausia puolimo taisykles kodifikuojanti tarptautinė sutartis;

1140 Bill Boothby, "Space Weapons and the Law," *International Law Studies* 93 (2017): 179–214.

1141 Michael Schmitt, "International Law and Military Operations in Space," *Max Planck Yearbook of United Nations Law* 10 (2006): 89–125, https://doi.org/10.1163/138946306783559959.

1142 David Koplow, "ASAT-Isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons," *Michigan Journal of International Law* 30 (2008): 1187; Boothby, "Space Weapons and the Law."

1143 Robert A. Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space," *The Air Force Law Review* 48, no. 1 (2000): 157.

1144 Leslie C. Green, *The Contemporary Law of Armed Conflict*, 2nd Ed. (Manchester: Manchester University Press, 2000).

1145 Yoram Dinstein and Arne Willy Dahl, *Oslo Manual on Select Topics of the Law of Armed Conflict. Rules and Commentary* (Tel Aviv: Springer Open, 2020).

1146 Gary D. Solis, *The Law of Armed Conflict. International Humanitarian Law in War* (Cambridge: Cambridge University Press, 2010).

3. 1899 m. ir 1907 m. Hagos konvencijose naudojama ganėtinai bendro pobūdžio terminologija lyginant su IPP nuostatomis;
4. 1899 m. ir 1907 m. Hagos konvencijos yra siauresnės apimties, apimančios tik kelias pagrindines puolimų taisykles, lyginant su IPP;
5. Vykstant 1974 m. diplomatinei konferencijai, kurios metu buvo rengiamas IPP, Tarptautinė kosmoso sutartis ir kiti svarbūs TKT šaltiniai jau galiojo ir suteikė praktinio pagrindo kalbėti apie kosminius karus. 1899 m. ir 1907 m. Hagos konvencijos buvo priimtos gerokai iki kosmoso amžiaus pradžios;
6. Laikoma, kad daugelis puolimo taisyklių įgijo paprotinį pobūdį tik po Niurnbergo teismų. Dėl šios priežasties apsiribojus Hagos konvencijomis, tyrimas nebūtų išsamus, geografiškai nereprezentatyvus, kadangi tik maža dalis valstybių buvo priėmę šiuos instrumentus. Atitinkamai tyrimo praktinė reikšmė būtų menkesnė.

Šiuo tyrimu nesiekiama nei nustatyti, nei ginčyti paprotinę THT. Kadangi valstybių praktika kosminių karų kontekste tik vystosi, sunku spręsti, ar apskritai papročiui susiformuoti yra susidariusios prielaidos. Kiek būtina paprotinė THT šiam tyrimui, remiamasi iki šiol detaliausią tyrimą apie paprotinę THT yra parengusio Tarptautinio raudonojo kryžiaus komiteto (toliau – TRKK)[1147] paprotinės THT studija (toliau – Paprotinės THT studija). Kiek reikia, papildomai remiamasi David Koplow darbu, kuriame buvo analizuotas priešpalydovinių veiksmų ir paprotinės teisės santykis.

Taip pat būtina paaiškinti, kodėl daugiausiai remiamasi tarptautinį ginkluotą konfliktą reguliuojančiais šaltiniais. THT reguliuoja dvejopo pobūdžio ginkluotus konfliktus – tarptautinius, kuriuose (dažniausiai) kovoja dvi ir daugiau valstybės bei netarptautinius, kuriuose bent viena konflikto šalis yra nevalstybinė organizuota asmenų grupė. Kadangi valstybės tikėjosi išlaikyti teisinius instrumentus pažaboti vidinio pobūdžio nusikalstamiems, revoliucinio pobūdžio, ginkluotiems pasipriešinimams ar kitokiems nepaklusniems kariniams judėjimams vidinėje valstybės teritorijoje, rašytinė tarptautinė teisė, reguliuojanti netarptautinio ginkluoto konflikto režimą išliko palyginus skurdi. Be to, netarptautinio ginkluoto konflikto teisinio reguliavimo taikymo slenkstis yra kur kas aukštesnis, nei taikomas tarptautiniams ginkluotiems konfliktams. Dėl šios priežasties netarptautiniai ginkluoti konfliktai kosminėje erdvėje yra mažai tikėtini, nepaisant to, kad didžioji dalis konfliktų šiais laikais yra būtent netarptautinio pobūdžio. Galiausiai, net žinant, kad tarptautinio ir netarptautinio ginkluoto konflikto rašytinio teisinio reguliavimo apimtis ženkliai skiriasi, pagrindinės puolimų taisyklės (karinės būtinybės, atsargumo priemonių ėmimosi, proporcingumo, atskyrimo, puolimų be atrankos draudimo) įgijo paprotinį pobūdį ir lygiavertiškai taikomos tiek tarptautiniuose, tiek netarptautiniuose ginkluotuose konfliktuose.[1148] Dėl abiejų šių THT režimų suartėjimo kiekvieno iš

1147 Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary International Humanitarian Law. Volume I. Rules.* (Cambridge: Cambridge University Press, 2005) and Jean-Marie Henckaerts and Louise Doswald-Beck, *Customary Interantional Humanitarian Law. Volume II: Practice* (Cambridge: Cambridge University Press, 2005).

1148 The ICRC Customary IHL study indicates that most rules are applied to non-international armed conflicts.

jų analizė atskirai nepridėtų daug mokslinės reikšmės šiam darbui, o atskiros temos ar argumentai galimai kartotųsi. Nepaisant to, kad puolimų taisyklės tiek tarptautiniame, tiek netarptautiniame ginkluotame konflikte iš esmės nesiskiria, autoriaus manymu, yra būtina aptarti ir tarptautinio, ir netarptautinio ginkluoto konflikto pradžios slenksčius siekiant visapusiškos analizės ir skaitovui sistemiškai suprasti temą.

Tyrimo naujumas

Nepaisant reikšmingų aukščiau minėtų autorių darbų, autoriaus nuomone, šioje temoje pasigendama gilesnio požiūrio į problemas, susijusias su priešpalydoviniais veiksmais. Pirmiausiai, tyrimai, kuriais siekta išspręsti THT ir TKT potencialų normatyvinį konfliktą, nepasiūlo praktiškų, taktiniame lygmenyje įgyvendinamų sprendimų. Viena vertus, autoriai, tyrę THT ir TKT santykį identifikavo ir analizavo labiausiai matomus norminės trinties atvejus (pavyzdžiui, astronauto-kombatanto statuso problemą), tačiau mažiau matomų neaptarė. Nematant bendro potencialių norminių kolizijų vaizdo, autoriaus manymu, yra sunku pasiūlyti sprendimo modelį, tinkantį visiems atvejams. Be to, nepaisant to, kad pasiūlyti modeliai yra gerai apgalvoti ir pagrįsti, tačiau sunkiai pritaikomi operaciniame ir taktiniame kariniame lygmenyje, kur *lex lata* išmanymas yra būtinas. Autorius įvardija visas galimas THT ir TKT normų kolizijas ir pasiūlo jų sprendimo modelį, kuris gali būti ganėtinai paprastai pritaikomas praktikoje. Naujas pasiūlytas modelis rodo šios disertacijos naujumą ir praktinę reikšmę.

Ganėtinai intensyvūs moksliniai debatai vyksta tarp karo ekspertų ir humanitarinių pažiūrų atstovų dėl to, kaip reikėtų teisiškai traktuoti „minkštąsias“ karines priemones ir ar jos turėtų būti laikomos puolimais. Autorius pasiūlo naujovišką „puolimų“ sąvokos traktavimą pagal THT, kuris gali būti taikomas ir nekinetiniams priešpalydoviniams veiksmams.

Nors dvigubos paskirties palydovų teisinio statuso klausimas periodiškai buvo analizuojamas, daugelis autorių siūlė tokius palydovus traktuoti kaip karinius objektus dėl jų panaudojimo būdo. Tačiau ši tema nėra tokia siaura, kaip gali pasirodyti iš pirmo žvilgsnio. Pavyzdžiui, keltinas klausimas ar kartą kariniais tikslais panaudotas palydovas išlaiko karinio objekto statusą nepertraukiamai, ar kariniams tikslams naudojama palydovo dalis (pavyzdžiui, infraraudonųjų spindulių sensorius) paverčia patį palydovą kariniu objektu, arba ar kartas nuo karto kariniais tikslais panaudojamas palydovas yra karinis objektas. Daugelis temų, kurias analizuoja autorius, nebuvo niekur anksčiau analizuotos, kaip antai, pakaitomis ar nuolat kariniais tikslais naudojamų civilinių palydovų teisinio statuso, nežinomos paskirties palydovų teisinio statuso, palydovų dalių teisinio statuso, kosminės erdvės ir orbitų teisinio statuso analizė.

Dar vienas sudėtingas klausimas – šalutinių palydovo puolimo (ypač kinetinio) padarinių tąsos vertinimas taikant proporcingumo principą. Mokslininkai skatino atsižvelgti ir vertinti galimus šaltinius palydovų puolimo padarinius, tačiau nesvarstė, kaip tiksliai turėtų būti vertinama atsitiktinė žala ir kaip toli turėtų būti numatoma.

Disertacijoje siūloma inovatyviai pažvelgti į naujos ginkluotės teisinio vertinimo pareigą. Nepaisant ganėtinai bendrai suformuluotos pareigos, reikalaujančios valstybėms atlikti naujos ginkluotės teisinį vertinimą, autorius kelia klausimą, ar ši pareiga,

reguliuodama taip pat ir taikos teisinius santykius, gali užkirsti kelią valstybėms atlikti kinetinės priešpalydovinės ginkluotės bandymus.

Šį tyrimą nauju daro ir tai, kad ganėtinai siaura tema apie palydovų puolimą yra analizuojama išsamiai, apjungiant mokslininkų nuomones, valstybių praktiką ir aktualią tarptautinių teismų jurisprudenciją.

Praktinė tyrimo reikšmė

Autoriaus nuomone, tarptautinių sutarčių tinkamas interpretavimas gali išspręsti rašytinio teisinio reguliavimo stoka sukuriamas problemas ir daryti įtaką sprendimų priėmėjams, formuojantiems valstybių praktiką, eventualiai galinčią įgauti tarptautinio papročio formą. Tyrimo rezultatai gali būti naudingi:

1. Kariuomenės teisininkams, teisės patarėjams ir kitiems pareigūnams, patariantiems puolimo sprendimus priimantiems asmenims arba atliekantiems teisinį naujos ginkluotės vertinimą;
2. Rengiant ar keičiant nacionalinius ginkluoto konflikto teisės vadovus;
3. Paskatinti mokslines diskusijas, įskaitant tarp mokslininkų, rengiančių Vumeros vadovą;
4. Rengiant THT studijų programas ir kuriant praktines užduotis studentams.

Tyrimo objektas, tikslai ir hipotezė

Tyrimo objektas – THT puolimo taisyklių taikymas priešpalydoviniams veiksmams.

Tyrimo tikslas – išanalizuoti, kaip *jus in bello* puolimų taisyklės gali būti taikomos priešpalydoviniams veiksmams, identifikuoti iš to kylančias teisines problemas ir pasiūlyti šių problemų sprendimo būdus.

Siekiant pasiekti tyrimo tikslą, keliami šie uždaviniai:

1. apibūdinti santykį tarp THT ir TKT ir pasiūlyti potencialių norminių kolizijų sprendimo būdą;
2. nustatyti, kokiais atvejais palydovai laikytini kariniais objektais;
3. išanalizuoti kosminės erdvės teisinį statusą pagal THT ir nustatyti, kokius teisinius padarinius toks statusas sukelia;
4. išanalizuoti ar kinetinių priešpalydovinių ginklų panaudojimas laikytinas puolimu be atrankos;
5. nustatyti, kaip taikomas proporcingumo principas priešpalydoviniams veiksmams ir iki kokio lygmens reikia vertinti atsitiktinę žalą puolant palydovus;
6. išanalizuoti, ar pareiga atlikti naujos priešpalydovinės ginkluotės teisinį vertinimą apriboja kinetinių priešpalydovinių ginklų bandymus taikos metu.

Tyrimo hipotezė: THT *lex lata* yra pakankama sureguliuoti palydovų puolimą.

Tyrimo metodologija

Tema priklauso socialinių mokslų pakraipai, todėl disertacijoje naudojami šiai pakraipai būdingi tyrimo metodai: analogijos, lyginamosios analizės, dokumentų analizės, teleologinis, istorinis, lingvistinis ir sisteminės analizės.

Analogijos metodas. THT nuostatos kurį laiką buvo traktuojamos kaip *lex specialis* santykiuose su kitomis tarptautinės viešosios teisės šakomis, ypač tarptautine žmogaus teisių teise (toliau – TŽTT). Diskusijos ir argumentai, kurie buvo naudoti nustatant THT ir TŽTT santykį naudojami kaip pagrindas surasti THT ir TKT santykio modelį. Autorius siekia perkelti išsakytą kritiką nustatant THT ir TŽTT santykį į THT ir TKT santykio kontekstą ir pažvelgti ar THT ir TKT santykiui ši kritika yra aktuali ir pritaikoma. Tokiu būdu tikrinamas *lex specialis* kolizinių normų sprendimo technikos pagrįstumas nustatant THT ir TKT santykį.

Lyginamosios analizės metodas taikomas vertinant mokslininkų nuomones ir valstybių *opinio juris* tuo pačiu klausimu. Pavyzdžiui, Talino vadovo rengimo procese paaštrėjęs moksliniai debatai apie puolimo sąvokos apibrėžimą persikėlė iš individualaus mokslinio lygmens iki organizacijų. Argumentai, kurie išreiškia vieną ar kitą poziciją dėl puolimo sąvokos kibernetinės erdvės kontekste, yra lyginami ir perkeliami iš kibernetinės erdvė į kosminės erdvės kontekstą. Lyginamosios analizės metodo pagalba taip pat identifikuojama *opinio juris* analizuojant nacionalinius ginkluoto konflikto teisės vadovus, lyginant valstybių pozicijas, kaip jos traktuoja dvigubos paskirties palydovus ar kaip vertina atsitiktinę žalą taikydamos proporcingumo principą.

Dokumentų analizės metodas taikomas įvairiuose kontekstuose – ypač siekiant atskleisti sąvokų reikšmes. Pavyzdžiui, 1974-1977 Diplomatinės konferencijos dėl tarptautinės humanitarinės teisės taikomos ginkluotiems konfliktams pakartotinio patvirtinimo ir plėtros (toliau – CDDH) *travaux préparatoires* padėjo atskleisti API rengėjų ketinimus dėl atitinkamų API nuostatų taikymo, pavyzdžiui, pareigos atlikti naujos ginkluotės teisinį vertinimą arba API taikymo sąlygų kosminėje erdvėje.

Teleologinis metodas. CDDH oficiali medžiaga naudinga siekiant atskleisti API kūrėjų ketinimus ir atitinkamai interpretuoti specifines taisykles. Pavyzdžiui, analizuojant THT taikymo aplinkos atžvilgiu ypatybes, disertacijos autorius ieškojo CDDH dalyvių pasisakymų ir nuomonių apie API galimą taikymą kosminėje erdvėje arba kituose potencialiuose kovos laukuose. Be to, šio metodo pagalba buvo atskleistas API 36 straipsniu įtvirtintos pareigos tikslas.

Lingvistinis metodas naudojamas paaiškinti bendrines sąvokas, kurių norminiai šaltiniai kitaip neapibrėžia. Pavyzdžiui, siekiant nustatyti JAV karinio objekto sąvokos traktuotę, buvo ieškoma įprastinių žodžių „sunaikinimas“ (angl. *destruction*) ir „neutralizavimas“ (angl. *neutralization*) reikšmių. Kitame kontekste, lingvistinis metodas padėjo svarstant klausimą, ar kosminė erdvė patenka į gamtinės aplinkos apibrėžimą, kaip jis suprantamas pagal *jus in bello*. Be to, šis metodas padėjo atskleisti tokias sąvokas kaip „tikėtina atsitiktinė žala“ (angl. *expected collateral damage*) arba kurie priešpalydoviniai veiksmai laikytini veiksmais be atrankos (angl. *indiscriminate*).

Sisteminės analizės metodas yra vienas pagrindinių naudotų metodų šioje disertacijoje. Priešpalydoviniai veiksmai nėra specialiai reguliuojami THT. Ši aplinkybė kelia nemažai teisinių iššūkių, susijusių su dabartiniais veiksmais ir hipotetiniais ateityje galimai vyksiančiais veiksmais. Daugelyje skyrių remiamasi norminiais tekstais, jurisprudencija, *opinio juris,* valstybių praktika ir mokslininkų nuomonėmis. Teiginiai išsakyti šiuose šaltiniuose neretai vienas kitam prieštarauja, todėl išvados neretai

yra ganėtinai sunkiai konstruotinos. Sisteminės analizės metodas leidžia identifikuoti bendrą šių prieštarų vardiklį ir suformuluoti atitinkamas išvadas. Pavyzdžiui, nagrinėjant potencialaus santykio tarp THT ir TKT problemą, autorius turėjo ne tik išanalizuoti aktualius kolizijų sprendimo mechanizmus, tačiau ir analizuoti kaip šie mechanizmai buvo taikyti jurisprudencijoje, kaip kito jų taikymas, kokios to priežastys, kaip šiuos mechanizmus vertino mokslininkai, kokius argumentus pateikė ir ar tie argumentai vis dar gali būti pritaikyti THT ir TKT kontekste. Kitu atveju, analizuojant vieną iš pagrindinių THT principų – karinės būtinybės principą – pastebėta, kad šis principas nėra apibrėžtas norminiuose tekstuose, tačiau kelis kartus paminimas. Jei būtų apsiribota vien tik norminiais šaltiniais, tikėtina, karinės būtinybės principas būtų netinkamai interpretuotas, kadangi norminiuose šaltiniuose jis minimas tik išimties iš taisyklės kontekstuose. Atsižvelgiant į tai, norint suprasti THT terminiją, būtina paanalizuoti terminų kilmę, *opinio juris*, mokslininkų nuomonę ir praktinį šių terminų taikymą tarptautiniuose teismuose. Tik visapusiškai išanalizavus terminų reikšmes galima šiuos terminus įsprausti į priešpalydovinių veiksmų kontekstą. Todėl siekiant tinkamai išaiškinti daugelį aktualių THT naudojamų terminų, yra būtina sistemiškai pažvelgti į skirtingus terminų vartojimo kontekstus, kadangi neretai pasitaiko, kad norminiuose teisės šaltiniuose sąvokos visapusiškai nėra atskleidžiamos.

Istorinis metodas. Kaip jau pastebėta, šio metodo taikymas padėjo išaiškinti pagrindinių THT principų reikšmę, kuri kito evoliucionuojant tarptautinės teisės instrumentams. Pavyzdžiui, istorinės analizės metodas padėjo atskleisti tai, kad atskyrimo principas pirmiausiai radosi kaip principas, saugantis konflikte nedalyvaujančius žmones ir tik po 1977 metų į jo turinį buvo įtraukti ir civiliniai objektai, t.y. tik po 1977 metų tarptautinės sutarties lygmeniu civiliniai objektai pradėti saugoti.

Disertacijos struktūra

Disertacija suskirstyta į keturias temines dalis skyriais.

Pirmajame skyriuje analizuojamos THT taikymo kosminėje erdvėje galimybės ir THT ir TKT santykis. Ši analizė būtina, kadangi tarp kai kurių TKT ir THT normų ginkluoto konflikto metu potencialiai gali kilti kolizija. Be šios analizės daugelis kitų analizuojamų teisinių problemų būtų hipotetinės, stokotų praktinio reikšmingumo.

Antrajame skyriuje siekiama nustatyti, kokiomis sąlygomis palydovai gali būti laikomi kariniais arba civiliniais objektais, taip pat koks yra kosminės erdvės statusas, kuris atitinkamai gali lemti palydovų statusą. Šio skyriaus pavadinime naudojama „puolamumo“ (angl. *targetability*) sąvoka siekiant pabrėžti pirminę puolimo stadiją – taikinio identifikavimą – ir atskirti ją nuo puolimo principų.

Trečiajame skyriuje analizuojami bendrieji puolimo principai: karinės būtinybės, atsarginių priemonių ėmimosi, nereikalingų kančių draudimo ir proporcingumo. Šie principai pristatomi ne tik pozityvistiniu požiūriu, tačiau ir istoriniu siekiant tinkamai suprasti ir taikyti šiuos principus.

Ketvirtajame skyriuje analizuojama pareiga atlikti naujos priešpalydovinės ginkluotės teisinį vertinimą ir kaip ši pareiga suvaržo valstybių veiksmus ruošiantis palydovo puolimui.

IŠVADOS

Tyrimo rezultatai rodo, kad galiojanti norminė *jus in bello,* įskaitant puolimų taisykles, gali būti taikoma karinėms operacijoms kosmose. Nepaisant to, kad kai kurių taisyklių taikymas sukelia praktinių sunkumų dėl sudėtingų sąlygų kosminėje erdvėje, tyrimas parodė, kad visos puolimų taisyklės gali būti taikomos palydovų puolimų atžvilgiu, o kai kurios iš jų net lengviau įgyvendinamos nei puolimų žemėje atveju. Atitinkamai galima teigti, kad suformuluota hipotezė pasitvirtino, o tai liudija šios išvados:

1. TKT normos, susijusios su karinės jėgos naudojimu kosminėje erdvėje, turėtų būti taikomos kaip *lex specialis* konflikto su atitinkamomis THT normomis atveju. Visais kitais atvejais, t.y. kai TKT nereguliuoja karinių veiksmų kosminėje erdvėje, turėtų būti taikomos THT normos, kaip *lex specialis,* reguliuojančios ginkluotos kovos veiksmus kosminėje erdvėje. Nepaisant to, atitinkamos karinių veiksmų kosminėje erdvėje nereguliuojančios TKT normos taikytinos ir ginkluoto konflikto metu, tačiau tik tol, kol neprieštarauja THT atitinkamoms normoms.
2. THT taikoma vykdant karines kosmoso operacijas. Puolimų taisyklės taikomos kinetiniams priešpalydoviniams puolimams. Nekinetinius priešpalydovinius veiksmus THT reguliuoja tuomet, kai šiais veiksmais siekiama sutrikdyti oponento karinius veiksmus ir galima numatyti, kad šiais veiksmais bus neutralizuotas, užimtas arba sugadintas oponento karinis objektas arba atliekant tokius veiksmus iškils grėsmė civilių sveikatai ar gyvybei arba bus sugadinti arba sunaikinti civiliniai objektai.
3. Palydovai, kurie neprisideda prie karo veiksmų arba nėra aišku, ar jie prisideda prie karo veiksmų, nėra kariniai objektai. Nebeveikiantys ar nepataisomi palydovai, net jei jie priklauso kariuomenei (pavyzdžiui, kariniai žvalgybiniai palydovai), nėra kariniai objektai, kadangi jie neprisideda prie karo veiksmų. Palydovai, kurių karinės pajėgos nenaudoja, nelaikomi kariniais objektais, kadangi jie neprisideda prie karo veiksmų.
4. Privatiems subjektams priklausantys palydovai yra civiliniai objektai, nebent jie atitinka karinio objekto sąvoką. Karo pramonę remianti veikla nėra laikoma prisidėjimu prie karinių veiksmų, todėl šioje veikloje naudojami objektai, nelaikytini kariniais objektais. Mokesčiai, kuriuos sumoka į valstybės biudžetą privačios kosmines technologijas vystančios kompanijos, net jei jie perskirstomi išskirtinai kariniam biudžetui, nesukuria prielaidų manyti, kad mokesčių mokėtojas ar jam priklausantys objektai (įskaitant palydovus) yra kariniai objektai, kadangi karinius objektus apibrėžia karinė, o ne finansinė vertė.
5. Palydovai laikytini kariniais objektais tuomet, kai jie priklauso ginkluotosioms pajėgoms, kai juos naudoja ginkluotosios pajėgos arba juos planuoja panaudoti ginkluotosios pajėgos. Kadangi sunku nustatyti, ar ateityje planuojama palydovą panaudoti kariniais tikslais, valstybės turėtų vertinti žvalgybinę informaciją deramai atsakingai (angl. *due diligence*) ir pulti palydovą tik tuomet, kai pakanka žvalgybinių duomenų konstatuoti, kad palydovas bus panaudotas kariniais tikslais.

Jei duomenų nepakanka, turi būti ieškoma papildomų duomenų. Palydovas negali būti puolamas vien tik dėl karinio potencialo ateityje būti panaudotu kariniais tikslais. Karinis potencialas turi būti tikras ir rodyti tikėtiną arba galimą panaudojimą ateityje kariniais tikslais. Palydovas, laikytinas kariniu objektu, automatiškai nepaverčia visos palydovų konsteliacijos kariniu objektu. Kiekvienas taikinys individualiai turi atitikti karinio objekto sąvoką.

6. Palydovo puolimas turi suteikti aiškų karinį pranašumą. Puolančiajam turi būti aiškūs palydovo puolimo padariniai ir kaip tie padariniai atliepia karinį pranašumą. Puolantysis privalo žinoti ne tik bendrąsias palydovo charakteristikas, tačiau ir tikėtinus padarinius, atsirasiančius po palydovo sunaikinimo, neutralizavimo ar užėmimo.
7. Alternatyviai naudojami palydovai yra kariniai objektai nuo to momento, kai jie yra naudojami kariniais tikslais. Kadangi yra sudėtinga nustatyti signalų naudojimo tikslų laiką ir recipientą, palydovo karinio panaudojimo tendencija (angl. *pattern*) yra svarbi vertinant palydovo statusą. Jei palydovas tendencingai kartas nuo karto yra panaudojamas kariniais tikslais ir toks tendencingas panaudojimas suponuoja tikimybę, kad ateityje palydovas bus vėl panaudotas kariniais tikslais, jis išlaiko karinio objekto statusą. Tačiau palydovo tendencingas panaudojimas kariniais tikslais turi būti paremtas patikimais duomenimis. Šiuo atveju, visi alternatyviai ginkluotųjų pajėgų ir civilių naudojami palydovai yra kariniai objektai pagal „paskirties“ kriterijų. Kita vertus, kuomet civilinio palydovo panaudojimas kariniais tikslais nerodo tendencijos (pavyzdžiui, orų palydovų atveju) jie laikytini kariniais objektais tik karinio naudojimo metu, nebent būtų gauta duomenų apie jų tikėtiną panaudojimą ateityje.
8. Nuolat kariniais ir civiliniais tikslais naudojami palydovai yra kariniai objektai. Palydovai, turintys atskiriamas karines ir civilines dalis neturėtų būti laikomi kariniais objektais, nebent neįmanoma palydovų traktuoti kitaip. Puolimo priemonės (pavyzdžiui, priešpalydoviniai lazeriai) nelemia palydovo teisinio statuso. Nežinomos paskirties palydovai yra civiliniai objektai, nebent atitinka karinio objekto sąvoką. Priartėjimo operacijas (pranc. *rendezvous*) atliekantys palydovai turėtų būti preziumuojami kaip civiliniai objektai, nebent kelia realią grėsmę kitiems įrenginiams, pavyzdžiui, blokuoja signalus arba prisiartina taip arti, kad jo karinis panaudojimas tampa akivaizdus protingam asmeniui.
9. Palydovo karinio panaudojimo dažnumas *ipso facto* nelemia jo karinio objekto statuso, antraip jis būtų preziumuojamas, kaip karinis objektas, o THT įtvirtina priešingą civilinio objekto prezumpciją. Kiekvienas palydovas gali būti puolamas tik tuo atveju, jei yra pakankamai duomenų laikyti palydovą kariniu objektu. Laiko tėkmėje palydovai gali keisti statusą iš karinio į civilinį, išskyrus atvejus, kuomet jie yra kariniai objektai pagal „pobūdžio“ kriterijų. Veikiantys ginkluotosioms pajėgoms priklausantys palydovai yra kariniai objektai pagal pobūdį, jų statusas nesikeičia.
10. Kosminė erdvė yra gamtinė aplinka puolimo taisyklių kontekste. Kosminė erdvė turėtų būti laikoma civiliniu objektu ir, pirmiausiai, negali būti tiesiogiai puolama.

Antra, jei puolamas karinis objektas, turi būti apsvarstyta galima atsitiktinė žala kosminei erdvei. Kosmoso šiukšlių sukėlimas yra žala gamtinei aplinkai puolimo taisyklių požiūriu. Jokie palydovai, net karinio objekto sąvoką atitinkantys, negali būti puolami, jei yra tikėtina, kad dėl puolimo kosminėje erdvėje plačiai pasklis šiukšlės, jos ilgai nesudegs atmosferoje ir padarys rimtos žalos kosminei erdvei.

11. Nereikalingų kančių draudimo principas taikytinas palydovų puolimų atveju, kadangi gali būti pažeistas netiesiogiai, atsitiktinės žalos po palydovo puolimo atveju. Šiuo metu žinomos priešpalydovinės technologijos praktiškai sunkiai gali sukelti nereikalingas kančias, kadangi nereikalingų kančių (kaip teisinei kategorijai) sukėlimui yra nustatyta aukšta žalos kartelė.
12. Atsargumo priemonių taisyklės reikalauja patvirtinti, o ne nuspėti taikinio statusą. Neprivaloma pavirtinti puolimo objekto, kaip karinio, 100 procentų tikimybe, tačiau būtina tai daryti deramai atsakingai (angl. *due dilligence*) ir panaudojant visas prieinamas informacijos rinkimo priemones.
13. Puolimas, kurio metu nėra taikomasi į karinį ar civilinį objektą, pavyzdžiui, neproporcingai didelės galios sprogstamojo užtaiso panaudojimas kosminėje erdvėje siekiant pakenkti keliems palydovams sprogimo bangos spindulyje, arba signalų blokavimo priemonių panaudojimas, kuomet blokuojami ne vieno palydovo, o kelių aplinkui esančių palydovų signalai, yra draustinas, nes laikytinas puolimu be atrankos.
14. Proporcingumo principas reikalauja atsitiktinę žalą įvertinti prieš palydovo puolimą. Besitęsianti puolimo žala (angl. *reverberating effect*) turi būti įvertinama tol, kol yra numatoma remiantis protingo žmogaus (angl. *reasonable person*) standartu. Atsitiktinės žalos numatymas reikalauja ne tik bendrų žinių ar puolimo planuotojo įsitikinimų, tačiau ir kitų turimų priemonių panaudojimo, pavyzdžiui, atitinkamų ekspertų skaičiavimų. Jei besitęsianti puolimo žala nebegali būti protingai numatoma, tai nereiškia, kad visi nenumatomi padariniai leistini. Kuomet neįmanoma nuspėti galimos palydovo puolimu sukeltinos atsitiktinės žalos, toks puolimas laikytinas puolimu be atrankos.
15. Priežastinį ryšį tarp puolėjo priešpalydovinių veiksmų ir potencialios atsitiktinės žalos būtina nustatyti. Užpultosios arba trečiosios šalies veiksmai neturi daryti įtakos potencialios atsitiktinės žalos vertinimui. Trečiosios šalies įsitraukimas arba atsitiktinės žalos išliekamieji padariniai nekeičia proporcingumo turinio ir nešvelnina atsakomybės sąlygų. Valstybė, planuojanti pulti palydovą negali tikėtis iš trečiosios šalies sumažinti atsitiktinę žalą, pavyzdžiui, sutaisant sugadintą palydovą. Lygiai taip pat puolančioji šalis negali atsisakyti vertinti žalą, kuri nuspėjama, kad atsiras, tik ilgalaikėje perspektyvoje.
16. Priešpalydovinių ginklų bandymus taikos metu riboja naujos ginkluotės teisinio vertinimo pareiga. Teisinis vertinimas turi būti atliekamas kiek įmanoma ankstesnėje ginklo plėtojimo stadijoje, pavyzdžiui, kuriamo ginklo analizės stadijoje. Jei atliktus teisinį naujos ginkluotės vertinimą nustatoma, kad tokio ginklo panaudojimas ginkluoto konflikto metu prieštarautų valstybės tarptautiniams įsipareigojimams, toks ginklas neturėtų toliau būti vystomas ir bandomas.

REKOMENDACIJOS

1. Rekomenduojama priešpalydovinius veiksmus laikyti puolimais kai:
   1.1. galima numatyti, kad puolamasis palydovas patirs neigiamus fizinius padarinius, pavyzdžiui, bus sunaikintas;
   1.2. §galima numatyti, kad palydovo valdytojas praras palydovo valdymą dėl puolimo;
   1.3. galima numatyti, kad palydovas patirs atstatomos žalos ir dėl to bus laikinai neutralizuotas;
   1.4. palydovas taip pat yra naudojamas civilių ar civilinės infrastruktūros, ypač kai priešpalydovine veikla, tikėtina, bus sužeisti ar žus civiliai, bus sugadinti ar sunaikinti civiliniai objektai.
2. Siekiant išvengti rizikos pažeisti proporcingumo principą, jei leidžia galimybės, naudoti nekinetines priešpalydovines priemones, kuriomis galima pasiekti analogišką karinį pranašumą kaip ir naudojant kinetines priešpalydovines priemones.
3. Siekiant tinkamai laikytis atsargumo priemonių, nedviprasmiškai ir efektyviai iš anksto įspėti civilius apie būsimą palydovo puolimą, ypač jei puolamas GNSS ar kitokio pobūdžio konsteliacijos palydovas, kurio signalais plačiai naudojasi civiliai, išskyrus atvejus, kai toks įspėjimas apsunkina galimybę pasiekti karinių tikslų.
4. Kai galima pasiekti analogišką karinį pranašumą puolant palydovų valdymo stotis žemėje ir atsitiktinė žala šiuo puolimu nebūtų didesnė, nei puolant palydovą tiesiogiai, palydovų valdymo stotis žemėje turėtų būti puolama, kad būtų išvengta karinės būtinybės ir proporcingumo principų pažeidimų.
5. Jei naudojantis turima informacija negalima nustatyti, kad palydovas yra karinis objektas, būtina surinkti papildomos informacijos. Jei papildomos informacijos gauti negalima arba ja negalima patvirtinti tikėtinos palydovo karinės paskirties, palydovas turi būti preziumuojamas kaip civilinis objektas.
6. Kai leidžia aplinkybės, patartina tinkamai pasirikti palydovo puolimo laiką ir vietą. Puolant palydovą naktį arba virš teritorijos, kurioje yra mažiau nei įprastai palydovo signalų recipientų (pvz., atvirojoje jūroje), tikimybė pažeisti proporcingumo principą sukeliant neproporcingą atsitiktinę žalą sumažėja.
7. Vertinant karinį pranašumą patartina remtis šiais pasiūlymais:
   7.1. jei vykdomi keli puolimai, sudarantys dalį karinės operacijos, karinio pranašumo vertinimas turėtų apimti vieno tipo puolimus, jei neįmanoma įvertinti kiekvieno puolimo karinio pranašumo;
   7.2. jei vieno tipo puolimų metu atsitiktinės žalos rizika civiliams ir civiliniams objektams skiriasi, kiekvienas puolimas turėtų būti vertinamas atskirai;
   7.3. karinis pranašumas gali būti vertinamas tik tuomet, kai yra numatomas, atitinkamai, puolimai, neteikiantys numatomo karinio pranašumo neturėtų būti vykdomi;
   7.4. vykdant bet kokį puolimą, būtina kiek įmanoma labiau atsižvelgti į civilių ir civilinių objektų apsaugą.

8. Palydovų puolimus planuojantys asmenys turėtų naudotis visomis turimomis priemonėmis, įskaitant inžinierių ar kitų ekspertų pagalba, siekiant įvertinti galimą atsitiktinę žalą, kaip to reikalauja proporcingumo principas.
9. Puolančiajai pusei rekomenduotina atsižvelgti į toliau išvardintas aplinkybes prieš puolant palydovą:
   9.1. palydovo aukštį nuo žemės paviršiaus;
   9.2. galimą kosmoso šiukšlių kiekį po puolimo;
   9.3. galimą kosmoso šiukšlių išsidėstymą orbitose po puolimo;
   9.4. preliminarų laiką, kurio prireiks kosmoso šiukšlėms pasiekti atmosferą;
   9.5. kitų palydovų nei puolamasis skaičių orbitoje;
   9.6. puolamojo palydovo signalų svarbą civilinėms technologijoms Žemėje;
   9.7. numatomą civilių sužalojimų ar mirčių skaičių ir sugadintų ar sunaikintų civilinių objektų skaičių dėl prarastų puolamo palydovo signalų.
10. Rekomenduotina nepulti GNSS palydovų dėl nenuspėjamos, neapskaičiuojamos ir sunkiai įvertinamos atsitiktinės žalos masto, kadangi proporcingumo principas draudžia puolimus, kurių atsitiktinės žalos įvertinti neįmanoma.
11. Rekomenduotina laikytis padariniais grįsto požiūrio vertinant, ar priešpalydovinei veiklai turi būti taikomos puolimų taisyklės. Jei tokia veikla, tikėtina, neigiamai paveiks civilius ir civilinius objektus, ji turi būti atliekama laikantis puolimų taisyklių.
12. Atliekant priešpalydovinių ginklų teisinį vertinimą, valstybės turėtų apsvarstyti, ar priešpalydovinio ginklo panaudojimas gali sukelti kosmoso šiukšlių ir, jeigu gali, įvertinti jų galimą kiekį, paplitimą orbitoje ir laiką iki sugrįžimo į atmosferą.

Marozas, Tomas

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The thesis "Satellite Targeting under Jus in Bello" seeks to research the existing targeting rules and find ways of their application for military space operations. To achieve this goal, research is steered in three dimensions: firstly, the question of jus in bello applicability in outer space is scrutinized, secondly, rules of targeting analysed with specific focus on satellite attacks and, thirdly, jus in bello obligation to review new weapons is analysed to stretch the analysis to peacetime conduct and question whether this duty applies to ASAT weapon testing and what legal implications flow from it. While searching for ways to apply jus in bello for military space operations, the Author analyses whether general jus in bello application conditions may be met in outer space and seeks to identify the potential conflicting rules of IHL and ISL and proposes their resolution mechanism. In the second chapter, the Author discusses the legal notion of military objective and seeks to identify which satellites fall under that legal notion and become targetable. Specific effort is given to analyse the status of dual-use technologies, as most satellites are of this nature and the status of outer space under jus in bello. In the same chapter, the Author suggests to generally treat natural environment as a civilian object and apply jus in bello natural environment preservation rules only when natural environment constitutes military objective or may face collateral effects of satellite attacks. The third chapter discusses general targeting principles, as for instance, military necessity, unnecessary suffering, distinction and proportionality. Major characteristics of those principles are established through historical source analysis, opinio juris, jurisprudence of international courts and doctrine. In the aftermath of disclosure of these principles, it is contemplated how they apply to satellite targeting. The last part of research aims to check whether jus in bello rules specifically designed to operate during armed conflict might penetrate to regulating peacetime conduct in the form of legal weapon review duty. The Author suggests that this duty requires the states to halt weapon testing procedures as soon as negative legal review is drafted. Consequently, as the Author sees kinetic ASAT attacks to have most chances of breaching jus in bello rules during an armed conflict, it is suggested that the prudent implementation of this rule could prevent peacetime kinetic ASAT weapon tests.

Disertacijoje „Palydovai kaip taikiniai pagal jus in bello" siekiama ištirti galiojančias puolimų taisykles ir atrasti būdus, kaip jos galėtų būti taikomos karinėms operacijoms kosmose. Siekiant šio tikslo, tyrimas kreipiamas trimis dimensijomis: pirma, analizuojama jus in bello taikymo kosmoso erdvėje galimybė, antra, analizuojamos puolimų taisyklės ir kiek jos gali būti pritaikomos puolant palydovus, trečia, analizuojama pareiga atlikti teisinį naujos ginkluotės vertinimą ir siekiama nustatyti, ar ši pareiga taikoma priešpalydovinės ginkluotės bandymams ir kokias teisines pasekmes tai gali sukelti. Siekiant nustatyti jus in bello taikymo kosmoso erdvėje galimybes, analizuojama, ar bendrosios jus in bello taikymo sąlygos gali būti pritaikomos kosminei erdvei, kaip galimam karo veiksmų teatrui, taip pat siekiama identifikuoti galimus tarptautinės kosmoso teisės ir tarptautinės humanitarinės teisės normų kolizijų atvejus ir pasiūlyti šių kolizijų sprendimo mechanizmą. Autorius siūlo taikyti praktikoje įtvirtintą lex specialis normų kolizijų sprendimo techniką bei traktuoti tarptautinės kosmoso teisės normas, reguliuojančias karinius veiksmus kosminėje erdvėje, kaip lex specialis lyginant su bendresnėmis jus in bello normomis. Visas kitas tarptautinės kosmoso

teisės normas siūlytina traktuoti kaip lex generalis, o jus in bello taisykles specialiomis, skirtomis reguliuoti valstybių santykius vedant ginkluotos kovos veiksmus. Antroji disertacijos dalis yra esminė ir ją sudarė du skyriai, analizuojantys palydovų puolamumo ir puolimų principų taikymo priešpalydoviniams veiksmams klausimus. Siekiant nustatyti, palydovų puolamumo pagal jus in bello teisines galimybes, analizuojama karinio objekto sąvoka. Turint omenyje tai, kad daugelis palydovų yra naudojami civiliniais ir kariniais tikslais, ypatingas dėmesys skiriamas dvigubos paskirties technologijų teisinės apsaugos analizei. Autoriaus siūlymu, ne visus dvigubos paskirties palydovus derėtų traktuoti kariniais objektais, ypač tuos, kurie nėra nuolat naudojami kariniais tikslais arba kurių paskirtis nėra žinoma. Taip pat analizuojamas gamtinės aplinkos teisinės apsaugos režimas. Autorius siūlo kosminę erdvę traktuoti kaip gamtinę aplinką ir priskirti civiliniams objektams taikomą apsaugą, o konkrečias jus in bello gamtinės aplinkos apsaugai skirtas normas taikyti tik tuomet, kai gamtinė aplinka prilygsta kariniam objektui arba vertinant būsimo puolimo proporcingumą. Trečiajame skyriuje analizuojami puolimų principai, kaip antai, karinės būtinybės, nereikalingų kančių draudimo, atskyrimo ir proporcingumo. Esminiai šių principų bruožai atskleidžiami remiantis istorine analize, opinio juris, tarptautinių teismų praktika bei doktrina. Nustačius šių principų turinį, svarstomos šių principų taikymo puolant palydovus išraiškos ir ribos. Paskutiniojoje disertacijos dalyje siekiama nustatyti, ar jus in bello, kaip ginkluoto konflikto sąlygomis taikoma teisės šaka, gali prasiskverbti į taikos meto valstybių santykių reguliavimą taikant pareigą atlikti teisinį naujos ginkluotės vertinimą. Autoriaus siūlymu, ši pareiga reikalauja stabdyti naujos ginkluotės bandymą iš karto po to, kai gaunama neigiama ginkluotės teisinė išvada. Atsižvelgiant į tai, kad kinetiniai priešpalydoviniai ginklai daugeliu atvejų pažeistų jus in bello normas ginkluoto konflikto metu, autoriaus teigimu, skrupulingas šios pareigos vykdymas reikalauja neatlikti kinetinės priešpalydovinės ginkluotės bandymų.

Tomas Marozas
SATELLITE TARGETING UNDER *JUS IN BELLO*

Daktaro disertacija
Socialiniai mokslai, teisė (S 001)

Mykolo Romerio universitetas
Ateities g. 20, Vilnius
Puslapis internete www.mruni.eu
El. Paštas roffice@mruni.eu

Tiražas 20 egz.

Parengė spaudai Aurelija Sukackė

Spausdino UAB „Šiaulių spaustuvė“
P. Lukšio g. 9G, 76200 Šiauliai
El. P. info@dailu.lt
http://siauliuspaustuve.lt