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Autonomous Weapon System and International Space Law

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ABSTRACT

This paper primarily concerns itself with an analysis of the present outer space laws for regulating the Autonomous Weapon System and the potential gaps that need to be covered with adequate legal instruments.

The normative structure of outer space law to the use and deployment of the Autonomous Weapon System or AWS in outer space; next it shall highlight the inadequacies in the present legal regime. The paper essentially concludes that the regulation of AWS in outer space is possible through the existing general international law/UN Charter and international space law. The re-interpretation of Article 2.4/51 of the UN Charter coupled with an effective interpretation of International Humanitarian Law can bring possible coherence to the international space law regime as it exists today. Such rational interpretation could certainly be a solution for better management of AWS in outer space. And can create an efficacious legal regime for the future.

Keywords: *Autonomous Weapon System, Space Law, Use of Force, UN Charter.*

I. INTRODUCTION

Space technology as a vertical in the development index of a country has assumed great importance in the recent past. With an increasing number of countries investing efforts to create, develop, even import the latest technologies in order to stay ahead in the Outer Space realm, it is no surprise that, the apprehensions of having a ‘space war’ have also increased. Considering the rate of technology development and the attitude of the states that have state-of-the-art space-based technologies, it does seem that space warfare, in the near future is quite likely. Scholars like Lipson and Katzenbach seem to have foretold this as early as 1961 when they mentioned that, “Virtually every activity in space has a possible military connotation; military and nonmilitary uses are extraordinarily interdependent.”³

Today, states cannot imagine modern warfare without space capabilities.⁴ While we have never

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³ Leon Lipson & Nicholas de B. Katzenbach, The Law of Outer Space, in LEGAL PROBLEMS OF SPACE EXPLORATION: A SYMPOSIUM 806 (Legislative Reference Service, Library of Congress ed., 1961).

⁴ JAMES CLAY MOLTZ, CROWDED ORBITS: CONFLICT AND COOPERATION IN SPACE 121–46 (2014).

witnessed space warfare, dual-use satellites in space provide many technological advantages to the military. The military global-positioning systems, space-based aspects of Anti-ballistic missile systems, military reconnaissance satellites, and remote-sensing satellites are already being used in outer space.⁵

Moreover, it is likely that soon, land-based as targets may be neutralized from orbits,⁶ and outer space may be used to “enhance combat effectiveness, reduce casualties, and minimize equipment loss.”⁷ It is apprehended that⁸ considering the indispensable strategic value of space, in future wars would be won or lost based on the destruction of space technologies itself, making terrestrial warfare highly unlikely. Thus, while the extent of militarization of space is now limited to assisting the military through dual-use satellites providing information, it is anticipated that the weaponization of space may eventually see it become the battleground for warfare.

Indeed, there is a strong probability that the Autonomous Weapon System (AWS) will inevitably be used in the outer space arena as well. An Autonomous Weapon System (AWS) is one that once activated, can select and engage targets without further intervention by a human operator.⁹ Scholar Rebecca Crotoof¹⁰ has observed that the use of autonomous Weapon Systems in space may also become favored since there is less risk to civilian objects and space is a hostile environment for human beings. Accordingly, she concluded that like the High Seas, outer space is a fertile ground for the proliferation of AWS.

While her observations are likely to come true, they must not let them guide the “ceiling” of the laws regulating the AWS. It is important to recognize the dangerous nature of outer space and to consider the possible risks and dangers that can be caused by using an autonomous Weapon System in outer space or increasing the weaponization of space in such a widespread manner. This may even have devastating consequences that we are not in the position or capability to control. Thus, this consideration must lead to a “Cautionary” approach while regulating AWS. Whilst space may be the most preferred location for AWS, such space-based

⁵ Shackelford, J. S. (2009). From Nuclear War to Net War: Analogizing Cyber Attacks in International Law, *Berkley Journal of International Law*, 27, 192–251.

⁶Sirohi, M.N. (2016), *Military Space Force and Modern Defense*. Vij Books India Pvt. Ltd.

⁷ Todd Barnet, United States National Space Policy, 2006 & 2010, 23 FLA. J. INT'L L. 277, 279 (2011).

⁸Van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

⁹Horowitz, M.C., 2016. The Ethics & Morality of Robotic Warfare: Assessing the Debate over Autonomous Weapons. *Daedalus*, 145(4), pp.25-36.

¹⁰Crotoof, R., 2015. The Varied Law of Autonomous Weapon Systems. *NATO ALLIED COMMAND TRANSFORMATION, AUTONOMOUS SYSTEMS: ISSUES FOR DEFENCE POLICY MAKERS* (Andrew Williams & Paul Scharre, eds.)(2015, Forthcoming).

technology must be balanced against the legal, logistical and practical limitations associated with that environment.¹¹ With adequate technology and transportation facilities, states can exploit the infinity of space.¹²

Patrick Van Esch, *et al*,¹³ have observed some disturbing repercussions that may ensue from the use of Autonomous weapons in space. While he notes that civilian safety must be the primary objective while deploying autonomous Weapon Systems in space,¹⁴ the concerns also relate to new challenges to legal systems that are not familiar with a borderless environment.¹⁵ The loss will be greater than in other environments, considering the lack of atmosphere, the environment characterized by ‘Drag and lift and blasts’, and the vast distances.¹⁶ Even though there may not be a blast effect, any radiation in space has the capability to spread endlessly in the space void. Thus, it will make these extrapolates the main kill instrument rather than the explosion itself.¹⁷ Moreover, the AWS can be used as directed weapons that would have a killing capacity over vast ranges and at the speed of light due to the absence of atmospheric drag in outer space.¹⁸ Thus, the increased kinetic energy will increase the killing capacity making it capable of destroying both airborne and surface targets.¹⁹

This also poses problems such as asymmetrical warfare. This is because the state that is the most technologically advanced and has the maximum resources will be able to have more power, control, and ability to survive long periods in outer space.²⁰ Thus, battles will be won and lost with a favorable tilt towards the balance of power.²¹ Also, though the use of AWS guarantees minimized impact on military personnel, the same is not extinguished.

¹¹ Tsipis, K. (1981), Laser Weapons, *Scientific American*, 51-57.

¹²van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

¹³van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

¹⁴ Finn, L. R & Wright, D. (2012). Unmanned aircraft systems: Surveillance, ethics and privacy in civil applications, *Computer Law & Security Review*, 28, 184–194.

¹⁵Coteanu, C. (2005). *Cyber Consumer Law and Unfair Trading Practices*, Ashgate Publishing Limited; Saxby, S. (2007), *Book Reviews: Cyber law*, *Computer Law & Security Report*, 23, 86–87.

¹⁶Hanifen, W. D & Kuller, G. W. (1981). Fragility of Space Operations in a Nuclear War, *Air University Airpower Symposium*, Kirtland AFB, N. Mex.: Air Force Weapons Laboratory, 2–28.

¹⁷van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

¹⁸Ulsamer, E. (1981). The Long Leap Toward Space Laser Weapons, *Air Force Magazine*, 58–64; Henderson, D. W. (1982). Space-Based Lasers: Ultimate ABM Systems, *Astronautics and Aeronautics*, 44–53.

¹⁹Krafft A. E. (1960). *Space Flight*, Vol. 1, Environment and Celestial Mechanics, ed. Crayson Merrill (New York: D. Van Nostrand Co., Inc.), 287.

²⁰Giffen, B. R. (1982). *US Space System Survivability: Strategic Alternatives for the 1990s*, National Security Affairs Monograph Series 82-4, Washington, D.C.: National Defense University Press, 33–34, 49–52.

²¹van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required? *Computer law & security review*, 33(3), pp.382-389

In 2015, signatories including Professor Stephen Hawking, Steve Wozniak and Elon Musk called for the prohibition of AWS.²² In turn, the International Committee for Robot Arms Control (ICRAC) extended this call, specifically seeking to limit the deployment of autonomous Weapon System in space.²³ The intent of prohibition was to cover both semi-autonomous and fully autonomous weapons, not just in space but also in any theatre of operation. While this may be an ideal situation, it is highly unlikely for the states to consent to such a situation and thus, the best options that are most likely to be complied with by the states must be considered.

Thus, considering the unavoidable proliferation of autonomous Weapon Systems in outer space, the present article shall (A) highlight the law applicable to the use and deployment of AWS in outer space (B); highlight the inadequacies in the present legal regime, and (C) propose a coherent conclusion along with suggestions to accommodate the rights of states to use AWS in a manner that does not endanger the parlous environment of outer space.

II. INADEQUACY OF PRESENT LEGAL REGIME

Some authors including Adam G. Quinn²⁴, contend that the Outer Space Treaty or the OST, the primary law governing outer space is weak and needs to be replaced. The treaty is destined to fail since the OST was formed with the aim of “benefit for all” but in actuality, it not only prohibits scientific explorations that may be highly beneficial but also restricts space from all mankind.

Furthermore, there are certain ambiguities in the OST and hence, no consensus on its mandates. The OST is too broad, and irrelevant to modern space policies due to its ambiguous and weak nature and is on the cusp of failing as weaponization for self-defense and use of dual technology is more consistent with International Humanitarian Law.²⁵

Article 62 of the Vienna Convention on the Law of Treaties codifies the principle of *rebus sic stantibus* that provides that if there is a fundamental change in circumstances, there is a need for reinterpretation of the treaty and correction of state practice. It applies only if relevant circumstances for the treaty existed at the time of the ratification, is an essential basis for the consent and the circumstances have changed so radically that they have transformed the extent

²² Autonomous Weapons: An Open Letter from AI & Robotics Researchers, Future of Life Inst. (Jul. 28, 2015), http://futureoflife.org/AI/open_letter_autonomous_weapons.

²³van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

²⁴Quinn, A.G., 2008. The New Age of Space Law: The Outer Space Treaty and the Weaponization of Space. *Minn. J. Int'l L.*, 17, p.475.

²⁵Wolff, J.M., 2003. ‘Peaceful uses’ of outer space has permitted its militarization—does it also mean its weaponization?. In *Disarmament Forum* (Vol. 1).

of obligations under that treaty. Since there were no weapons based in the earth's orbit in 1967 when the Outer Space Treaty came to be, it can be fairly presumed that the possibility was not contemplated and thus, with the possible weaponization of outer space and the development of space-capable Earth-based weapons, there is now a fundamental change in circumstances and a major shift in priorities that are leading to the need for evolution of the interpretation of the Treaty in a more pragmatic sense.²⁶

However, there are two problems with this approach. Firstly that it does not accurately and effectively address the difficulty in guiding the political will of the states to ratify the "utopian" Outer State Treaty and secondly, the Article fails to recognize that in the present state of affairs, what we need is an adequate interpretation and extension of existing laws in order to cover the gaps since, by the time a new treaty is made, it might be too late.²⁷

There are two possible solutions for accommodating Autonomous Weapon System in the current legal regime of outer space, either by proposing a new interpretation of existing laws or by developing an altogether new Treaty governing AWS. Considering the vast amount of literature and existing international law, it does seem more appropriate to have a more robust interpretation of the present space law as it stands and this is probably a more viable option at present. Therefore, the rest of this paper will argue for the need to develop and accommodate the regulation of autonomous Weapon Systems in the law of outer space.

III. NORMATIVE STRUCTURE REGULATING THE DEPLOYMENT AND USE OF AUTONOMOUS WEAPON SYSTEMS IN OUTER SPACE

The use of autonomous weapons in space is a rather natural incidence of the militarization of space. Ironically, it is also true that the development of autonomous Weapon Systems may be the "impetus to start wars" as these weapon systems are based on the notion of "use independently calculate decisions and materially act upon these decisions,"²⁸ and as such require less human intervention. Hence these are perfect for the hostile environment of Outer Space. In light of this, it is imperative to highlight the International Space Legal regime as it applies to the deployment, use, and liability of using autonomous weapons.

The following sections shall deal with firstly, the permissibility of deploying AWS in Outer

²⁶Bourbonnière, M. and Lee, R.J., 2007. Legality of the deployment of conventional weapons in earth orbit: balancing space law and the law of armed conflict. *European Journal of International Law*, 18(5), pp.873-901.

²⁷Quinn, A.G., 2008. The New Age of Space Law: The Outer Space Treaty and the Weaponization of Space. *Minn. J. Int'l L.*, 17, p.475.

²⁸Van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389

Space i.e. to see whether the deployment of AWS is permissible at all under the current space law regime; *secondly*, the law governing the use of autonomous weapons as a “*use of force or threat to use of force*” shall be analyzed; *thirdly*, the legal obligations that the states must observe whilst use autonomous Weapon System shall be discussed in light of the legal principle of *jus in bello spatialis* including the law regulating the liability for violations ensuing from the use of these weapon systems. The applicable law shall also include the rules of International Humanitarian Law (‘IHL’) for the use of such weapons that are capable of acting both as the weapon and the attacker.

(A) Permissibility for deploying Autonomous Weapons System in Outer Space

The permissibility for deploying AWS must be seen in accordance with the law governing the deployment of space weapons in general and of AWS in particular.

i. Deployment of Space Weapons

A space weapon is a weapon designed to “destroy, damage or otherwise interfere with the normal functioning of an object or being in outer space.”²⁹ The permissibility of placing and using weapons in Outer Space is to be seen in reference to the Outer Space Treaty, General Assembly Resolutions, and other Treaties regulating weapon systems that include Autonomous Weapon Systems of AWS.

Customary international law is irrelevant with respect to this issue because authors have, through a thorough analysis of the objective and subjective elements, concluded that neither is there any customary rule deeming that weapons in outer space are “impermissible”,³⁰ nor is there any rule deeming the weapons permissible.³¹ Nevertheless, since there is clearly an acknowledgment among the states regarding the hazards of weaponizing outer space, a rule of customary international Law may soon follow.³² This would hopefully add additional caveats to warrant the weaponization of space.

ii. Permissibility for the Deployment of Autonomous Weapon System

The only provision in the Outer Space Treaty 1967 or the OST elaborating on weapon systems is Article IV. The OST uses the phrase “*outer space, including the moon and other celestial*

²⁹ INST. FOR NAT'L. STRATEGIC STUDIES, GLOBAL STRATEGIC ASSESSMENT 2009: AMERICA'S SECURITY ROLE IN A CHANGING WORLD 182 (Patrick M. Cronin ed., 2009).

³⁰ Blair S. Kuplic, The Weaponization of Outer Space: Preventing an Extra-terrestrial Arms Race, 39 N.C. J. Int'l L. & Com. Reg. 1123 (2013) at Part IV. B.

³¹ *Id.* At Part IV.

³² David A. Koplow, ASAT-Isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons, 30 MICH. J. INT'L L. 1187, 1222 (2009).

bodies',³³ and appears to require different restrictions on military activities in different 'parts' of outer space.³⁴ Article IV clearly shows that there are two different regulations for 'celestial bodies' and for the 'orbit around of the earth' or the void space between these bodies.

For the former, there is a clear prohibition on the '*establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres*', and on the installation and stationing of '*nuclear weapons or any other kinds of weapons of mass destruction*'.

For the latter, the only prohibition is regarding the placement '*in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction*'. Thus, establishing military bases and testing weapons is permissible in this part.

The inclusion of these two types of weapons is possible because at the time the OST was drafted, the only contemplated threat was that of nuclear weapons.³⁵ The Cologne Commentary,³⁶ while evaluating Article IV observes that while the provision is the center point for any discussion on the weaponization of space, it fails to lay down the definitions of the various terms used and thereby causes ambiguity. Furthermore, the commentary concluded that the fact that only Weapons of Mass Destruction or WMD and Nuclear Weapons were included and non-militarization was only limited to celestial bodies, clarifies unequivocally that the deployment of a conventional weapon in the void is absolutely permissible.

Thus, provided that the autonomous Weapon System are non-nuclear and are not weapons of mass destruction³⁷, the AWS may be placed in both the celestial bodies and the voids between the celestial bodies even if they come under the category of 'conventional or even laser weapons'³⁸ because non-WMD armaments do not violate international space law.³⁹

A very pertinent question now is, whether autonomous Weapon System would come under the category of 'Weapons of Mass Destruction'. Generally, '*Weapons of mass destruction (WMDs) constitute a class of weaponry with the potential to, in a single moment, kill millions of civilians,*

³³Article II, III of OST.

³⁴Ricky J. Lee, Jus Ad Bellum in Outer Space: The Inter-relation between Article 103 of the Charter of the United Nations and Article IV of the Outer Space Treaty, The, 45 Proc. on L. Outer Space 139 (2002)

³⁵Alex B. Engelhart, Common Ground in the Sky: Extending the 1967 Outer Space Treaty to Reconcile US. and Chinese Security Interests, 17 PAC. RIM L. & POL'Y J. 133, 143 (2008).

³⁶Hobe, S., Schmidt-Tedd, B. and Schrogl, K.U. eds., 2017. *Cologne Commentary on Space Law: Outer Space Treaty* (Vol. 1). BWV Verlag.

³⁷Hereinafter, WMD.

³⁸Cheng, The Legal Status of Outer Space and Relevant Issues: Delimitation of Outer Space and Definition of Peaceful Use (1983) 11 J. SPACE L. 89 at 102

³⁹Blair S. Kuplic, The Weaponization of Outer Space: Preventing an Extra-terrestrial Arms Race, 39N.C. J. Int'l L. & Com. Reg. 1123 (2013). Available at: <http://scholarship.law.unc.edu/ncilj/vol39/iss4/6>

*jeopardize the natural environment, and fundamentally alter the world and the lives of future generations through their catastrophic effects.*⁴⁰ Specifically, with reference to space law, there is no clear definition of WMD but it is understood to include nuclear, chemical, and biological weapons.⁴¹ It also encompasses weapons that are composed of ‘*atomic explosive weapons, radioactive materials, lethal chemical, and biological weapons and any other weapon developed in the future that has characteristics comparable in destructive effects to the atomic bomb or other weapons...*’.⁴²

However, AWS that cannot be controlled may also be regarded as WMD and as such be prohibited.⁴³ Thus according to the existing legal regime governing outer space, the autonomous Weapon System can be placed in the orbit around the earth and on celestial bodies, if these do not come under the category of WMDs, and this can be assessed in the context of the Outer Space Treaty and other space treaties, international law of armed conflict and customary international law.

As has been noted above, Article IV clearly establishes that while the AWS cannot be used on the Moon and other celestial bodies for any military purposes, it may be used so in the ‘voids between them’.⁴⁴ Apart from the OST and the UN charter, pursuant to Article III of the OST, other treaties are also applicable to the use of weapons in outer space. *Firstly*, the Anti-Ballistic Missile Treaty, between two of the most powerful players in the international space regime, is guided to limit the defense systems for countering strategic ballistic missiles.⁴⁵ Presently there is protection for three kinds of satellites namely, ‘early warning systems, reconnaissance satellites, and communication satellites.’⁴⁶ Furthermore, the Partial Test Ban Treaty, 1963⁴⁷ is one of the first treaties of its kind but doesn’t grant any protection other than the prohibition against ‘nuclear weapons test explosion, or any other nuclear explosion’.⁴⁸ Moreover, the use

⁴⁰ Weapons of Mass Destruction, United Nations Regional Centre for Peace and Disarmament in Asia and The Pacific, Available at <http://unrcpd.org/wmd/>.

⁴¹ Graham Jr, T., 2011. *Common sense on weapons of mass destruction*. University of Washington Press.

⁴² Hobe, S., Schmidt-Tedd, B. and Schrogl, K.U. eds., 2017. *Cologne Commentary on Space Law: Outer Space Treaty* (Vol. 1). BWV Verlag.

⁴³ Crootof, R., 2015. The Varied Law of Autonomous Weapon Systems. *NATO ALLIED COMMAND TRANSFORMATION, AUTONOMOUS SYSTEMS: ISSUES FOR DEFENCE POLICY MAKERS* (Andrew Williams & Paul Scharre, eds.) (2015, Forthcoming).

⁴⁴ Cheng, The Legal Status of Outer Space and Relevant Issues: Delimitation of Outer Space and Definition of Peaceful Use (1983) 11 J. SPACE L. 89 at 102

⁴⁵ Pericles Gasparini Alves, Prevention of an Arms Race in Outer Space: A Guide to the Discussions in the Conference on Disarmament, UNDIR/91/79/, Part 1:59.

⁴⁶ Verifying START: From Satellites to SusTOCt Sites’, by Dunbar Lockwood in *Arms Control Today*^ vol. 20, No. 8, October 1990, pp. 13-19

⁴⁷ Treaty Banning Nuclear Weapons Test in the Atmosphere, in Outer Space and Under Water’, United Nations Treaty Series, vol 480, No. 6964

⁴⁸ Article 1 Treaty Banning Nuclear Weapons Test in the Atmosphere, in Outer Space and Under Water’, United Nations Treaty Series, vol 480, No. 6964.

of space weapons must be done in compliance with environmental protection conventions,⁴⁹ as well as the Environmental Modification Convention (ENMOD),⁵⁰ which focuses on ‘military or any other hostile use of the environment’ based on the area, duration, and intensity of the modifying phenomenon and defines rather liberally, the term ‘environmental modification techniques’ and 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, or of outer space.⁵¹ Furthermore, the Moon Agreement, 1979,⁵² extending upon Articles II and IV of the OST, lays down a more intrusive verification provision than the OST and ENMOD.⁵³

There are certain UN Resolutions relevant to the weaponization of space, the effect of which must also be analyzed in the context of the deployment of AWS. The First Committee (Disarmament and International Security) has drafted various resolutions including ‘Prevention of an Arms Race in Outer Space’,⁵⁴ that seeks to reaffirm the importance and urgency of preventing an arms race in outer space and was approved by a vast majority of 175 votes in favour to 2 against (Israel, United States), with no abstentions.

The draft resolution on ‘Further Practical Measures for the Prevention of an Arms Race in Outer Space’⁵⁵, that seeks to call upon the Group of Governmental Experts for furthering practical measures and making recommendations on substantial elements of a related international legally binding instrument to prevent outer space arms race, was not approved in totality. Further, the resolution ‘No First Placement of Weapons in Outer Space’,⁵⁶ which urges an early commencement of substantive work in the Conference on Disarmament on the topic based on an updated draft treaty introduced by China and the Russian Federation in 2008 and for all states to resolve to not be the first to deploy arms in the outer space, was also rejected but to the extent that it had got the assembly to reaffirm that practical measures should be examined and taken in the search for agreements to prevent an arms race in outer space, the same was approved by 114 members.

⁴⁹ Bill Boothby, *Space Weapons and the Law*, 93 *Int'l L. Stud. Ser. US Naval War Col.* [i] (2017)

⁵⁰ Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, 1977. Hereinafter ENMOD.

⁵¹ Pericles Gasparini Alves, *Prevention of an Arms Race in Outer Space: A Guide to the Discussions in the Conference on Disarmament*, UNDIR/91/79/, Part 1:59.

⁵² ‘Agreement Governing the Activities of States on the Moon and Other Celestial Bodies’, Official Records of the General Assembly A/RES/34/68, Annex, 1979

⁵³ Pericles Gasparini Alves, *Prevention of an Arms Race in Outer Space: A Guide to the Discussions in the Conference on Disarmament*, UNDIR/91/79/, Part 1:59.

⁵⁴ Document A/C.1/74/L.3

⁵⁵ Document A/C.1/74/L.58/Rev.1

⁵⁶ Document A/C.1/74/L.59

Finally, being very relevant to the AWS, the Committee had also approved the Draft Resolution on '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'.⁵⁷

Thus, there is no outright ban against deployment of weapons in space and, provided the Autonomous Weapon System are not capable of causing superfluous injury and are not indiscriminate, it can be deployed in outer space.

Though there are hardly any direct regulations for AWS in international law, the legal framework of the IHL allows only those weapons as legal which are based on the Human in the Loop system. These are weapon systems that are principally under the control of human beings and from time to time can move to an automatic system for military need. Most of the AWS legal norms in international law, are designed, following this tradition. Therefore, space can't be an exception to this. Though there are very limited uses of AWS in space in present time, the subsequent practice that has developed must be followed in outer space. The legal character of subsequent state practice is accepted in international law in various ICJ judgments. International Humanitarian Law has already accepted these two conditions for AWS. The first one is the Human in the Loop and the second one is human supervision. Though the OST and other space law treaties don't have specific provisions for regulation of AWS based on the non-militarization of outer space principle which finds mention in Article IV of the OST 1967. Following the Article other space treaties such as the Rescue Convention, Liability Convention and Registration Convention and other General Assembly resolutions have followed the same tradition of supporting the idea of not placing weapons in outer space. In fact States for a very long time didn't place any AWS in outer space. Therefore, the regulation of AWS based on this subsequent state practice may work as a *lex ferenda* in international space law.

However, if AWS is set to be used in outer space in the future, then international law will have to deal with issues surrounding it and have possible answers to questions that are likely to be raised by States. The use of AWS can either be for aggressive purposes or can be used for defensive purposes. The legal regime of subsequent state practice as it stands today is for the general use of AWS and has not allowed its usage in outer space for any reasons, be it aggressive or for self-defense. Therefore, this paper argues that any use of AWS in outer space is likely to ruffle feathers and will trigger the concept of reparation in international law. However the legal consequences for both uses are not the same. The legality of the use of AWS in outer space can be understood from the standpoint of the well-established law of self-defense. It is likely that

⁵⁷Document A/C.1/74/L.54

if AWS is used for defending space assets, it may come within the scope of Article 51 of the United Nations Charter. The International Court of Justice had, in the *Nicaragua* case developed the doctrine that the armed attack of stage three enables states to use force in international law. Therefore, if the use of AWS falls within the scope of Article 51 of the UN charter that use is legal in international law. Therefore, we argue that if AWS is used for self-defence it may not trigger the law of responsibility, but it may become a ground for compensation under the international law of liability. Liability arises when there is no violation of international law per se, but damage has occurred in reality. Moreover, even armed attack to justify the use of AWS in self-defence must fulfill the customary International Humanitarian Law principles of distinction, proportionality and precaution. This legality is only applicable if the use of AWS in outer space is not aggressive in nature.

(B) Use of AWS for Aggressive Purposes

While non-nuclear, non-Weapons of Mass Destruction AWS can be placed in outer space, it is important to study whether these can be used for aggressive purposes. In other words, can these be used by the state parties as ‘*use of force or threat to use of force*’?

This question basically pertains to the permissibility of aggression in Outer Space.

Two provisions of the Outer Space Treaty 1967 are illustrative of the nature of the activities permissible under the OST. Article I of the treaty states that ‘*The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries...*’ Thus, any use of AWS should be ‘*for the benefit and in the interests of all countries*’. This doesn’t *per se* deem aggression impermissible because the word ‘interest’ might also cover national security interests and ‘all countries’ may be interpreted to include the maintenance of international peace and security and not necessarily be beneficial to all ‘the’ countries.⁵⁸

To further elaborate on the meaning of this phrase, we can take the assistance of Article IV of the OST that uses the phrase ‘*peaceful purposes*’ specifically for activities on the moon and other celestial bodies. This phrase is regarded as the ‘focal point’ in the treaty with regard to use of space for military purposes.⁵⁹ This term has also been used in the Antarctic Treaty wherein it is defined as ‘non-military’. However, considering the specific and restrictive language in the wording of Article IV that limits the ‘peaceful purposes’ requirement to celestial bodies, it is

⁵⁸ Bourbonnière, M. and Lee, R.J., 2007. Legality of the deployment of conventional weapons in earth orbit: balancing space law and the law of armed conflict. *European Journal of International Law*, 18(5), pp.873-901.

⁵⁹ Kai-Uwe Schögl & Julia Neumann, Article IV, in *Cologne Commentary on Space Law*, supra note 55, at 70, ¶ 1.

unlikely that the framers intended a broad demilitarization of outer space. This view has also been advocated by the United States.⁶⁰

Elaborating on the ambiguity of the phrase, the Cologne Commentary mentions that while the phrase should ideally mean a complete demilitarization, except an aggressive use in pursuance of UNGA Resolution 3314, it may also mean that any use should not be contrary to a promotion of peace.⁶¹ This leaves room for non-aggressive military uses,⁶² which is what is being exercised. Thus, the use of AWS in Outer Space for Military purposes is permissible provided it is done *'in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding,'* as required by Article III of the OST 1967.

Article 103 of the United Nations Charter,⁶³ reaffirmed by the Vienna Convention on the Law of Treaties,⁶⁴ also asserts that the Charter prevails over other international treaties. Consequently, Article III of the OST read together with Article 103 of the UN Charter requires that any use of weapons in space must be consistent with Chapter VII and Article 2.4 of the UN Charter.⁶⁵

Article 2.4. of the UN Charter states that;

'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the purposes of the United Nations.'

This is, of course, subject to a few exceptions, in which cases the use of AWS will be legal. Thus, firstly, an action using AWS undertaken pursuant to a binding decision by the Security Council as per Article 25 and 48 of the Charter, is permissible. Secondly, it can also be legally used for 'Inherent and collective Self-defense' under Article 51 of the Charter, provided the force used is 'necessary and proportionate to the armed attack.'⁶⁶ Lastly, albeit controversial, it is generally accepted that humanitarian intervention is a justification for the use of force.⁶⁷ Some

⁶⁰ Treaty on OuterSpace: Hearings before the Senate Committee on Foreign Relations, supra note 4, at p. 59; and Christol, supra note 4, at pp. 29-30.

⁶¹Hobe, S., Schmidt-Tedd, B. and Schrogl, K.U. eds., 2017. *Cologne Commentary on Space Law: Outer Space Treaty* (Vol. 1). BWV Verlag.

⁶²Rao, R.V., Gopalakrishnan, V. and Abhijeet, K. eds., 2017. *Recent Developments in Space Law: Opportunities & Challenges*. Springer.

⁶³Hereinafter, UN charter.FOOTNOTE SEEMS UNNECESSARY, PLEASE CHECK

⁶⁴ Vienna Convention on the Law of Treaties (1980) 1155 U.N.T.S. 331, Art. 30.

⁶⁵ Ricky J. Lee, Jus Ad Bellum in Outer Space: The Interrelation between Article 103 of the Charter of the United Nations and Article IV of the Outer Space Treaty, The, 45 Proc. on L. Outer Space 139 (2002)

⁶⁶Bowett, UNITED NATIONS FORCES (1964), p. 54.

⁶⁷ Harris, CASES AND MATERIALS ON INTERNATIONAL LAW (5th ed., 1998), p. 866. Also, Simma, NATO, the UN and the Use of Force: Legal Aspects (1999) 10 EUR. J. INT'L. L. 1; Cassese, Ex iniuria ius oritur: Are We

authors claim that the use of force is also permissible in outer space in an action undertaken within the scope of Article 42 of the Charter,⁶⁸ because the UN Charter, irrespective of the wording, intends to apply in ‘all circumstances’, to the outer space regime.⁶⁹ The Principles Relating to Remote Sensing of the Earth from Outer Space, that is arguably customary international law,⁷⁰ ‘may offer regulation on weapon systems gathering and processing information whilst based in space and how to mitigate against their controversy.’⁷¹

Furthermore, it is important to mention that Article IX of the OST establishes that outer space is to be explored and used with due diligence, as a *res communes omnium* in Roman law, taking into account the interests and rights of other states. The principle implies that the actions of States must be carried out with a certain standard of care, attention and observance towards other States,⁷² and states are bound to ensure that the exercise of their rights and freedoms in outer space does not interfere with, or compromise the safety of space operations.⁷³ While these plain prohibitions exist, the outer space regime is porous enough to allow for the use of AWS.

Aggression of any kind or in any form, is prohibited by international law. The commission of aggression is a crime under international customary law as well. State as well as individual can be held responsible for committing crimes of aggression. Therefore, the use of AWS for the purpose of aggression shouldn’t be allowed either in space or on earth. The *lex specialis* law here prohibits any kind of aggression in international law. After the Second World War, the prohibition of aggression is one of the positive developments of international law. Scholars of international law, consider prohibition of an act of aggression as a peremptory norm of international law.

Therefore, aggression in any form including by AWS in outer space is completely prohibited. However, the changing nature of the use of force and self-defence has made a remarkable impact on international law. The development of anticipatory self-defence, peremptory self-defence and

Moving towards International Legitimation of Forcible Humanitarian Countermeasures in the World Community (1999) 10 EUR. J. INT’L. L. 23; and Reisman, Unilateral Action and the Transformations of the World Constitutive Process: The Special Problem of Humanitarian Intervention (2000) 11 EUR. J. INT’L. L. 3.

⁶⁸ Art. 27 of the Charter and Wolfrum and Philipp, UNITED NATIONS: LAW, POLICIES AND PRACTICE (1995) at pp 1404-1405.

⁶⁹ MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 125 (1972, re-issued 2010).

⁷⁰ Lyall, F & Larsen, B. P. (2009). Space Law: A Treatise. (eds). Farnham, England and Burlington, VT: Ashgate.

⁷¹ Van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389.

⁷² Sergio Marchisio, Article IX Principle of Due Regard and Protection of Space Environment in I COLOGNE COMMENTARY ON SPACE LAW, 175, 176 (Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl eds., 2009).

⁷³ Sergio Marchisio, Article IX (commentary) OST, II COLOGNE COMMENTARY ON SPACE LAW 23 (Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl eds., 2013).

humanitarian intervention has allowed aggression in some forms. However all these uses of force are kept out of the scope of the crime of aggression in international law though the ICJ still considers the third stage of armed attack as a legal ground for self-defense. The growing acceptance by the states of anticipatory/preemptory/ humanitarian intervention has however rapidly changed the state practice. These theories aren't only accepted by states, the UN has also accepted these state practices several times in different Resolutions. Therefore, if AWS is used for any of the three conditions above mentioned by aggressive use, it can't be considered as illegal in international law. Moreover, space is unique in character with respect to its environment. The usage of Autonomous Weapon System if for destroying any asteroids or alien attacks is not prohibited in international law. These incidents fall well within the scope of Article 51 of UN charter.

(C) Compliance requirements for AWS in Outer space (Jus in bello spatialis)

The outer space legal regime suffers from various impediments in terms of a concrete regulatory mechanism. The increased risk of warfare in space poses questions regarding the effectiveness of governance by the norms of the outer space legal regime.

While, the IHL and the Outer space are two separate legal regimes, with the possibility of space warfare, both may be simultaneously applied in a dispute relating to the use of AWS in space during an armed conflict. This is also in line with the rationale of Article III of the OST. In such a situation, especially in light of the AWS, the application of International Humanitarian Law comes into play. This interaction will determine the legal regime that will govern the regulation of AWS. Thus, it becomes fundamental to determine the interrelationship between these regimes.⁷⁴

The following section shall highlight the compliance requirements for AWS under International Humanitarian Law along with an analysis of how these laws would apply in their use in outer space. Furthermore, areas where a normative conflict between these two regimes, both of which constitute *lex specialis*, shall also be highlighted.

(D) Law governing responsibility ensuing from the use of AWS in outer space

The question of attribution and responsibility for the violations ensuing from the acts of an Autonomous Weapons System is very complicated especially with respect to terrestrial warfare. Various considerations come into play. The military commander, the programmer, the manufacturer and the robot itself may be held accountable for a violation by the AWS. While it

⁷⁴Stephens, D., 2018. The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and the Outer Space Legal Regime.

will be both unfair and difficult to ascribe responsibility with *mens rea* on the former three as long as they act with due diligence, the AWS is not punishable if the robots ‘Go-Rogue’, there’ll be no effective sanctions.⁷⁵

However under International Space Law, the question of apportioning responsibility for any harm ensuing from the use of AWS is a rather simple one. The OST clearly enumerates that State parties shall bear international responsibility for actions in outer space regardless of whether such activities are conducted by governmental or non-governmental agencies,⁷⁶ and they shall be internationally liable for the same.⁷⁷ Even in case of the use of AWS on the high seas, which is very similar to outer space, the responsibility of any loss or damage is attributed to the Flag State.⁷⁸ State parties must also retain ‘jurisdiction and control’ over registered objects and are expected to return recovered objects.⁷⁹ Furthermore, for covering both the ‘*willful and unintended damages caused by deliberate means or the malfunction of AWS*’,⁸⁰ the Convention on International Liability for Damage Caused by Space Objects, 1972 is illustrative of the rules for assessing State Liability.

Further expanding these obligations, the Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space, 1968 pins the obligation to reimburse related expenses, on the launching State.⁸¹

The responsibility for using AWS in outer space may arise in two conditions. Firstly, if AWS is used in outer space without human control or used for aggressive purposes which don’t fall under the scope of Article 51 or 2.4 of UN Charter the determination of such responsibility will be based upon the Draft Principles of State Responsibility 2001. The act of using AWS must be attributable to the State and the act must be illegal or in breach of existing international law. Therefore, if states use AWS in outer space without human control or use it for aggression, they can be held responsible for their act. The states or state that suffers damage for this, may ask for reparation under the same Draft. However due to the uniqueness of outer space, if AWS violates international law without doing any damage to a particular state, the state or states can

⁷⁵Sassoli, M., 2014. Autonomous weapons and international humanitarian law: Advantages, open technical questions and legal issues to be clarified. *International Law Studies/Naval War College*, 90, pp.308-340

⁷⁶Article VI, OST 1967.

⁷⁷Article VII, OST 1967.

⁷⁸Crootof, R., 2015. The Varied Law of Autonomous Weapon Systems. *NATO ALLIED COMMAND TRANSFORMATION, AUTONOMOUS SYSTEMS: ISSUES FOR DEFENCE POLICY MAKERS* (Andrew Williams & Paul Scharre, eds.)(2015, Forthcoming).

⁷⁹Article VIII, OST 1967.

⁸⁰Van Esch, P., Northey, G., Striluk, M. and Wilson, H., 2017. Autonomous weapon systems: Is a space warfare manual required?. *Computer law & security review*, 33(3), pp.382-389.

⁸¹Article 5, Agreement on the Rescue of Astronauts, 1968.

still be held responsible for their action in outer space.

(E) Interational Humanitarian Law governing Autonomous Weapons System

International Humanitarian Law or IHL is an international law regime guided to limit the means and methods of warfare. International Humanitarian Law comprises primarily of Treaty Law that includes the 1907 Hague Conventions,⁸² and the 1949 Geneva Conventions,⁸³ together with the Additional Protocols of 1977,⁸⁴ and customary international law.⁸⁵

Space weapons, including potentially Autonomous Weapon Systems, capable of destroying satellites albeit ‘bloodless’, can be considered weapons or means of warfare.⁸⁶ Thus, there are various regulations under IHL. To summarize the compliance requirements of AWS to adhere to IHL Rules, a very important factor is that AWS which is capable of performing both as the ‘weapon’ as well as the ‘attacker’, must comply with the law pertaining to both.

Nevertheless, the law governing AWS under International Humanitarian Law must be complied with during warfare in space. This is because;

- a. Both the legal regimes are applicable (respective treaties as per the facts of the dispute) for an ‘interpretation and application’ in the dispute.
- b. None of the legal regimes explicitly exclude the application of another or restrict the application of itself.

There is no apparent conflict between International Humanitarian Law and the OST. However, in a few matters, a normative conflict may ensue. In such situations, it must be kept in mind that at the time of armed conflict, International Humanitarian Law being the *lex*

⁸² Regulations Respecting the Laws and Customs of War on Land, annexed to Convention No. IV Respecting the Laws and Customs of War on Land, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539 [hereinafter 1907 Hague Regulations].

⁸³ Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Aug. 12, 1949, 75 U.N.T.S. 31 [hereinafter GC I]; Geneva Convention 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 GC II]; Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, 75 U.N.T.S. 135 [hereinafter GC III]; Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 75 U.N.T.S. 287 [hereinafter GC IV].

⁸⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter AP I]; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 609 [hereinafter AP II].

⁸⁵ Customary IHL Database, INTERNATIONAL COMMITTEE OF THE RED CROSS, <https://ihl-databases.icrc.org/customary-ihl/eng/docs/home>.

⁸⁶ Todd Barnet, United States National Space Policy, 2006 & 2010, 23 FLA. J. INT'L L. 277, 279 (2011).

specialis,⁸⁷ will substitute the provisions of the OST to the extent of the inconsistency,⁸⁸ while not vacating the liabilities ensuing from the other regimes.⁸⁹

i. Weapons law under International Humanitarian Law

The Weapons Law under the IHL regime includes the requirement of a weapon to be indiscriminate as per Article 51 (4) (b)⁹⁰, which is also a principle of customary international law.⁹¹ This requires supplying sufficiently reliable and accurate data to ensure that the AWS can be aimed at a military objective.⁹² The second requirement is to ensure as per Article 35 (2)⁹³ and customary international law⁹⁴, that the weapon system doesn't cause superfluous injury.

To verify compliance with the aforementioned, a legal review under Article 36, Additional Protocol I is required which also assesses if the weapon is not otherwise prohibited under the treaty and customary law. Also analyzed are the foreseeable effects of the weapons through verification and testing to an extent such that there a high standard of predictability and reliability.⁹⁵ This is a very effective measure to regulate legal and ethical issues of AWS.⁹⁶ Furthermore, this review must be made at the stage of deployment or whenever additional changes are made.

For the use of AWS in outer space, the Convention on Registration of Objects Launched into Outer Space, 1976 calls for the registration of all weapons deployed in outer space. The meaning of 'appropriate registry' in terms of Article II must be read with Article III of the OST with the revision of its applicability to military activities due to Article VI. Thus, the appropriateness must also be in line with other international law principles including the Law of armed conflict

⁸⁷ Int'l Law Comm'n, Draft Articles on the Effects of Armed Conflicts on Treaties, with Commentaries, Rep. on the Work of Its Sixty-Third Session, U.N. Doc. A/66/10, at 175–211 (2011) (noting that the Draft Articles and Commentaries were also published in volume 2 of the 2011 Yearbook of the International Law Commission) [hereinafter ILC Armed Conflict Report].

⁸⁸ Stephens, D., 2018. The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and the Outer Space Legal Regime.

⁸⁹ JOOST PAUWELYN, CONFLICT OF NORMS IN PUBLIC INTERNATIONAL LAW 385 (James Crawford et al. eds., 1st ed. 2003).

⁹⁰ Article 51 (4) (b) of Additional Protocol I

⁹¹ w. International Committee Of The Red Cross, Customary International Humanitarian Law rule 7 (Jean-Marie Henckaerts & Louise Doswald-Beck eds., 2005)

⁹² Thurnher, J., 2013. The Law That Applies to Autonomous Weapon Systems.

⁹³ Article 35 (2) of Additional Protocol I

⁹⁴ Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 78 (July 8).

⁹⁵ Neil Davidson, 'A Legal perspective: Autonomous Weapon Systems Under International Humanitarian law' in Perspective on Lethal Autonomous Weapons Systems . (New York, United Nations Publications, 2017), 7-8. <https://s3.amazonaws.com/unoda-web/wp-content/uploads/2017/11/op30.pdf>.

⁹⁶ Crootof, R., 2015. The Varied Law of Autonomous Weapon Systems. *NATO ALLIED COMMAND TRANSFORMATION, AUTONOMOUS SYSTEMS: ISSUES FOR DEFENCE POLICY MAKERS* (Andrew Williams & Paul Scharre, eds.) (2015, Forthcoming).

which is *lex specialis* in the matter.⁹⁷ This means that the aforementioned obligations under International Humanitarian Law should be taken into account when considering the propriety during registration.

The deployment of military weapons in outer space would be subject, when launching, deploying, and using such weapons, to the duty to heed, pay attention to, and take care of the rights of other states to have access to, navigate in, and use outer space.⁹⁸ This duty to have due regard is equally applicable during times of peace and of armed conflict and must be reflected in the rules of engagement as applicable to space-based weapons.

ii. Target Law under International Humanitarian Law

Target Law requires compliance with the Rule of Distinction (under Articles 48, 51 and 52 of Additional Protocol I), Rule of Proportionality under both Articles 51 (5) (b) and 57 (2) (ii) and Rule of Precautions under Article 57. These are customary principles of international law as well.⁹⁹ These must be complied with by the AWS with ‘reasonable commander’ standard,¹⁰⁰ and require ‘programming the law of war’.¹⁰¹ The Martens Clause and Article 57 Additional Protocol I are also required to be complied with, which have been discussed below.

The AWS is required to comply with all these requirements. In the context of space warfare, it is important to note with regards to the Rule of Distinction that dual-use satellites and spacecrafts that may be used for both civil and military purpose must only be attacked by the AWS if they, ‘*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.*’¹⁰² While ‘purpose’ and ‘use’ are difficult to determine, the test must be of an ‘*obvious intention to attack*’.¹⁰³ Furthermore, while astronauts are regarded as ‘envoys of mankind’ under the OST, astronauts operating military spacecraft would be ‘combatants’ under the IHL and as such, can

⁹⁷JinyuanSu, Use of Outer Space for Peaceful Purposes: Non-Militarization, Non-Aggression and Prevention of Weaponization, 36 J. Space L. 253 (2010)

⁹⁸Bourbonnière, M. and Lee, R.J., 2007. Legality of the deployment of conventional weapons in earth orbit: balancing space law and the law of armed conflict. *European Journal of International Law*, 18(5), pp.873-901.

⁹⁹Sehrawat, V., 2017. Legal Status of Drones under LOAC and International Law. *Penn St. JL & Int'l Aff.*, 5, p.164.

¹⁰⁰Crootof, R., 2015. The Varied Law of Autonomous Weapon Systems. *NATO ALLIED COMMAND TRANSFORMATION, AUTONOMOUS SYSTEMS: ISSUES FOR DEFENCE POLICY MAKERS* (Andrew Williams & Paul Scharre, eds.)(2015, Forthcoming).

¹⁰¹Anderson, K. and Waxman, M.C., 2013. Law and ethics for autonomous weapon systems: Why a ban won't work and how the laws of war can.

¹⁰²Article 52, Additional Protocol I.

¹⁰³Liang JIE, ‘Whither the human in armed conflict? IHL implications of new technology in warfare’, 42nd Round Table on Current Issues Of International Humanitarian Law On The 70th Anniversary Of The Geneva Conventions, ICRC, 4-6 September 2019.

be legally targeted and attacked.

Also, any attack undertaken by the AWS, even though well within the rights under the IHL, should avoid such damages that may lead to space debris problems because the parties are required 'to protect the natural environment against widespread, long-term and severe damage'.¹⁰⁴

The mandate of Article 57 of the Additional Protocol I, also a rule of CIL,¹⁰⁵ poses among others, the obligation of predicting the uncertainties on the battlefield and accordingly taking 'Proportional' action. It also requires good faith and reasonable response as per available information.¹⁰⁶ While all of these things may be programmed into the AWS, it is something that has to be checked in the legal review of the weapon under Article 36 of the Additional Protocol II¹⁰⁷. While it requires experience,¹⁰⁸ and the ability to assess and react to ambiguities,¹⁰⁹ machine learning may make it possible for a machine like an AWS to learn and improve with experience without being explicitly programmed to do so.¹¹⁰

Also, in the context of Outer Space, it may be fairly difficult to comply with the Rule of Proportionality as the AWS as space weapons are likely to be very lethal, especially operating in the space environment where there is no atmosphere.

iii. *Martens Clause*

Another requirement is the Martens Clause¹¹¹, that brings in the principles of humanity and the dictates of public conscience. It is mentioned in various treaties¹¹² and ICJ Judgments.¹¹³ The

¹⁰⁴Article 55, Additional Protocol I.

¹⁰⁵ CIHL database Rules 16-18.

¹⁰⁶INT'L COMM. RED CROSS & NILS MELZER, INTERPRETIVE GUIDANCE ON THE NOTION OF DIRECT PARTICIPATION IN HOSTILITIES UNDER INTERNATIONAL HUMANITARIAN LAW 75 (2009).

¹⁰⁷Article 36 of the Additional Protocol II

¹⁰⁸Sassoli, M., 2014. Autonomous weapons and international humanitarian law: Advantages, open technical questions and legal issues to be clarified. *International Law Studies/Naval War College*, 90, pp.308-340

¹⁰⁹Herbach, J.D., 2012. Into the Caves of Steel: Precaution, cognition and robotic weapon systems under the International Law of Armed Conflict. *Amsterdam LF*, 4, p.3.

¹¹⁰Bishop, C.M., 2006. *Pattern recognition and machine learning*, Springer.

¹¹¹ IN ADVISORY OPINION OF THE INTERNATIONAL COURT OF JUSTICE (ICJ) ON THE LEGALITY OF THE THREAT OR USE OF NUCLEAR WEAPONS ISSUED ON 8 JULY 1996, THE COURT EXPLICITLY DISCUSSED THE EXTENT AND VIABILITY OF THE CLAUSE.

¹¹²The Preamble to the Hague convention on the laws and Customs of War on Land and the same sentiment was embodied in the Preamble to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons, 1949 Geneva Conventions for the Protection of Victims of War, Article 1, paragraph 1 of the Additional Protocol I and Preamble to the additional protocol II, Preamble to the Certain Conventional Weapons Convention of 1980, Resolution XXIII of the Tehran Conference on Human Rights of 1968, and is addressed by the International court of Justice and Human right bodies.

¹¹³Mero, T., 2000. The Martens Clause, principles of humanity, and dictates of public conscience. *American Journal of International Law*, 94(1), pp.78-89.

Martens Clause rebuts the presumption that what is not explicitly prohibited is allowed in International Humanitarian Law by bringing the dictate of compliance with principles of humanity and public conscience¹¹⁴. It has various versions.¹¹⁵The ICRC has contended that this is perhaps the most important question pertaining to the legality of AWS.¹¹⁶ It has also been contended that since the Autonomous Weapon System can never be equipped to comply with this,¹¹⁷ it should as such be prohibited.¹¹⁸ However this paper argues that the Autonomous Weapon System may be programmed to comply with the IHL Rules as an average soldier in the future.

Furthermore, armed conflict is characterized as a complex, dynamic and unpredictable environment. It was highlighted by Sassoli¹¹⁹ when he said that the psychological process of human judgment is necessary for the complex scenario of war. A moral agent having an understanding of the strategic and tactical implications in a complex scenario is needed.¹²⁰The wartime environment is messy and complicated and various factors like enemy adaptation, degraded communications, environmental hazards, civilians in the battlespace, cyber-attacks, malfunctions, and ‘friction’ in war are essential to be judged by humans.¹²¹

If legal and ethical norms are codified and incorporated in weapons with emerging technologies of automation, the incremental movement towards autonomy can be regulated and made to serve the ends of law on the battlefield.¹²² This long discussion on outer space law proves that there are hardly any specific regulations for Autonomous Weapons System in outer space. Though, General Assembly Regulations have developed certain soft laws regulating an arms

¹¹⁴KALSHOVEN, CONSTRAINTS ON THE WAGING OF WAR, MARTINUS NIJHOFF, DORDRECHT, 1987, p. 14.

¹¹⁵PREAMBLE, 1907 HAGUE CONVENTION (IV) RESPECTING THE LAWS AND CUSTOMS OF WAR ON LAND, REPRINTED IN A. ROBERTS AND R. GUELF, DOCUMENTS ON THE LAWS OF WAR, 2ND ED., CLARENDON PRESS, OXFORD, 1989, P. 45; THE FOUR 1949 GENEVA CONVENTIONS FOR THE PROTECTION OF WAR VICTIMS (GC I: ART. 63; GC II: ART. 62; GC III: ART. 142; GC IV: ART. 158), OP. CIT ., PP. 169-337; 1977 ADDITIONAL PROTOCOL I, ART. 1(2), OP. CIT ., P. 390, AND 1977 ADDITIONAL PROTOCOL II, PREAMBLE, OP. CIT ., P. 449; 1980 WEAPONS CONVENTION, PREAMBLE, OP. CIT ., P. 473.

¹¹⁶Statement from Int'l Comm. Red Cross, Convention on Certain Conventional Weapons (CCW) Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS), 13-16 May 2014 (May 13, 2014), available at [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/C99C06D328117A11C1257CD7005D8753/\\$file/ICRC_MX_LAWS_2014.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/C99C06D328117A11C1257CD7005D8753/$file/ICRC_MX_LAWS_2014.pdf).

¹¹⁷Lewis, J., 2014. The case for regulating fully autonomous weapons. *Yale LJ*, 124, p.1309.

¹¹⁸Docherty, B., 2012. *Losing humanity: The case against killer robots*.

¹¹⁹Sassoli, M., 2014. Autonomous weapons and international humanitarian law: Advantages, open technical questions and legal issues to be clarified. *International Law Studies/Naval War College*, 90, pp.308-340

¹²⁰Asaro, P., 2012. On banning autonomous weapon systems: human rights, automation, and the dehumanization of lethal decision-making. *International Review of the Red Cross*, 94(886), pp.687-709.

¹²¹Asaro, P., 2012. On banning autonomous weapon systems: human rights, automation, and the dehumanization of lethal decision-making. *International Review of the Red Cross*, 94(886), pp.687-709

¹²²Anderson, K. and Waxman, M.C., 2013. Law and ethics for autonomous weapon systems: Why a ban won't work and how the laws of war can.

race in outer space, most of them aren't comprehensive. Interestingly, these are silent about the use of Autonomous Weapon System in outer space. The basic law relating to weapons in outer space or celestial bodies is therefore the OST. The OST laws and International Humanitarian Law laws are not in conflict on any parameters and in fact both can be applied harmoniously to regulate Autonomous Weapons System in Outer Space. Article 31 of the VCLT 1969 allows the use of harmonious construction of both under international law. Therefore, to claim that there is no governance in outer space on AWS is not completely correct. The fragmentation of international law allows the applicability of International Humanitarian Law for regulation of Autonomous Weapons System in outer space. All the existing soft/hard laws on AWS are applicable in outer space.

IV. CONCLUSION

In conclusion, it will not be out of place to state that like every major development, Autonomous Weapon System comes with its own pros and cons. The situation becomes more dangerous and precarious when the question comes in the context of the outer space legal regime. The onus lies on the International community as a whole to make the best of this development by allowing its use in a regulated yet strict manner.

The current normative structure of outer space is an alternative interpretation with the help of other areas of international law to regulate the use of autonomous Weapon System in the face of increased weaponization of space. While reading IHL harmoniously affords increased protection, questions relating to the use of autonomous Weapon Systems must be addressed with other regulatory factors in a comprehensive international instrument that is flexible and foreseeably covers all problems accruing from its use in space and is acceptable to the international community as a whole.

Our research reveals that the uses of autonomous Weapon Systems in outer space are divided between aggressive and non-aggressive uses. The non-aggressive use is governed under the Charter of the UN. Article 2.4 and Article 51 have developed enough literature for the lawful use of autonomous Weapon Systems in outer space. If the use of AWS doesn't fall under this category, it may be called an aggressive use of autonomous Weapon Systems in outer space. The aggressive use also has exceptions under international law. If the aggression is shown as an anticipatory defense or a pre-emptive strike or humanitarian intervention, state practices are being developed to bring it under the scope of Article 51 of the UN Charter. In the last case, if the use of an autonomous Weapon System doesn't qualify to be under the scope of Article 51 of the UN Charter, the responsibility will have to be governed by the customary international

law or the Draft Principles of State Responsibility 2001. States can be held responsible for their wrongful action and reparation is possible under international law. While deterring the responsibility, our research also found there is no contradiction between International Humanitarian Law and international space law in general. In conclusion, one can state that there is no stepping back from expansion into outer space. Every country big or small would be keen on having a footprint in outer space and in their bid to make a mark, the possibility of a space war of sorts cannot be negated or overlooked. The Autonomous Weapons System is a powerful means of control and without regulation is likely to turn into the proverbial 'Frankenstein' in the hands of a few states of the world. The need of the hour, therefore, is to have a robust and strong legal framework that can hold States accountable for lapses and regulate the usage and control of outer space in a way that won't be detrimental to anyone and will in fact protect humanity as a whole. Indeed, the need of the hour is for a legal framework that can avert any possibility of an at-all of war in space that can be devastating to all.
