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**OMNICIDE OR TECHNOLOGICAL UTOPIA?
AUTONOMOUS WEAPONS SYSTEMS AND THE FUTURE**

Submitted for LLB (Honours) Degree

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2020

Abstract

The contemporary reality of automated weapons are inter alia an international law issue due to their ability for use during armed conflict. The international framework ensures that there are, theoretically, no lacunas in the law, however autonomous weapons systems present new and unique issues which means that the shoe no longer fits well. This is particularly the case with the main testing mechanism for autonomous weapons systems – Article 36. This state of affairs implores consideration of options for reform, yet there are comprehensive issues with all reform options, thus advancing the argument that international law cannot solve all issues in the context of autonomous weapons systems. A cautious approach is needed when it comes to the future development of autonomous weapons systems so that unintended consequences can be avoided. Whether we wish to live in a technological utopia or risk omnicide, our future is not necessarily predetermined – we are currently creating it.

Key words: autonomous weapons systems, customary international humanitarian law, Article 36

Word count

The text of this paper (excluding table of contents, footnotes, and bibliography) comprises approximately 11,887 words.

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I Introduction

Autonomous weapons systems (AWS) have been tipped as the third revolution in warfare after the second revolution characterized by the nuclear bomb.¹ The contemporary reality of automated weapons are *inter alia* an international law issue due to their ability for use during armed conflict. AWS are of a special nature, bringing about particular issues which challenge the comprehensiveness of the international legal framework that has traditionally been applied to more-conventional weapons. Various established sources of international law such as customary International Humanitarian Law (IHL) and the Geneva Conventions², the Guiding Principles developed by the Group of Governmental Experts on emerging technologies in the area of LAWS (GGE)³, the Marten's Clause⁴, and specific weapons development treaties⁵ are all relevant to the regulation of AWS. The international framework ensures that there are, theoretically, no lacunas in the law, however AWS present new and unique issues which means that the shoe no longer fits well. There is no specific *ad hoc* international law treaty which specially addresses AWS and the particular issues brought about by the development of this modern technology.⁶

¹ "Autonomous Weapons Systems: An Open Letter From AI & Robotics Researchers" (28 July 2015) <<https://futureoflife.org/open-letter-autonomous-weapons/>>.

² *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 226; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) 1125 UNTS 3 (opened for signature 8 June 1977, entered into force 7 December 1978).

³ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems* (CCW, GGE.1/2019/3, 25 September 2019) at Annex IV.

⁴ Hague Convention (IV) Respecting the Laws and Customs of War on Land and Its Annex: Regulations Concerning the Laws and Customs of War on Land (International Conferences (The Hague) TS 403 (entered into force 04 September 1900 and 18 October 1907), Preamble.

⁵ see e.g. 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 (and Protocols) 1342 UNTS 137 (opened for signature 10 April 1981, entered into force 2 December 1983); see also other specific weapons development treaties such as Additional Protocol 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 (Protocol IV, entitled Protocol on Blinding Laser Weapons) 1380 UNTS 370 (opened for signature 10 April 1981, entered into force 30 July 1998).

⁶ William H. Boothby "Highly Automated and Autonomous Technologies" in *New Technologies and the Law in War and Peace* (Cambridge University Press, 2018) 137 at 146.

Concerns as to the level of regulation given to the development and implementation of AWS in armed conflict has featured at the international level since at least 2013.⁷ There is an extensive call for specific international regulation of AWS, for example through a specific international AWS treaty.⁸ New Zealand's stance has historically been that the existing international legal mechanisms are sufficient to deal with the challenges posed by AWS.⁹

Plainly, AWS present new challenges both now and in the future in terms of the law's ability to regulate its development and use. This paper argues that although the legal framework may be applied to AWS, it is deficient in several respects which implores examination of options for reform. Further, that although reform options may go towards solving the new and specific challenges raised by the introduction of AWS, these options cannot fully resolve these challenges. AWS become confronting due to lack of comprehensive regulation, thus calling into question the kind of future we want to have as the underlying technology of AWS grows ever more sophisticated.

This paper shall not seek to address criminal liability, accountability axes, or engage in complex technological discussion of AWS algorithms/mechanics. This paper shall seek to address the following relevant aspects:

- (1) definition of 'autonomous';
- (2) an outline of the existing implicated international law framework and New Zealand's stance as to the appropriateness of the aforementioned framework;
- (3) why the current international framework has deficiencies when specifically applied to AWS;

⁷ Brian Stauffer "Stopping Killer Robots" (10 August, 2020) Human Rights Watch <<https://www.hrw.org/report/2020/08/10/stopping-killer-robots/country-positions-banning-fully-autonomous-weapons-and>>.

⁸ See eg. Bonnie Docherty "Making the Case: The dangers of killer robots and the need for a pre-emptive ban" (9 December 2016) Human Rights Watch <www.hrw.org>; Dale Stephens "Autonomous weapon systems, the law of armed conflict and the exercise of responsible judgment" (2017) Pandora's Box Nov 2017 Issue 2017 1-13; Future of Life Institute, above n 1.

⁹ Government of New Zealand, Statement to the UN General Assembly First Committee on Disarmament and International Security (13 October 2017) <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2017/gge/statements/13Nov_NZ.pdf>.

(4) options for reform at international Law which cannot comprehensively solve all issues.

International law must address the prospect of the future development of AWS, even if this may not be in a comprehensive way. The prospect for future development of AWS truly challenges the bounds of contemporary society, thus soliciting consideration of the kind of future we wish to have.

II Problems of Definition

The preliminary issue in this area lies in that, despite attempts, no internationally agreed definition exists as to what constitutes ‘autonomy’ and how it should be classified in weapons systems.¹⁰ There are various ways in which AWS could be conceived; Harvard PILAC find “current conceptions of autonomy range enormously.”¹¹ For example, AWS may be in the form of “stationary turrets, missile systems, and manner or unmanned aerial, terrestrial or marine vehicles.”¹² This contemplates part of the difficulty of definition; there is a large degree of diversity in what AWS look like, the functions they perform, and their current and future potential for development. This presents an inherent problem in attempting to adequately regulate AWS; how do you regulate something if you don’t know what it is and what it is not? Ultimately, no clear definition of ‘autonomy’ is able to be presented for the purpose of this essay.

Different states have adopted independent definitions of ‘autonomy’.¹³ The current international law framework does not give guidance as to definition, leaving independent states much discretion in independently determining whether the weapons systems that they acquire are ‘autonomous’. States may adopt definitions of AWS which exclude the types of systems they themselves use and develop.

¹⁰*Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects* (International Committee of the Red Cross, Expert Meeting, Geneva, Switzerland, March 2014) at 5.

¹¹ Dustin A. Lewis, Gabriella Blum and Naz K. Modirzadeh “War Algorithm Accountability” (Harvard Law School Program on International Law and Armed Conflict, Research Briefing, August 2016) at iii.

¹² Lewis, Blum and Modirzadeh, above n 11, at vii.

¹³ see various state definitions of what constitutes “autonomy” in Lewis, Blum and Modirzadeh, above n 11, at 21.

‘Autonomy’ may be characterized or explained in three different ways:¹⁴

- (1) by reference to the *human-machine relationship* (the degree of human control);
- (2) by reference to the machine’s *decision-making process*; or
- (3) explained by the *types of decisions or functions* of the machine which have been made autonomous.

It is clear that each form of characterization focuses the study of definition to different but related areas; we may focus on the degree of human navigation in the system, the type of command given to the system, or the way the system ‘chose’ a certain action/inaction. ‘Autonomy’ is a sliding scale - there are degrees of it. By focusing on only one characterisation above, states are more conveniently able to argue that they do not have the current capacity for AWS. For example, France focusses solely on characterisation (1) to contend that AWS are only those which are fully autonomous; if there is any degree of human supervision, then the system will not be ‘autonomous’.¹⁵ Contrastingly, America’s definition of autonomy blends the characterizations but still places emphasis on human control. They find an AWS is a system that “once activated, can select and engage targets without further intervention by a human operator ... [including those] designed to allow human operators to override operation”.¹⁶ The latter definition is preferable and more realistic to the current iterations of the technology because all AWS currently in use have some degree of human ‘on the loop’.¹⁷ Indeed, leading scholar Gary Solis gives preference to America’s interpretation of ‘autonomy’ as a “capability (or a set of capabilities) that enables a particular action of a system to be automatic or, within programmed boundaries, ‘self-governing’”.¹⁸ Although characterisation of a weapons system as either an AWS or non-AWS would *prima facie* be immaterial in the sense that all weapons will be assessed

¹⁴ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 14; US Department of Defense (2012) *Autonomy in Weapon Systems*, Directive 3000.09, 21 November 2012, Glossary, Part II Definitions.

¹⁵ Government of France “Characterization of a LAWS” (CCW, non-paper, April 11-15, 2016) <[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/5FD844883B46FEACC1257F8F00401FF6/\\$file/2016_LAWSMX_CountryPaper_France+CharacterizationofaLAWS.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/5FD844883B46FEACC1257F8F00401FF6/$file/2016_LAWSMX_CountryPaper_France+CharacterizationofaLAWS.pdf)>.

¹⁶ US Department of Defense *Autonomy in Weapons Systems* (21 November 2012, Dir. 3000.09) at 13-14.

¹⁷ Defense Science Board *Task Force Report: The Role of Autonomy in DoD Systems* (Department of Defense, D.C. 20301-3140, July 2012) at 1.

¹⁸ Defense Science Board, above n 17, at 1; Gary D. Solis *The Law of Armed Conflict: International Humanitarian Law in War* (2nd ed, Cambridge University Press, New York, 2016) at 536.

under the general international law framework, state discretion as to characterisation does have consequences in terms of synchronisation and consensus on legal reform.

Overall, it appears from the information available that the kind of AWS in use today do incorporate significant degrees of ‘autonomy’.¹⁹ However, they are often used in circumstances which are limited by either:²⁰

- (1) a high degree of fixation and/or
- (2) placement in controlled environments and/or
- (3) use being limited to against other non-human military objects.

Some of the concerns which arise about the use of AWS are not going to be so abundant if the geographic and/or temporal scope of the use of AWS is limited in some way. For example, if an AWS is placed in a desert where there are no civilians then the natural inclination is there is less risk of adverse consequence.²¹ Ultimately, the way that AWS are currently used is not unlimited, and so the ways in which they are used will incorporate lesser/greater degrees of autonomy beyond just the capability of the system generally to act autonomously. This implicates characterization (3) i.e. the types of function and decisions given to the machine. Any decision as to whether a system is autonomous or not can therefore be somewhat compartmentalised in terms of the specific circumstances where the weapons system is currently used and whether those are limited in some capacity. Nevertheless, the ways in which AWS are currently limited in circumstance also differs greatly from system-to-system.²² Any examination of the system’s circumstantial use must be accompanied with the capabilities of the system more generally (i.e. characterisations (1) and (2)) because this involves consideration of the way the system could be used in the future.

¹⁹ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 21; Peter Asaro “On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making” (2012) 94 IRRC 687 at 690.

²⁰ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 14.

²¹ Jeffrey S. Thurnher “Feasible Precautions in Attack and Autonomous Weapons” in Wolff Heintschel von Heinegg, Robert Frau, Tassilo Singer (eds) *Dehumanization of Warfare* (Springer, Switzerland, 2018) 99 at 115; Solis, above n 18, at 539.

²² Lewis, Blum and Modirzadeh, above n 11, at vii.

Overall it has been demonstrated that, although there are various ways in which AWS may be characterised, no clear definition can be presented as to what constitutes ‘autonomy’.²³

III International law framework applied to AWS

International law already places limits on a states’ ability to choose both their means and methods of warfare.²⁴ Notwithstanding the unique elements of AWS in contrast to perceived ‘traditional’ systems, it will be the existing legal principles and rules which provide the parameters of lawfulness of any weapon, which of course includes AWS.²⁵ This paper will therefore outline the most relevant already-established frameworks which are to be determinative of the lawfulness of AWS in either their development or their use in armed conflict.

A International Humanitarian Law

IHL applies to the use of AWS just as it would any other weapons system.²⁶ IHL binds all parties to armed conflict.²⁷ The goal of IHL is to protect non-participants in hostilities as well as regulate the way conflict is conducted.²⁸ A state’s choice to use a particular weapon and the way this weapon is used is not unlimited, and the degree of limitation will vary depending on circumstance.²⁹

IHL has dual sources: it exists both treaty law and custom when a treaty does not apply to the specific situation at hand.³⁰ As noted by the International Court of Justice:³¹

²³ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 14

²⁴ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997* (International Review of the Red Cross, Volume 88 No. 864, December 2006) at 931.

²⁵ Boothby, above n 6, at 145.

²⁶ Solis, above n 18, at 539.

²⁷ Lewis, Blum and Modirzadeh, above n 11, at 64.

²⁸ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 932.

²⁹ Hague Convention (IV) 1907, above n 4, art 22.

³⁰ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 75.

³¹ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 75.

these two branches of the law [treaty and custom] ... have become so closely interrelated that they are considered to have gradually formed one single complex system, known today as international humanitarian law.

The result is that, even if a state has not ratified a particular treaty which contains IHL, they will still be bound by IHL generally because the fundamental rules of IHL “constitute intransgressible principles of international customary law.”³² The International Court of Justice cites the following cardinal principles of IHL, these being distinction, proportionality, military necessity and the prohibition on causing unnecessary harm.³³ Accordingly, all states must observe these principles in armed conflict or they will be acting unlawfully.³⁴

1 Unnecessary Suffering and Military Necessity

Means of warfare which result in unnecessary suffering to combatants are prohibited.³⁵ Pursuant to API, “[i]t is prohibited to employ weapons ... and material and methods of warfare of a nature to cause superfluous injury and unnecessary suffering.”³⁶ In this sense the choices states make in terms of electing to use a particular weapon is not an unlimited one.³⁷ Note that this principle looks solely at the effect of the weapon itself, and not on the manner of its engagement.³⁸ In this sense, this principle will determine whether a weapon (here AWS) is lawful *per se*, but AWS may still be determined unlawful based on a particular prospective use by parties during armed conflict.³⁹ Unnecessary suffering and military necessity have a lower threshold for compliance than proportionality and distinction.⁴⁰

³² *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 79.

³³ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

³⁴ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 79.

³⁵ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

³⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 35(2).

³⁷ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

³⁸ Lewis, Blum and Modirzadeh, above n 11, at 72.

³⁹ Lewis, Blum and Modirzadeh, above n 11, at 72.

⁴⁰ Solis, above n 18, at 541.

AWS may not comply with the principle of unnecessary suffering. Firstly, an AWS cannot itself feel pain because it is a machine. It cannot comprehend pain and therefore cannot factor this into decision-making about the degree of suffering it will inflict when it employs a particular degree of force. As humans personally experience physical and psychological pain, this usually causes them to adopt natural psychological processes where they will consider limiting the amount of pain they inflict on others.⁴¹ The ability of others to cause us pain and our ability to inflict pain on others creates a dynamic of reciprocity, this dynamic being cross-cultural and transcending borders.⁴² We do not want to do to any enemy what we don't want the enemy to do to us. But how can a non-human entity like an autonomous machine indirectly comprehend this physical or psychological pain felt in humans?

Even further, an AWS is generally impervious to consideration of the consequence of applying a certain degree of force. When faced with a choice between wounding or killing a combatant, a human may respond in a way which limits the degree of force used because *inter alia* humans understand the inherent value in life itself.⁴³ Again, this leads to the argument for limited use of AWS in controlled environments which do not demand moral competence.⁴⁴ Russell Christian argues, “emotional capacity is vital in situations where determinations about the use of force are made.”⁴⁵ Peter Asaro claims that IHL “explicitly requires combatants to reflexively consider the implications of their actions, and to apply compassion and judgement in an explicit appeal to their humanity.”⁴⁶ Yoram Dinstein confers that “a total lack of any emotions is liable to become a downside rather than an upside.”⁴⁷ AWS could be seen as allowing some level of dangerous detachment from arguably violent situations – war shouldn't be ‘easy’.

⁴¹ Russell Christian, “Heed the Call: A Moral and Legal Imperative to Ban Killer Robots” (21 August 2018) Human Rights Watch <<https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots>> at IV.

⁴² ICRC *The Fundamental Principles of the Red Cross and Red Crescent* (ICRC, ref. 0513, 1996) at 2.

⁴³ Christian, above n 41, at Summary.

⁴⁴ Amanda Sharkey “Can We Program or Train Robots to be Good?” (2017) *Ethics Inf Technol*.

⁴⁵ Christian, above n 41, at IV.

⁴⁶ Asaro, above n 19, at 700.

⁴⁷ Yoram Dinstein “Autonomous Weapons and International Humanitarian Law” in Wolff Heintschel von Heinegg, Robert Frau, Tassilo Singer (eds) *Dehumanization of Warfare* (Springer, Switzerland, 2018) 15 at 19.

However, there are arguments which go towards current technological conceptions of AWS having the capacity to comply with the principle of unnecessary suffering. Some scholars question the extent to which emotions like empathy are necessary in assessing the degree of suffering inflicted, as empathy is itself subject to bias and is not necessarily a motivating factor in decision-making made by humans.⁴⁸ Gary Solis, one of America’s leading scholars on military conflict, interestingly does not even explore this discussion on emotional capacity/a lack of it and its connection with the degree of suffering inflicted. Instead, Solis finds the prohibition on unnecessary suffering is a “relatively low threshold for autonomous weapons systems to overcome”, it being “most unlikely” that AWS would be unlawful *per se* on this basis.⁴⁹ Solis potentially makes this finding because all AWS currently in use have some element of a man ‘on the loop’, which obviously brings some element of human judgment into decisions as to the degree of force to be used in a particular circumstance. William Boothby goes even further, claiming that unnecessary suffering “is unlikely to be relevant to the legal acceptability of the ‘man on the loop’ aspect of such a weapon system that is to be used to undertake attacks.”⁵⁰ Nevertheless, when contemplating future developments in AWS and the natural imperative for states to develop and employ ‘off the loop’ systems on the basis of efficiency and military utility, the status of the lawfulness of AWS on the basis of unnecessary suffering becomes more troublesome because the parameters of a future machine’s understanding of life and pain are unable to be contemporarily measured.⁵¹

Military necessity, like unnecessary suffering, is generally a relatively low standard to satisfy.⁵² It is the most general and broad of the principles, generally meaning that a state may “do anything that is not unlawful to defeat the enemy”.⁵³ The principle means that states may only doing what it takes to ‘win’ and nothing more, and there must be some

⁴⁸ Jesse J. Prinz “Is empathy necessary for morality?” in Amy Coplan and Peter Goldie (eds) *Empathy: Philosophical and psychological perspectives* (Oxford University Press, Oxford, 2011) 211 at 213.

⁴⁹ Solis, above n 18, at 541.

⁵⁰ Boothby, above n 6, at 139.

⁵¹ Christian, above n 41, at 2.

⁵² Solis, above n 18, at 541.

⁵³ Solis, above n 18, at 278.

military advantage to be gained from taking a particular action.⁵⁴ Military necessity encompasses the idea of securing submission with the “least possible expenditure of time, life and money”.⁵⁵ Francis Lieber wrote military necessity “consists in the necessity of those measures which are indispensable for securing the ends of war, and which are lawful according to the modern law and usages of war.”⁵⁶ In other words, the means used should not be greater than needed to “carry out a military operation”.⁵⁷ Because of the nature of the principle, it has obvious links with the principles of unnecessary suffering and proportionality.⁵⁸ Military necessity is not codified but it is a peremptory norm of international law.⁵⁹

There are compelling arguments towards AWS satisfying the principle of military necessity. Gary Solis quickly discounts any analysis of why AWS may not satisfy this principle.⁶⁰ This is because the value in using AWS is clearly discernible. We can envision particular circumstances where AWS may in fact be *preferable*; for example in reducing loss of human life in armed conflict.⁶¹ This is indeed one of the main arguments for the use of AWS in armed conflict; AWS may actually be more humane in particular circumstances as it has the potential to ultimately spare human life by lessening the human element in conflict scenarios.⁶² However this will not always be the case; we can also envisage circumstances where the human element in war is still high despite the use of AWS. For example, innocents may be at risk when AWS are deployed in urban areas.⁶³

⁵⁴ *Prosecutor v Stanilav Galic (Trial Judgement and Opinion)* ICTY Trial Chamber IT-98-29-T, 5 December 2003 at fn. 76.

⁵⁵ The United Nations War Crimes Commission *Law Reports of Trials of War Criminals* (1949) VIII at 34-76.

⁵⁶ U.S. War Department General Orders No. 100 (April 24 1863).

⁵⁷ Frederic de Mulinen “Handbook of the Law of War for Armed Forces” (Geneva, ICRC, 1987) at 352.

⁵⁸ Solis, above n 18, at 277.

⁵⁹ Yves Sandoz, Christophe Swinarski, and Bruno Zimmermann *Commentary on the Additional Protocols* (Geneva, Martinus Nijhoff, 1987) at 585; Solis, above n 26, at 278.

⁶⁰ Solis, above n 18, at 541.

⁶¹ Gary E. Marchant and others “International Governance of Autonomous Military Robots” (2011) 12 *Colum. Sci. & Tech. L. Rev.* 1 at 3.

⁶² Gregory P. Noone and Dianna C. Noone “The Debate Over Autonomous Weapons Systems” (2015) 47 *Case West Reserve J Int Law* 25 at 26.

⁶³ United Nations Security Council *Protection of Civilians in Armed Conflict* (Report of the Secretary-General, 20-06473, May 2020) at page 9.

Overall, there are no clear cut answers at international law as to whether AWS generally comply with the principles of unnecessary suffering and military necessity.

2 *Distinction*

The principle of distinction is the most significant principle of IHL.⁶⁴ It applies in all forms of conflict.⁶⁵ It is a dual principle. Firstly, the methods and means of warfare which do not distinguish between civilians and combatants are prohibited at international law.⁶⁶ The International Court of Justice described the principle of distinction and the protection of civilians as “the cardinal principles contained in the texts constituting the fabric of humanitarian law”.⁶⁷ As per API, “parties to a conflict shall at all times distinguish between the civilian population and combatants and civilian objects and military objectives.”⁶⁸ An underlying purpose of the law of armed conflict is to protect those who cannot protect themselves i.e. civilians.⁶⁹ Combatants are generally considered to be legitimate targets in armed conflict whereas civilians are not.⁷⁰ It is inherent in the principle of distinction that there is a duty to “take reasonable steps” in determining whether a target is legitimate or illegitimate.⁷¹

As of yet, no fully AWS has the capability to autonomously distinguish a civilian from a combatant.⁷² Because of this, any AWS absent meaningful human control will be unable to satisfy the principle of distinction, and will subsequently breach IHL. However, no fully autonomous system has been developed yet, and any AWS currently in use are usually placed in circumstances which are limited by some relevant factor which makes the use of

⁶⁴ Solis, above n 21, at 269.

⁶⁵ Solis, above n 21, at 272.

⁶⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 6, art 48; *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

⁶⁷ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

⁶⁸ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 48. See also articles 51.1 and 51.2.

⁶⁹ Noone and Noone, above n 62, at 29.

⁷⁰ Judith Gardam *Necessity, Proportionality and the Use of Force by States* (Cambridge University Press, Cambridge, 2004) at 14.

⁷¹ Christopher Greenwood “Customary Law Status of the 1977 Geneva Protocols” in Astrid J. M. Delissen and Gerard J. Tanja (eds) *Humanitarian Law of Armed Conflict Challenges Ahead* (Dordrecht, Martinus Nijhoff, 1991) at 109.

⁷² Kenneth Anderson, Daniel Reisner, and Matthew Waxman “Adapting the Law of Armed Conflict to Autonomous Weapon Systems” (2014) 90 Int’l L. Studies 386 at 389; Solis, above n 18, at 539.

the weapon more likely to be IHL-compliant.⁷³ Further, if a fully AWS were developed, it would be subject to weapons review under Article 36 which *inter alia* empowers consideration of the principle of distinction (note that weapons review will be further elucidated under sub-heading 4).

On this issue Peter Asaro finds “while it would indeed be advantageous to enhance the protection of civilians and civilian property in future armed conflicts, we must be careful about the inferences we draw from this with regard to permitting the use of [AWS].”⁷⁴ AWS are complex systems, therefore fallible and capable of making error in distinction.⁷⁵ However it is also argued by some scholars that human error is also frequent in armed conflict, and that AWS may have the capacity to be more accurate than humans.⁷⁶ Human beings are prone to emotions which such as fear, stress, fatigue, and self-preservation, these emotive elements not being something an autonomous weapon is currently capable of possessing.⁷⁷ The argument follows that AWS has the potentiality to remove some of the unpredictability of human behaviour from armed conflict spaces.⁷⁸

However, military personnel may be prone to rely wholeheartedly on information provided by autonomous systems without giving due consideration to the notion that AWS are not failsafe and are also prone to limitation. Technology incorporating autonomy may be misleading to commanders in some cases, this problem being particularly inflated when the situation is time-pressured.⁷⁹ AWS are technological systems and thus have particular weaknesses which are not inherent in human beings. This is seen for example in breakdowns, hacking, malfunction, and glitches, which may mean that we cannot be sure

⁷³ Solis, above n 18, at 536; *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 14

⁷⁴ Asaro, above n 19, at 697.

⁷⁵ Max Tegmark *Life 3.0 Being Human in the Age of Artificial Intelligence* (Penguin Books, United Kingdom 2018) at 112; Solis, above n 21, at 540; Georg Heppner and Ruediger Dillmann “Autonomy of Mobile Robots” in in Wolff Heintschel von Heinegg, Robert Frau, Tassilo Singer (eds) *Dehumanization of Warfare* (Springer, Switzerland, 2018) 77 at 96.

⁷⁶ Ronald Arkin “The Case for Ethical Autonomy in Unmanned Systems” (2010) 9 J. Mil. Ethics 332, 332-339; Justin McClelland “The review of weapons in accordance with Article 36 of Additional Protocol I” (2003) 85 RICR 397 at 408-409.

⁷⁷ Noone and Noone, above n 62, at 29; Asaro, above n 19, at 703.

⁷⁸ Noone and Noone, above n 62, at 30.

⁷⁹ Tegmark, above n 75, at 111.

that AWS will make accurate distinction when specifically programmed to carry out a certain task.⁸⁰ For example, in 1983 an automated Soviet early-warning system alerted Officer Stanislav Petrov that America had launched five nuclear missiles at the Soviet Union.⁸¹ This information turned out to be incorrect as the automated system had mistaken reflections from the Sun off cloud tops as flames from nuclear rockets.⁸² Had Officer Petrov not followed his intuition and chosen instead to follow pre-determined protocol then the results would have been disastrous; nuclear war would have likely resulted.⁸³ This tentative example serves to show that over-reliance on information provided by human ‘on the loop’ AWS may have adverse consequences, particularly in the case of resulting in mistaken distinctions.

The second aspect of the principle of distinction is that attacks may only be directed at military objectives and not civilian objects.⁸⁴ Authors note that AWS do have a better capability to distinguish civilian objects from military objectives because sensors can be programmed via algorithm to detect pre-determined categories of military equipment.⁸⁵ Though, this element of distinction rests on the preservation of property, this being arguably less important than the civilian versus combatant distinction which seeks to prevent loss of human life, the satisfaction of the latter being a greater point of contention in terms of the use of AWS.

A further issue in terms of the principle of distinction lies in the wording of API itself: it obligates “combatants” to distinguish themselves from civilians.⁸⁶ However, can it really be said that an AWS is a ‘combatant’? Hin-Yan-Liu argues that AWS are to be conceived

⁸⁰ Gregory P. Noone and Dianna C. Noone, above n 30, at 33.

⁸¹ Dylan Matthews “36 years ago today, one man saved us from world-ending nuclear war” *Vox* (online ed, Washington DC, 26 September 2019).

⁸² Tegmark, above n 74, at 113.

⁸³ Matthews, above n 81.

⁸⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 48; Jean-Marie Henckaerts and Louise Doswald-Beck *Customary International Humanitarian Law Vol. I. Rules* (Oxford: Oxford University Press, 2005) at 25.

⁸⁵ Solis, above n 18, at 539.

⁸⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 44.3

as something more than just a ‘weapon’; that the “capacity for autonomous decision-making pushes these technologically advanced systems to the boundary of the notion of ‘combatant’.”⁸⁷ This issue remains unresolved at law.

Ultimately it is not made clear that both current and future formations of AWS can in fact satisfy the distinction principle.⁸⁸

3 *Proportionality*

States must not cause harm greater than that which is unavoidable to achieve legitimate military objectives. API prohibits attacks which:⁸⁹

may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination therefore, which would be excessive in relation to the concrete and direct military advantage anticipated.

The proportionality principle is based on humanitarian considerations.⁹⁰ Whether an action is proportionate is both an objective and subjective question, requiring context-dependent judgements of the conflict situation at hand.⁹¹ In its most general sense, proportionality requires that the concrete and direct military advantage gained by a particular action be balanced against the consideration of what would be ‘excessive’ loss of civilian life.⁹² Proportionality operates offensively and defensively.⁹³ The proportionality principle does not operate to the extent that it prevents civilian casualty altogether; sometimes there are situations where there is no particular military advantage to be gained from taking action to protect civilians during an armed conflict.⁹⁴ Protecting civilians may even put a state’s

⁸⁷ Hin-Yan Liu “Categorization and Legality of Autonomous and Remote Weapons Systems” (2012) 94 Int’l Rev. Red Cross 627 at 636.

⁸⁸ see e.g. United Nations Security Council, above n 63, at 37.

⁸⁹ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, articles 51(5)(b) and 57(2)(a)(iii).

⁹⁰ Gardam, above n 70, at 17.

⁹¹ Solis, above n 18, at 540.

⁹² Solis, above n 18, at 294; Protocol I, above n 6, art 51(5)(b).

⁹³ Solis, above n 18, at 295.

⁹⁴ Gardam, above n 70, at 18; Solis above n 18, at 294.

combatants at risk.⁹⁵ Proportionality operates on three planes of action: selection of target(s), the means and methods of attack, and the conduct of the attack itself.⁹⁶ For example, in preparing an attack, military personnel must take all feasible precautions to minimize incidental losses and consider holistically whether the attack would be disproportionate.⁹⁷ If in preparations it becomes clear that such an attack would result in disproportionate outcomes then the attack should either be suspended or cancelled.⁹⁸

Given that no AWS currently has independent intelligence capability (which could perhaps in the future allow it to gauge the military advantage to be gained from a determined action), it seems plausible that there are significant barriers to compliance with the proportionality principle due to the machine's inability to make genuine consideration of proportional advantage.⁹⁹ Satisfaction of this principle largely relies on the ability to perceive a conflict situation, apply various qualitative 'human' values to it so as to determine what a proportional response would be, and react accordingly in a manner that is determined as proportional to the perceived military advantage. As the current iteration of the technology stands, any machine would have to be programmed in advance of a proportionality-issue scenario.¹⁰⁰ Programming an AWS with pre-determined responses is unlikely to achieve proportional outcomes as each conflict situation is arguably unique and particular. Heppner and Dillmann highlight this predicament: "even if all the sensors work perfectly (which is unlikely) and every algorithm produces the perfect result (which is, given the uncertainties, almost impossible) we would end up with a decision that is based on a formal definition that was given in advance."¹⁰¹ Marco Sassòli states, "[a] machine, even if perfectly programmed, could ... not be left to apply the proportionality principle unless constantly updated about military operations and plans."¹⁰² This is neither time

⁹⁵ Ibid.

⁹⁶ Solis, above n 18, at 294-295.

⁹⁷ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, arts 57(2)(b) and 72(2)(a)(iii).

⁹⁸ Gardam, above n 70, at 97.

⁹⁹ Christian, above n 41, at IV.

¹⁰⁰ Christian, above n 41, at IV.

¹⁰¹ Heppner and Dillmann, above n 75, at 96.

¹⁰² Marco Sassòli "Autonomous Weapons and International Law: Advantages, Open Technical Questions and Legal Issues to Be Clarified" (2014) 90 Int'l L. Studies 308 at 332.

efficient or practicable, highlighting an issue point with the use of AWS and compliance with the proportionality principle.

According to Solis, “proportionality often involves what is euphemistically referred to as “collateral damage””.¹⁰³ There are arguments that AWS have greater competence in minimising collateral damage than humans on the basis that AWS have greater precision facility.¹⁰⁴ This means that AWS may cause less incidental damage to both civilians and civilian objects, which, in balancing, necessitates less of a need for a profound military objective/advantage to satisfy a proportionality assessment. Although a military objective must always be concrete and direct (as opposed to, say, some kind of cumulative advantage.¹⁰⁵), the advantage arguably needs to be less cogent if an attack is carried out with complete precision as this naturally minimises civilian loss.¹⁰⁶

Despite cogent arguments that AWS have potential to reduce collateral damage, much of the scholarship rests on the idea that, unless there is meaningful human control, AWS cannot satisfy the proportionality principle because the principle itself requires complex considerations which cannot be pre-programmed – they must happen in real time. At present there is academic consensus that a proportionality test is only one that “a human brain can properly undertake.”¹⁰⁷ Yoram Dinstein argues that even humans struggle in making collateral damage decisions, so how can an AWS be expected to make decisions as to what is excessive and what is not?¹⁰⁸ Though, some scholars remain open to the possibility that fully autonomous systems may be lawfully used in particular circumstances in the future.¹⁰⁹ Nevertheless, at present no human-independent technological mechanisms

¹⁰³ Solis, above n 18, at 295.

¹⁰⁴ Jonah M. Kessel “Killer Robots Aren’t Regulated. Yet.” *The New York Times* (online ed, 13 December 2019).

¹⁰⁵ Gardam, above n 78, at 101.

¹⁰⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 6, art 51(5)(b).

¹⁰⁷ Solis, above n 18, at 541.

¹⁰⁸ Dinstein, above n 47, 19.

¹⁰⁹ Bill Boothby “How Far will the Law Allow Unmanned Targeting to Go?” Dan Saxon (ed) *International Humanitarian Law and the Changing Technology of War* (Leiden, Martinus Nijhoff, 2013) 45 at 57.

have been developed which would allow AWS to satisfy the proportionality requirement in particular.¹¹⁰

Overall, the intersection of customary principles of distinction, proportionality, unnecessary suffering and military necessity set the legal parameters for using AWS during armed conflict. IHL provides no clear cut answers as to whether current conceptions of AWS may be used lawfully during armed conflict. Article 36 of Additional Protocol I (API) empowers consideration of compliance of *new* weapons systems with IHL.¹¹¹ As Article 36 is the primary legal mechanism that will be used to assess future developments of AWS it is central to this thesis and will be analysed as follows.

B Article 36 Weapons Review

Article 36 of API imposes obligations on states concerning “the study, development, acquisition or adoption of a new weapon, means or method of warfare”.¹¹² In other words, the art deals with all stages of a new weapon coming into existence and its practical continuance; from design, to use, to any potential development.¹¹³ States who are not High Contracting Parties to API are still under an implied obligation to conduct review of new weapons.¹¹⁴ The International Committee of the Red Cross (ICRC) stress “the weapon’s effects will result from a combination of its design *and* the manner in which it is to be used.”¹¹⁵ Article 36 itself obligates states to determine whether a new weapons system would comply with customary principles of IHL and any other rule of international law which is applicable to the state party undertaking review.¹¹⁶ Therefore, this provision is going to be central to any analysis of the provisions made at international law for the testing

¹¹⁰ Solis, above n 18, at 541; Christian, above n 49.

¹¹¹ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36; *Manual of Armed Forces Law* New Zealand Defence Force (DM 69 2nd ed, vol 4) 7.4.6.

¹¹² Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 6, art 36.

¹¹³ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare*, above n 24, at 952.

¹¹⁴ William Boothby “Dehumanization: Is There a Legal Problem Under Article 36?” in Wolff Heintschel von Heinegg, Robert Frau, Tassilo Singer (eds) *Dehumanization of Warfare* (Springer, Switzerland, 2018) 21 at 22.

¹¹⁵ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare*, above n 24, at 945.

¹¹⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 6, art 36; Boothby, above n 6, at 145.

of any prospective AWS for compliance with international law.¹¹⁷ In this sense, the degree of compliance of new weapons systems can only be tested on the legal principles already in existence. Any weapon which is autonomous to some degree will thus be subject to the same four core IHL principles as any other weapons system, these being distinction, proportionality, military necessity and unnecessary suffering.¹¹⁸

C GGE Guiding Principles

Under the auspices of the Convention on Certain Conventional Weapons (CCW), the 2019 Convention on Certain Conventional Weapons Meeting of High Contracting Parties resulted in the development of soft law in the form of 11 guiding principles which are to specifically apply to AWS.¹¹⁹ These 11 guiding principles were endorsed by New Zealand.¹²⁰ Some of these principles seek to add colour to the already-existing IHL principles hence why they are to be listed. Such principles being:¹²¹

- (c) Human-machine interaction, which may take various forms and be implemented at various stages of the life cycle of a weapon, should ensure that the potential use of weapons systems based on emerging technologies in the area of lethal autonomous weapons systems is in compliance with applicable international law, in particular IHL. In determining the quality and extent of human-machine interaction, a range of factors should be considered including the operational context, and the characteristics and capabilities of the weapons system as a whole;
- (f) When developing or acquiring new weapons systems based on emerging technologies in the area of lethal autonomous weapons systems, physical security, appropriate non-physical safeguards (including cyber security against hacking or data spoofing), the risk of acquisition by terrorist groups and the risk of proliferation should be considered;

¹¹⁷ Solis, above n 18, at 538.

¹¹⁸ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I); above n 5; Solis, above n 18, at 539.

¹¹⁹ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at Annex IV.

¹²⁰ *Meeting of the High Contracting 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 'Final report'* (CCW, MSP/2019/9, 13 December 2019) at 31.

¹²¹ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at Annex IV.

- (i) In crafting potential policy measures, emerging technologies in the area of lethal autonomous weapons systems should not be anthropomorphized;
- (j) Discussions and any potential policy measures taken within the context of the CCW should not hamper progress in or access to peaceful uses of intelligent autonomous technologies;
- (k) The CCW offers an appropriate framework for dealing with the issue of emerging technologies in the area of lethal autonomous weapons systems within the context of the objectives and purposes of the Convention, which seeks to strike a balance between military necessity and humanitarian considerations.

Overall, the guiding principles seek to minimise harm to the development of beneficial emerging technologies whilst dually providing further guidance as to how contracting parties can best comply with their obligations at international law when they acquire and employ AWS. However, it is debatable whether the 11 guiding principles in their totality actually add anything to the aforementioned legal rules.¹²² Richard Moyes criticises the principles on the basis that they are too narrow, claiming they do not articulate the more complex issues or solve any of the long-standing debates around the legality of the use of AWS.¹²³

D Martens Clause as a Last Resort?

The modern incantation of the clause can be found in art 1 of API:¹²⁴

in cases not covered by this Protocol or by other international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience.

¹²² Dustin Lewis “An Enduring Impasse on Autonomous Weapons” (28 September 2020) Just Security <justsecurity.org/72610/an-enduring-impasse-on-autonomous-weapons/>; Richard Moyes *Critical Commentary on the “Guiding Principles”* (Article36, Policy Note, November 2019) at 1.

¹²³ Moyes, above n 122, at 1-4.

¹²⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 1. See also origin of Clause in Hague Convention (IV), above n 4, Preamble.

The International Court of Justice has stressed the importance of this clause “whose continuing existence and applicability is not doubted”.¹²⁵ In the Court’s view, the Martens Clause “has proved to be an effective means of addressing the rapid evolution of military technology.”¹²⁶ The Martens Clause has been consistently cited in discussions of AWS during CCW meetings.¹²⁷

In theory, the effect of the Martens Clause is to prevent any lacunas in the international law framework which is subsequently applied to weapons systems, including AWS.¹²⁸ This theoretically necessitates that, absent IHL being able to adequately apply to AWS, the Martens Clause empowers an assessment of the legality of AWS on the principles of “humanity” and the “dictates of public conscience”.¹²⁹ Michael Schmitt argues the Martens Clause is a failsafe mechanism so that, even when a particular new weapon is not covered by any specific law, international norms invariably still apply.¹³⁰ On this basis, even if a state wishes to develop AWS without any regulation and so does not ratify any treaty containing the Clause, they will still be touched by the Clause because of its “intransgressible” nature.¹³¹ The Clause clearly applies in the context of AWS¹³², but the degree of its legal efficacy in the context of regulating AWS is not so transparent.

Russel Christian argues that the Martens Clause creates a “moral standard” with which to judge AWS, claiming that fully autonomous weapons i.e. those without meaningful human control would invariably breach both prongs of the Martens Clause.¹³³ Antonio Cassese adopts an approach of scepticism about the Clause’s legal potency partly due to its

¹²⁵ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 87.

¹²⁶ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78.

¹²⁷ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at Annex III.

¹²⁸ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 92.

¹²⁹ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 1; *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 92.

¹³⁰ Michael Schmitt “Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics” (2012) NSJ: Features Online at 32.

¹³¹ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 78; Boothby, above n 6, at 146.

¹³² Christian, above n 41.

¹³³ Christian, above n 41.

“ambiguous and evasive” nature which results in clashing and inimical interpretations.¹³⁴ Cassese essentially argues that the Martens Clause has been used at international law *ad abundantiam* to reinforce conclusions reached on the basis of delineated core IHL principles, but that it has not been given stand-alone legal force.¹³⁵

E New Zealand’s stance on AWS and the current legal framework

New Zealand has adopted a somewhat conservative view in addressing the threat of AWS. This likely has various causes, including the fact that New Zealand is a small international player and could be characterised as a follower in development of military technology. Though, New Zealand does have a stake in developing this kind of technology, seen for example with X-craft Enterprises, a New Zealand company specialised in the development of robotics. X-craft were the first New Zealand name on the open letter supporting an international ban on AWS, the founder’s name appearing next to Elon Musk’s.¹³⁶ Just this year New Zealand developed the Algorithm charter for Aotearoa New Zealand, the goal of the Charter being to ensure the safe use of algorithms by public agencies.¹³⁷ Notably, two of founding signatories to the Charter are the New Zealand Defence Force and The Ministry for Foreign Affairs and Trade.¹³⁸ As previously stated, Harvard PLS view one requirement for the existence of ‘autonomy’ in a machine being an “algorithm expressed in computer code”¹³⁹ so it is tenable that the obligations under the Charter should be considered by these agencies in foreign policy engagement and/or development of any prospective AWS.

The New Zealand Law of Armed Conflict Military Manual briefly accounts for AWS, stating that the principles of law of armed conflict apply to “all potential technology available for military use, including ... robotic weapons and weapons with artificial

¹³⁴ Antonio Cassese “The Martens Clause: Half a Loaf or Simply Pie in the Sky?” (2000) 11 EJIL 187 at 189.

¹³⁵ Cassese, above n 134, at 205-206.

¹³⁶ Madison Reidy “First NZ company stands against killer robots, fires at Government for weapon policy reform” *Stuff* (online ed, 27 Aug 2017); Future of Life Institute, above n 1.

¹³⁷ New Zealand Government *Algorithm charter for Aotearoa New Zealand* (July 2020) <<https://data.govt.nz/use-data/data-ethics/government-algorithm-transparency-and-accountability/algorithm-charter/>>; Charlotte Graham-McLay “New Zealand claims world first in setting standards for government use of algorithms” *The Guardian International ed.* (online ed, Wellington, 27 July 2020).

¹³⁸ New Zealand Government, above n 137.

¹³⁹ Lewis, Blum and Modirzadeh, above n 11, at 15.

intelligence.”¹⁴⁰ The aforementioned international law framework is deemed appropriate in setting limits on AWS.¹⁴¹ New Zealand’s focus is on using this *existing* law “to make sure there will always be meaningful human control over weapons incorporating autonomy.”¹⁴² Simply, New Zealand’s present view is that if an AWS does not comply with the aforementioned core principles of IHL (proportionality, distinction, and precautions in an attack) then it would be unlawful.¹⁴³ This implies New Zealand views IHL principles as a suitable and sufficient legal regulation on the development of AWS.

New Zealand has also expressed strong concern about the development of AWS, which is somewhat at odds with the aforementioned stance that the law provides complete and appropriate safeguards. If we take the position that the law is complete then this should feasibly abate major concerns. In 2019, Minister for Disarmament and Arms Control Winston Peters said, “New Zealand has been very clear that we have concerns about the legal, ethical and human rights challenges posed by the development and use of lethal autonomous weapons systems.”¹⁴⁴ The Minister went on to emphasize meaningful human control as central, stating, “the ability to exercise human control is critical as to whether a weapon would be able to comply with international humanitarian law as well as other legal requirements.”¹⁴⁵ The Minister views the use of API art 36¹⁴⁶ weapons reviews as a legal mechanism capable of ensuring that all new weapons will incorporate meaningful human control i.e. remain ‘on the loop’.¹⁴⁷ New Zealand’s procedure for review of new weapons is reflected in 7.4.1 of the Military Manual.¹⁴⁸

Overall, it is clear that New Zealand has expressed concerns over the future development of AWS. New Zealand has participated in every international Convention on Certain

¹⁴⁰ Zealand Defence Force, above n 111, at 7.4.6.

¹⁴¹ Government of New Zealand, above n 9.

¹⁴² Government of New Zealand, above n 9.

¹⁴³ Letter from Rt Hon Winston Peters (Minister for Disarmament and Arms Control) to Mary Wareham (Campaign to Stop Killer Robots) regarding New Zealand’s stance (1 May 2019).

¹⁴⁴ Letter from Rt Hon Winston Peters, above n 143.

¹⁴⁵ Letter from Rt Hon Winston Peters, above n 143.

¹⁴⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36.

¹⁴⁷ Letter from Rt Hon Winston Peters, above n 143.

¹⁴⁸ New Zealand Defence Force, above n 111, at 7.4.1.

Conventional Weapons meeting on killer robots from 2014 to 2019.¹⁴⁹ Nevertheless, New Zealand's position holds that the existing law provides an adequate framework in addressing the special challenges posed by AWS both now and in the future.

IV Why the Current Framework has deficiencies when specifically applied to AWS

There are deficiencies with *lex lata* which AWS particularly expose. This raises questions of *lex ferenda* to be discussed in section V. The unique issues in the context of AWS (to be discussed in this section) give context to why reform options are rendered unable to comprehensively solve all challenges. These unique issues will be discussed as follows.

A Article 36 Weapons Review

A key fundamental issue in the context of the development of AWS lies in weapons review. As previously stated, Article 36 *inter alia* obligates states to determine whether a new weapons system would comply with customary principles of IHL.¹⁵⁰ Peter Asaro argues that IHL is fundamentally unsuited to apply to AWS, finding “the very nature of IHL, which designed to govern the conduct of humans and human organizations, presupposes that combatants will be human agents.”¹⁵¹ Autonomous weapons are here to stay and the incentive to further develop these systems towards a sphere of full autonomy has been previously addressed.¹⁵² Therefore, despite the fact that the very existence and prospect of AWS challenges the boundaries of IHL sufficiency, states are likely to continue to acquire, develop, and employ AWS. The only international law mechanism currently in place which stands as an apparent robust safeguard against abundant technological proliferation is art 36.

¹⁴⁹ Stauffer, above n 7.

¹⁵⁰ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36.

¹⁵¹ Asaro, above n 19, at 700.

¹⁵² Noone and Noone, above n 62, at 26.

However, there is not even contemporary international consensus that art 36 creates an international legal obligation on states to undertake review, nor that review is actually even *necessary*.¹⁵³

Article 36 also has inherent deficiencies. Firstly, the overall effect of the Article is that states are left to independently determine whether a new weapon will ultimately be IHL compliant.¹⁵⁴ Because of the Article's general and flexible wording, there is nothing preventing a biased review and states are potentially liable to act in their own self-interest.

Secondly, art 36 does not lay out the requisite means to undertake review. Article 36 only places an obligation on states to undertake review, but it does not determine any temporal application or general accepted form of procedure as to what constitutes a permissible review.¹⁵⁵ Only four states have made their review mechanisms known.¹⁵⁶ Weapons review under art 36 is not internationally synchronised; states are free to independently determine how they will conduct review and the scope of resources they allocate to it.¹⁵⁷ The ICRC suggests reviews should “take place at the stage of the conception/design of the weapon, and thereafter at the stages of its technological development and ... before entering into the production contract.”¹⁵⁸ On this standpoint, review is perceived as something requiring a continuous and meticulous approach. The ICRC assume that the authority undertaking review must also constantly take into account how any AWS is

¹⁵³ Lewis, Blum and Modirzadeh, above n 11, at 62 (fn. 335).

¹⁵⁴ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 17(i); *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 948-949.

¹⁵⁵ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36; *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 131, at 933.

¹⁵⁶ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 949.

¹⁵⁷ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 17(i); *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 948.

¹⁵⁸ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 951.

expected to be used in the future.¹⁵⁹ The ICRC also infer that art 36 requires each State party to establish “a formal procedure”¹⁶⁰, but, with respect, there is nothing in the wording of art 36 which demands as such and very few states actually employ formal review processes in practise.¹⁶¹ The lack of guidance given to states within art 36 affords reviewing authorities almost complete discretion in practise as to what kind of review they deem appropriate.

Linked to this point, state acquisition of AWS is not a strictly legal process; a decision by a State to acquire a new weapon will be made “on the basis of military requirements and commercial prudence.”¹⁶² In this sense, weapons review is not legally synchronised with weapons acquisition. Justin McClelland warns that an absence of legal advice at the acquisition process may lead to a “real danger that ... legal advice will not be considered adequately in key decisions regarding the future acquisition of the equipment.”¹⁶³ This implies that the typical absence of legal advice at the beginning of the weapon’s induction into a state’s arsenal colours the degree of appreciation given to advice regarding the AWS’ lawfulness successive to acquisition.

The general wording of art 36 allows for discrepancies in when testing is actually operationally carried out. Gary Solis finds that “some new weapons are tested only when adopted by a state’s armed forces.”¹⁶⁴ This is particularly problematic in the case of AWS because, as these weapons become more developed, there is the potential for moving further and further away from meaningful human control over them. The ICRC consider that art 82 of API compliments and strengthens art 36 as it “requires that legal advisers be available at all times to advise military commanders on IHL and “on the appropriate

¹⁵⁹ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 952.

¹⁶⁰ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, 949.

¹⁶¹ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36; *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 50.

¹⁶² McClelland, above n 76, at 401.

¹⁶³ McClelland, above n 76, at 402.

¹⁶⁴ Solis, above n 18, at 638.

instructions to be given to armed forces on the subject.”¹⁶⁵ However, if an AWS is already utilised militarily prior to review then this would imply that some form of legal advisory process empowered by art 82 has taken place, when it may actually have not been in practise, ultimately implying a false sense of security. The way in which states are conducting review in practise seems to be at odds with the ICRC’s understanding of art 82 because of the mixed points of entry as to when review occurs versus when weapons are actually being developed and adopted. The wording of art 82 itself also empowers state discretion in choosing when to engage with legal advisers via the wording of advisers being available “when necessary”.¹⁶⁶ No explicit direction is given by API as to when it is in fact “necessary” to seek legal advice. Further, API does not require that legal advisers be neutral.¹⁶⁷ In this sense states may seek legal advice prior to adoption, but this legal advice may be from advisors entrusted by the advice-seeking state and thus could occur in a vacuum. In other words, art 82 does not prevent a process of selective advice-giving as well as hearing. Justin McClelland finds a key factor which goes to the effectiveness of legal review as being “incorporation of legal reviews into the acquisition system process at key decision points”.¹⁶⁸ It has been demonstrated that factor is not necessarily present in the case of testing new AWS, indicating deficiencies in the review framework set up by API.

The largest barrier to the operational sufficiency of art 36 is the presence of national security considerations and/or commercial restrictions on proprietary information.¹⁶⁹ These two factors naturally operate in a way which negates complete formal and actual transparency because they provide justification to states to choose to undertake review in

¹⁶⁵ *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1997*, above n 24, at 933; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 82.

¹⁶⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 82.

¹⁶⁷ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 82.

¹⁶⁸ McClelland, above n 76, at 413.

¹⁶⁹ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 17(i)

a clandestine manner.¹⁷⁰ Further, documentation which is actually made publically available could be distorted because of *inter alia* commercial instincts of focus on positive aspects of the system.¹⁷¹ This is not novel to AWS; these factors necessarily operate in the development of any new kind of weapons technology.

Article 36 is not proposed by anyone in the international community to be a sufficient mechanism on its own in regulating the use and future development of AWS.¹⁷² However, the general and flexible wording of art 36 carries the consequence that the manner in which states may actually practically apply art 36 is largely discretionary. This necessitates a lack of international synchronisation in reviewing new weapons systems which is particularly concerning in the case of AWS due to the fact that the future potential of these systems is largely unknown.

B The Special Nature of AWS

Central to this thesis is the notion that AWS are of a special nature, meaning they differ from traditional weapons systems in several respects. It is important to note that the development of new weapons technology is not a contemporary phenomenon; “there is nothing new about the general desire and the need to discern whether the use of an emerging technological capability would comport with or violate the law.”¹⁷³ However, Harvard PILAC believe that the emergence of AWS “recast[s]” this continuing process of legality assessment of new technologies because such technologies “are seen as presenting an inflection point at which human judgement might be “replaced” by algorithmically-derived “choices”.”¹⁷⁴ Because AWS have a different quality of “potential” development to other more-traditional weapons systems, this creates problems with the applicability and appropriateness of the international law framework in regulating autonomous weapons systems. The unique and novel possibilities in development of autonomy has necessitated two difficult and unresolved legal challenges which were not as prevalent nor complex in

¹⁷⁰ Michael Schmitt and Jeffrey Thurnher ““Out of the Loop”: Autonomous Weapon Systems and the Law of Armed Conflict” (2013) 4 HARV. NAT’L SEC. J. 213 at 234; McClelland, above n 76, at 411.

¹⁷¹ McClelland, above n 76, at 411-412.

¹⁷² Lewis, Blum and Modirzadeh, above n 11, at ftn 319.

¹⁷³ Lewis, Blum and Modirzadeh, above n 11, at iii.

¹⁷⁴ Lewis, Blum and Modirzadeh, above n 11, at iii.

the context of traditional systems.¹⁷⁵ Firstly, there is no clear definition of what constitutes an AWS at law.¹⁷⁶ Secondly, international law provides no clear-cut answer as to whether AWS can be used or not in practise or how far developers are legally permitted to make advancements in the autonomy of these systems in the future.¹⁷⁷

Although not totally unique to AWS, a unique feature is that much of the underlying technology of AWS was not initially designed or developed for the purpose of developing a weapons system.¹⁷⁸ This is particularly the case for AWS as the technological capabilities of weapons systems are rarely limited to use in weapons alone due to AWS' modular construction.¹⁷⁹ Autonomously operating technology has a dual-use character.¹⁸⁰ The foundation of the technology itself was initially developed for use in civilian systems.¹⁸¹ This is seen with autonomous self-driving cars, Boston Dynamics' robot Spot 'dog', and even the iRobot Roomba for example.¹⁸² Autonomous systems have become a "major trend in the civilian sector."¹⁸³ Importantly, autonomous systems are able to be weaponised/utilised during armed conflict with worrying ease – Boston Dynamics have developed their civilian-use Spot 'dog' into a system which operates as an aid to soldiers.¹⁸⁴ There is not much practical difference between a drone which can deliver a parcel to one which can deliver a bomb.¹⁸⁵ Ultimately therefore the technology which underlies much of civilian-use non-weaponised systems is able to be transferred and weaponised in the form of an AWS with greater ease than, say, a nuclear weapon.¹⁸⁶

A further unique problem which is related to the proven societal inflow of non-weaponised technologies which are also echoed in the underlying constructed system of AWS is that

¹⁷⁵ Lewis, above n 122.

¹⁷⁶ *Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*, above n 10, at 5.

¹⁷⁷ Dustin Lewis, above n 122.

¹⁷⁸ Lewis, Blum and Modirzadeh, above n 9, at 16.

¹⁷⁹ Lewis, Blum and Modirzadeh, above n 9, at vii.

¹⁸⁰ Boothby, above n 6, at 162.

¹⁸¹ Heppner and Dillmann, above n 75, at 77.

¹⁸² Heppner and Dillmann, above n 75, at 91.

¹⁸³ Michael C Horowitz "Public opinion and the politics of the killer robots debate" (2016) 3 R&P 1 at 2.

¹⁸⁴ see eg. Boston Dynamics "Legacy Robots" (2020) Boston Dynamics <www.bostondynamics.com/legacy>.

¹⁸⁵ Tegmark, above n 75, at 115.

¹⁸⁶ Lewis, Blum and Modirzadeh, above n 11, at 16.

of proliferation and acquisition. The CCW recently cited the issue of AWS proliferation to undesirable non-state actors such as terrorist organisations.¹⁸⁷ IHL still applies to terrorist groups in armed conflict, however this will be hard to enforce as the prospective use of an AWS by a terrorist organisation is likely to occur in a situation where the state in which the conflict is occurring does not have effective control over the group.¹⁸⁸ IHL is going to be of little practical value in such a situation, particularly as it is questionable whether terrorist organisations will be factoring IHL into decision-making. This problem is less likely to occur with traditional systems as they are often complex and hard to replicate in the absence of advanced scientific and technological tools. Further, whilst civilian technology such as commercial jets have been able to be weaponised by terrorist organizations, the capacity for adverse use of transformed civilian systems is still able to be estimated in a way where AWS are not because of the yet-to-be-understood potential of AWS.¹⁸⁹ The conclusion that AWS technology will be used in the future in less-controlled environments as well as by multiple different actors therefore appears highly feasible.

C Benefits of autonomy

Related to the general unique nature of AWS is the fact that AWS have greater inherent and more clearly identifiable benefits than other weapons systems such as, say, blinding lasers. The international community responded to the latter with consensus in implementing a ban on the development and use of blinding lasers.¹⁹⁰ One of the obvious reasons for this is that blinding lasers operate in a permanent and particularly egregious manner. Therefore, it is not in the incentive of states to have their own combatants harmed by this particular technology i.e. the benefit in the technology is little-to-none.

¹⁸⁷ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 23(a).

¹⁸⁸ *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v United States of America) (Merits)* [1986] ICJ Rep 14 at 115.

¹⁸⁹ Marchant et al. “International Governance of Autonomous Military Robots” (2010) *Columbia SCI. & TECHNOL. LAW REV.* 2 at 13 (fn. 53).

¹⁹⁰ Additional Protocol 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 (Protocol IV, entitled Protocol on Blinding Laser Weapons), above n 5.

However, AWS are different in the sense that they have the potential to “extend and compliment human capability in a number of ways.”¹⁹¹ Amitai Etzioni and Oren Etzioni identify the two most recognised benefits of AWS: (1) military advantage and (2) ethical/humanitarian preferability.¹⁹² Arguably, neither of these two factors are present in weapons technology which has previously received ban on use at international law.

1 Capacity to improve IHL?

A further acknowledged benefit of autonomy is said to be that AWS may have the capacity for improving IHL. In a recent CCW meeting it was noted that AWS may be “useful for enhancing the implementation of IHL ... given the potential for emerging technologies to reduce human error and to increase precision in attacks.”¹⁹³ In much scholarship AWS’s capacity to improve IHL is almost assumed, but arguably this wholly depends on the use with which a particular AWS is given and the functions the system is given by humans. Although there is evidence that AWS may be more precise than humans,¹⁹⁴ there is also evidence that it may be more imprecise.¹⁹⁵ Further, given the military utility in the use of AWS in armed conflict there is also the risk that states may prematurely deploy this technology without rigorous testing and review, which would thus lead to a regression in IHL compliance rather than a furtherance of the development IHL.

D The incentive to create systems which may breach IHL

It is important to emphasise that there is an incentivisation for states to move towards using fully ‘autonomous’ systems which may push the boundaries of IHL compliance. Military utility and value lies in, *inter alia*, speed and efficiency in response. Max Tegmark compellingly states:¹⁹⁶

¹⁹¹ US Department of Defense, above n 14, at 4.

¹⁹² Amitai Etzioni and Oren Etzioni “Pros and Cons of Autonomous Weapons Systems” (2017) May-June MR 72 at 72-74.

¹⁹³ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 22(c).

¹⁹⁴ Heppner and Dillmann, above n 75, at 77.

¹⁹⁵ Noone and Noone, above n 30, at 33.

¹⁹⁶ Tegmark, above n 75, at 111.

“in a dog-fight between a fully autonomous drone that can respond instantly and a drone reacting more sluggishly because it’s remote-controlled by a human halfway around the world, which one do you think would win?”

Scholars emphasise that “military technology is a field driven by change – the constant pursuit to be better, faster stronger.”¹⁹⁷ This factor is not to be diminished in the context of AWS; it appears likely that states will want to develop the fundamental underlying technology to a place of a higher degree of autonomy.¹⁹⁸ Having a human in-the-loop naturally becomes militarily undesirable: “as the complexity and speed of these systems increase, it will be increasingly limiting and problematic for performance levels to have to interject relatively-slow human decision-making.”¹⁹⁹ Solis notes that “a truly autonomous system would have artificial intelligence that would have to be capable of implementing IHL.”²⁰⁰ Though this point cannot move past long range speculation, it is perceivable that in the rush to get ahead, autonomy may be prioritised over legality in development of AWS.

E Problems of operationalisation

International law does not give a clear cut answer as to whether AWS can be lawfully used during armed conflict nor does it give clear cut answers as to how far the underlying technology can be lawfully developed in the future. Further, international law has its own inherent limits; it cannot deal with the unique nature of AWS in a complete way even if the international legal framework itself were to be without deficiencies because it is but one aspect of the law. Further, because there is no contemporary consensus as to the development potential of AWS,²⁰¹ there is difficulties in constructing a bespoke and complete wrap-around legal framework because we have not yet reached a place of understanding as to what exactly we are seeking to regulate and therefore what the operationalized role of the law should be in preventing unanticipated consequences in this area.

¹⁹⁷ Marchant et al., above n 189, at 1.

¹⁹⁸ Ronald Arkin *Governing Lethal Behavior in Autonomous Robots* (Chapman and Hall, 2009) at 7-10; Thurnher, above n 21, at 105.

¹⁹⁹ Marchant et al., above n 189, at 3.

²⁰⁰ Solis, above n 18, at 537.

²⁰¹ see e.g. Dinstein, above n 47, at 19; Lewis, Blum and Modirzadeh, above n 11, at 21; Boothby, above n 6, at 150; Tegmark, above n 75, at 138.

V Options for Reform at International Law which cannot comprehensively solve all issues

Naturally, questions of reform arise as it has been acknowledged that there exists deficiencies in the aforementioned legal framework when it is specifically applied to AWS. This paper will critically assess four general reform options. However, it will be argued that there are comprehensive issues with all reform options, thus advancing the argument that international law cannot solve all issues in the context of AWS. This does not negate taking reform steps in this area altogether; international law must deal with the prospect of the future development of AWS, even if this may not be in a comprehensive way.

The unknown future potential of AWS brings us to an apparent dichotomy of choice proffered by scholars between a complete ban.²⁰² or some form of regulation on the use of AWS via the existing IHL framework or further elucidation of relevant principles.²⁰³ Just this year, the United Nations Secretary-General acknowledged the calls from some Member States for an international treaty banning the use of AWS versus others who believe that the existing state of IHL is “sufficient to regulate their use.”²⁰⁴ This paper opposes the latter stance that IHL is sufficient because the existing framework has various deficiencies when specifically applied to AWS. Because of either problems of practical operationalisation and/or lack of robustness, this paper argues that none of the reform options to be explored are able to be a panacea to the unique issues which AWS bring about.

In the view of the United Nations Secretary-General, all Member States “appear to be in agreement that, at a minimum, retention of human control or judgment about the use of

²⁰² See e.g. Christian, above n 48; Asaro, above n 19, at 688.

²⁰³ Kenneth Anderson and Matthew Waxman “Law and Ethics for Autonomous Weapon Systems: Why a Ban Won’t Work and How the Laws of War Can” (10, April, 2013) SSRN <papers.ssrn.com/sol3/papers.cfm?abstract_id=2250126#references-widget> at 49; Solis, above n 21, at 561; Schmitt, above n 130, at 35.

²⁰⁴ United Nations Security Council, above n 63, at 38.

force is necessary” in the case of AWS.²⁰⁵ Whilst some Member States view the existing legal framework as “sufficient” in ensuring as such, it is argued that the framework, in particular art 36 weapons review, does not in fact go far enough in securing retention of human control. IHL fails to provide adequate safeguards against future adverse use of AWS during armed conflict.

In 2019 the CCW meeting explored various options for reform to compliment IHL, these being:²⁰⁶

- (1) a legally binding instrument;
- (2) a political declaration;
- (3) guidelines, principles or codes of conduct; and
- (4) improving implementation of existing legal requirements, including legal reviews of weapons.

This paper seeks to explore these more-obvious options in greater depth as well as propose other bespoke legal ameliorations.

A Hard law

There is currently no *ad hoc* prohibition at international law on the use of AWS.²⁰⁷ No established treaty exists which specifically applies to autonomous weapons and their special nature.²⁰⁸

The New Zealand Military Manual admits that:²⁰⁹

²⁰⁵ United Nations Security Council, above n 63, at 38; see also António Guterres, quoted in ‘Autonomous Weapons That Kill Must Be Banned, Insists UN Chief’, UN News, 25 March 2019, <<https://news.un.org/en/story/2019/03/1035381>>.

²⁰⁶ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, Annex III at 5.

²⁰⁷ Bashir Ali Abbas “Lethal Autonomous Weapons Systems under Existing Norms of International Humanitarian Law” (2020) 14 *Journal Def. Stud.* 51 at 52.

²⁰⁸ Boothby, above n 6, at 146.

²⁰⁹ New Zealand Defence Force, above n 111, 7.2.4.

“although the general principles upon which weapons are considered to be unlawful are clear, States generally prohibit or restrict the use of a weapon or munition only when it is dealt with specifically in a treaty.”

This implies that if we desire to meaningfully regulate AWS, it must be via hard law. It is important to emphasise that any legally-binding instrument seeking to regulate AWS may either deem AWS unlawful *per se* or, contrastingly, outline unlawful uses of an otherwise lawful AWS generally.²¹⁰

There are various challenges to actually creating a treaty which would adequately mitigate AWS issues. Firstly, there are problems of definition. Bonnie Docherty proposes a prospective treaty banning AWS, arguing the treaty should apply to “any weapon system that selects and engages targets based on sensor processing, rather than human input.”²¹¹ The scope of any contemporary AWS treaty has to be inescapably broad because there is no international consensus on definition as well as the fact that the parameters of AWS future development are yet to be understood.

Secondly, questions arise as to what the requisite elements of AWS would be and what obligations the treaty necessarily must impose on state parties. Bonnie Docherty argues that, firstly, there must be a general obligation on states to “maintain meaningful human control.”²¹² This would appear to *prima facie* prohibit development of any fully AWS. The purpose of this general statement is to prevent non-application of any treaty to a circumstance where it should apply.²¹³ The more ‘detailed’ obligations identified are on systems which:²¹⁴

²¹⁰ Schmitt, above n 160, at 2.

²¹¹ Bonnie Docherty “The Need for and Elements of a New Treaty on Fully Autonomous Weapons” (June 2020) Human Rights Watch < <https://www.hrw.org/news/2020/06/01/need-and-elements-new-treaty-fully-autonomous-weapons>>.

²¹² Docherty, above n 211.

²¹³ Docherty, above n 211.

²¹⁴ Docherty, above n 211.

- (1) always select and engage targets without meaningful human control;
and
- (2) are by their nature problematic (e.g. which kill based on data and/or make discriminatory distinction via algorithm).

The overall problem with adopting any prospective international law treaty in the context of AWS is that it can only operate within a sphere of generality and abstraction simply on the basis that contemporary understanding is limited in relation to the future potential of AWS.²¹⁵ Schmitt argues “until both their potential for unintended human consequences and their combat potential are better understood, it is unlikely that any State would seriously consider banning AWS.”²¹⁶ Bonnie Docherty’s aforementioned treaty elements are clearly limited by this contextual propensity. Even in an article that has the purpose of delineating elements of a prospective treaty, explicit and identifiable obligations are unable to be made out. In this sense, a treaty would not necessarily restrain parties subject to it in the way we may truly desire it to as it is difficult to reach agreement on workable treaty elements.²¹⁷ Thus, unanticipated consequences are not necessarily mitigated through a hard law option.

1 Specific Treaties – weapons development treaties

Alongside problems of adequate written creation, an international ban on AWS via treaty may be distinctly and uniquely challenging on the basis of practical implementation and operationalisation. Historically, the development of new weapons systems have prompted the international community to adopt specific treaties to address the unique issues which particular new weapons bring to the fore.²¹⁸ It is normatively clear that, when a particular weapon is being developed which has the potential to cause abhorrent harm then this will often prompt international consensus that there is a problem which requires legal action beyond just IHL.²¹⁹ The New Zealand Military Manual explicitly accounts for specific

²¹⁵ Anderson and Waxman, above n 203, at 45; Schmitt, above n 130, at 36.

²¹⁶ Schmitt, above n 130, at 36.

²¹⁷ Anderson and Waxman, above n 203, at 45.

²¹⁸ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 76.

²¹⁹ see e.g. *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)*, above n 2, at 76.

international weapons development treaties in Chapter 7.²²⁰ Weapons development treaties are to be discussed to the extent that they indicate why AWS is unique and distinct to other already-prohibited weapons. This demonstrates why the future legal pathway of international prohibition on AWS resists regulation in practice for the contemporary moment.

Biological and Chemical Weapons

A ban on biological warfare and chemical weapons is reflected in both treaty and custom.²²¹ It is argued that the United States unilaterally supported a ban on biological weapons because it was “already top of the chain” and that biological weapons would make this status quo uncertain.²²² Negotiation of the Biological Weapons Convention “proved quick”, largely on the basis of renunciation of biological weapons by the United States.²²³ Further, the Convention on Chemical Weapons received widespread support and “has been ratified by virtually all of the world’s states.”²²⁴

The internationally harmonious aversion to biological and chemical weapons is not present in the case of AWS. Kenneth Anderson finds that limitation on AWS “will have little traction with states whose practice matters most, whether they admit to this or not.”²²⁵ State positions on AWS regulation via treaty reflect this notion. For example the United States and Russia are investing heavily in AWS development and are, unsurprisingly, the same states which profoundly oppose an international ban.²²⁶ Non-supportive states may well hold humanitarian concerns about the use of AWS but they are nevertheless “self-interested entities, [so] these concerns are tempered by their desire to retain the ability to

²²⁰ New Zealand Defence Force, above n 111, at 7.6.

²²¹ Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxin Weapons and on their Destruction UNTS 1015 (opened for signature 10 April 1972, entered into force 26 March 1971); Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction 45 UNTS 197 (opened for signature 3 September 1992, entered into force 29 April 1997), at Preamble; ICRC Customary IHL rules 72-76 < https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul>.

²²² Tegmark, above n 75, at 116; Jozef Goldblat “The Biological Weapons Convention – an Overview” (1997) 318 Int’l Rev. Red Cross 251.

²²³ Solis, above n 18, at 768.

²²⁴ Solis, above n 18, at 770.

²²⁵ Anderson and Waxman, above n 203, at 45.

²²⁶ Stauffer, above n 7.

fight effectively in order to achieve national interests.”²²⁷ Country positions on banning AWS appear to greatly reflect this sentiment, whereas, in the case of biological and chemical weapons, a ban was supported by the states whose positions arguably mattered most.

Blinding Lasers

Of all treaties, the Protocol on Blinding Laser Weapons (Protocol IV) was based on the most sufficient support by the international community.²²⁸ Derived from the CWW framework treaty,²²⁹ Protocol IV prohibits the use and transfer of weapons which cause permanent blindness. There has been universal compliance by contracting parties following ratification.²³⁰

The case of blinding lasers highlights inherent differences between AWS and the kinds of weapons which the international community has vehemently opposed through prohibition. Reasons for this include, but are not limited to, the fact that blinding lasers do not have the depth to improve IHL compliance, whereas tangible arguments exist for the capacity of AWS to improve IHL.²³¹ Moreover, blinding lasers operate in a permanent and inherently egregious manner.²³² AWS, by contrast, can be used in numerous ways and thus could operate in a manner almost indistinguishable from ‘normal’ weapons. Much of the established prohibition treaties are predicated on the fact that the weapons which they seek to regulate are not going to be of benefit to any state. For example, it is patently clear that weapons made for the purpose of causing visceral blindness are going to have little-to-no benefit in armed conflict nor have any beneficial use to civil society. When it comes to

²²⁷ Schmitt, above n 130, at 35.

²²⁸ Additional Protocol to the Convention on Prohibition or Restrictions on the Use of Certain Conventional Weapons which may be deemed to be Excessively Injurious or to have Indiscriminate Effects (Protocol IV, entitled Protocol on Blinding Laser Weapons), above n 5; ICRC Customary IHL rule 86 < https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul>.

²²⁹ 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 (and Protocols), above n 5.

²³⁰ Solis, above n 18, at 744.

²³¹ see e.g. Heppner and Dillmann, above n 75, at 77.

²³² Dr. R. DeVour “Possible Psychological and Societal Effects of Sudden Permanent Blindness of Military Personnel Caused by Battlefield use of Laser Weapons” in Louise Doswald-Beck (ed) *Blinding Weapons: Reports of the Meetings of Experts Convened by the International Committee of the Red Cross on Battlefield Laser Weapons 1989-1991* (Geneva: ICRC, 1993) 46 at 51.

AWS however, the answer is not so clear due to their multiple capacities for beneficial use both in armed conflict and when the underlying technology is utilised in civil spaces.²³³

Convention on Cluster Munitions and Anti-Personnel Mines

The Convention on Cluster Munitions (CCM) and the Anti-Personnel Mines treaty (Protocol II) are treaties which *prima facie* lend themselves most towards the possibility of practical implementation of an AWS treaty.²³⁴ The CCM is considered to be a “natural progression” from Protocol II.²³⁵ Prior to signing, both treaties, like AWS, had opposition from pivotal states.²³⁶ There was not international consensus on these treaties and they have still not been signed by the United States, China or Russia.

Cluster Munitions are, in their most generalist sense, bombs which disperse once dropped, hence the humanitarian concerns that arise regarding their lack of precision and control.²³⁷ Further, some submunitions may not detonate during the conflict itself and therefore lay dormant until civilians come across them.²³⁸ Yet, they are still used during armed conflict.²³⁹ Further, in cases where they have in fact been used by non-contracting parties, contracting parties have interpreted the provisions of CCM so narrowly that the treaty has in the past been deemed to not prohibit actions taken using what appeared to be cluster munitions.²⁴⁰

This is particularly relevant to AWS on the basis that constructivists may argue an AWS treaty absent the great powers could create stigma and social pressure around AWS use which would result in positive future outcomes. However, if we take the case of CCM, it

²³³ Lewis, Blum and Modirzadeh, above n 11, at 70.

²³⁴ United Nations Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction 2056 UNTS 211 (opened for signature 3 December 1987, entered into force 1 March 1991); Convention on Cluster Munitions 2688 UNTS 39 (opened for signature 3 December 2008, entered into force 1 August 2010).

²³⁵ Treasa Dunworth *Humanitarian Disarmament: An Historical Enquiry* (Cambridge University Press, United Kingdom, 2020) at 144.

²³⁶ Solis, above n 18, at 738.

²³⁷ Dunworth, above n 235, at 147.

²³⁸ Dunworth, above n 235, at 150.

²³⁹ “U.S Using Cluster Munitions In Iraq” (1 April 2003) Human Rights Watch <<https://www.hrw.org/news/2003/04/01/us-using-cluster-munitions-iraq>>.

²⁴⁰ see e.g. Thomas Nash “UK fails to condemn use of cluster bombs in Yemen” *Article 36* (online ed, United Kingdom, 3 September 2015).

is not clear that stigmatisation would in fact occur in an AWS context, as state parties may again interpret treaty provisions narrowly to avoid denunciation of non-contracting states when they use AWS. This factor may be distinctly amplified in the case of AWS due to lack of consensus on definition, whereas cluster munitions were already clearly understood and defined in contexts of non-condemnation.

Overall, the examples of specific weapons prohibition treaties already-adopted at international law serve to highlight the particular practical and operationalised challenges which render the prospect of an international AWS treaty highly unlikely. Only around 30 states have explicitly declared they wish to prohibit AWS, and key sweepstate states have simply said that such a move would be “premature”.²⁴¹ Whilst there is scholarship surrounding the potential for expedient creation of hard law despite buy-in from key target states,²⁴² this is again distinctly challengeable in the case of AWS because of the fact that the technology itself is far from a place of being fully developed as well as the potential for beneficial use of AWS. Kenneth Anderson finds “the historical reality is that if a new weapon system greatly advantages a side, the tendency is for it gradually to be adopted by others perceiving they can benefit from it, too.”²⁴³ In other words, the ‘have nots’ may simply be viewed as trying to curtail the ‘haves’ through a hard law option. For the contemporary moment, the problem of AWS appears to resist hard law regulation.

B Customary law

There is no current customary law which explicitly prohibits AWS development or use – customary IHL applies to the use of AWS just as it would any other weapons system.²⁴⁴ This paper has argued that this general legal framework has deficiencies when applied to AWS. In order for specific customary law to develop, buy-in by powerful and implicated states is usually required for the creation of a meaningful culture of limitation. Again, the contemporary state attitudes on AWS use and development are far from a place of cultural

²⁴¹ Stauffer, above n 7.

²⁴² see e.g. Adam Bower *Norms without the Great Powers: International Law and Changing Social Standards in World Politics* (Oxford University Press, Oxford, 2017).

²⁴³ Anderson and Waxman, above n 203, at 40.

²⁴⁴ Solis, above n 18, at 539.

synchronisation.²⁴⁵ The same argument applies in terms of any AWS treaty absent key states' lack of ability to generate compliance and internationalisation of norms.

C Soft law

Some scholars suggest the most realistic way to quash issues of written manifestation of an AWS treaty or practical/operational issues of implementation of treaty/custom is to craft soft law guidelines surrounding the use and development of AWS.²⁴⁶ These guidelines would necessarily be non-binding.

The aforementioned GGE guiding principles represent soft law regulation of AWS.²⁴⁷ However, there are debates as to whether they actually add anything to the existing IHL framework.²⁴⁸ Bashir Ali Abbas argues that the prospect of fully AWS invites “a coherent restatement of existing norms.”²⁴⁹ Essentially this takes the position that IHL need only be clarified as to how it applies to AWS but that no new *corpus juris* is required. This would mean that, even if the GGE principles only clarify IHL, this would be sufficient. The obvious alternative to the position of soft law clarification is to build upon the existing 11 principles by introducing new explicit necessary elements. Analogous action has occurred in other policy areas at international law, for example in the area of cyber warfare via formulation of the Tallinn Manual.²⁵⁰

The benefits of a soft law option lie in flexibility and holism; it allows for contextual and circumstantial variance, as well as potentially moving away from the historical preoccupation with problems of definition. This also allows the technology to develop organically and therefore not inhibit beneficial evolutionary aspects. However, herein also lies the issue that “policy statements will necessarily be more general and less factually

²⁴⁵ Stauffer, above n 7.

²⁴⁶ see e.g. Anderson and Waxman, above n 203, 46.

²⁴⁷ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at Annex IV.

²⁴⁸ see e.g. Lewis, above n 152; Moyes, above n 122, at 1-4.

²⁴⁹ Ali Abbas, above n 207, at 55.

²⁵⁰ Michael Schmitt *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* (2nd ed, Cambridge University Press, Cambridge, 2017).

specific than critics would like” because understanding of AWS is still in its infancy.²⁵¹ This factor leads Michael Schmitt to conclude that, “in the absence of even a single such system being fielded, it is premature to draw conclusions either as to ... whether [AWS] should be banned as a matter of policy.”²⁵² As a result, any improvement on the 11 principles can only occur incrementally in line with progression in technological proficiency.²⁵³ Effective soft law should be accompanied by guidelines to states outlining their respective obligations. Further, long-term sustained effort by the community of states is required in order for soft law to create worthwhile transformation.²⁵⁴ A related issue is that information sharing is fundamental. States are unlikely to share the details of their technological developments with one another as this would be counter-intuitive from a self-interest perspective.²⁵⁵ Kenneth Anderson thus ultimately characterises the difficulties in contemporary AWS policy creation as being “enormous”.²⁵⁶

D Independent monitoring and/or Internationally synchronising Weapons Review

A bespoke reform option that has not been extensively explored in scholarship would be to create an international body to specifically carry out review of new AWS.²⁵⁷ For the purpose of this paper, this option is characterised as ‘independent monitoring’. An obvious barrier of operationalisation of art 36 lies in the notion that it asks states themselves to review the autonomous weapons systems which they themselves seek to advance. The incentive for states to expand acquisition and augmentation of AWS and to progress AWS to a point of greater sophistication and reduced meaningful human control merits emphasis.²⁵⁸ Because of this, states may be liable to biased and/or exiguous review. It appears illogical that the subject who is motivated to push the boundaries of lawfulness via technological evolution is the very same subject required by art 36 to undertake review.

²⁵¹ Anderson and Waxman, above n 203, at 48.

²⁵² Schmitt, above n 130, at 37.

²⁵³ Anderson and Waxman, above n 203, at 46.

²⁵⁴ Anderson and Waxman, above n 223, at 46.

²⁵⁵ Schmitt, above n 130, at 35.

²⁵⁶ Anderson and Waxman, above n 203, at 47.

²⁵⁷ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5.

²⁵⁸ Marchant et al., above n 189, at 1.

Independent monitoring naturally evades these concerns of self-interest. International organisations made up of independent experts who conduct review on state activity already exist in other policy spheres, as seen in the cases of the Human Rights Committee or the country monitoring reports established by the OECD Anti-Bribery Convention.²⁵⁹ Further, the United Nations Security Council is given general monitoring competencies which could serve as justification for the establishment of an organisation with AWS specificity.²⁶⁰

However, the case of AWS presents significant barriers to the creation of this reform option as it brings about durable concerns of national security and intellectual property justifications for lack of transparency.²⁶¹ Information sharing would be required in order for either proposed reform option under this section to meaningfully function. In the case of AWS, information sharing appears highly unlikely due to lack of commercial and military incentives. The fact that key states resist transparency about their own review processes implies the prospect of some form of international synchronisation of review is unlikely to materialise. The even further step of sharing information on internal programming to an independent national organisation for the purpose of independent review appears even more untenable on this basis.²⁶² Kenneth Anderson finds that unless key states accept the risks of transparency in order to begin a process of consensus then “they may lose the opportunity to do so later.”²⁶³

Overall, there are inherent difficulties with all proposed reform options due to the special nature of AWS. Problems of practical operationalisation and/or lack of robustness means that none of the reform options are able to comprehensively regulate AWS both now and in the future. This does not negate taking reform steps in this area altogether; international

²⁵⁹ see e.g. International Covenant on Civil and Political Rights 999 UNTS 171 (opened for signature 16 December 1996, entered into force 23 March 1976), art 28; OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions S Treaty Doc No 105-43 (opened for signature 21 November 1997, entered into force 17 December 1997), art 12.

²⁶⁰ Lewis, Blum and Modirzadeh, above n 11, at 91.

²⁶¹ *Report of the 2019 session of the Group of Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, above n 3, at 17(i).

²⁶² Anderson and Waxman, above n 203, at 48.

²⁶³ Anderson and Waxman, above n 203, at 49.

law must deal with the prospect of the future development of AWS, even if this may not be in a comprehensive way.

VI What kind of Future do we want to have?

It has been demonstrated that the international legal framework is deficient in several respects, particularly in the case of art 36.²⁶⁴ Further, although reform options may go towards solving the new and specific challenges raised by the introduction of AWS, these options cannot fully resolve these challenges. Even for responsible states who are committed to the laws of humanity, the contemporary legal regime contemplates the proliferation of lethal AWS on a wide scale.²⁶⁵ Although experts have poured over this legal dilemma, an appropriate solution is yet to be reached. It is difficult to see how international law can be proactive rather than reactive in this type of situation. Yet, a cautious approach is needed when it comes to the future development of AWS so that unintended consequences can be avoided, which means that a proactive approach is absolutely necessary.

Due to lack of comprehensive regulation at international law, the prospect for future development of AWS is confronting. With a lack of contemporary understanding about the true evolutionary potential of autonomous technology, a discussion of the future cannot move past legal conjecture.²⁶⁶ Yet, it is imperative that we consider the kind of future we want; the prospect of fully AWS truly challenges all aspects of society, even challenging what it means for us to be human. The call to look beyond the present is timely.²⁶⁷ Yoram Dinstein discusses AWS and the future:²⁶⁸

the “next generation” weaponry, we are told by armaments’ specialists, will feature robots with AI who will be capable of improvising in the battlefield – making their

²⁶⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), above n 5, art 36.

²⁶⁵ Lewis, Blum and Modirzadeh, above n 11, iii.

²⁶⁶ see e.g. Dinstein, above n 45, at 19-20; Lewis, Blum and Modirzadeh, above n 11, at 21; Boothby, above n 6, at 150; Tegmark, above n 75, at 138.

²⁶⁷ Lewis, Blum and Modirzadeh, above n 11, ii.

²⁶⁸ Dinstein, above n 47, at 19.

own judgment calls in the face of unforeseen events – while free in every respect from humanitarian intervention.

It merits emphasis that underlying technology carrying potential for utilisation in AWS has already surpassed human-level performance in other contexts. This is seen for example in the 2016 “AlphaGo” match whereby a computer program using deep learning repeatedly defeated human expert Lee Sedol.²⁶⁹ AWS however will not be operating for the purposes of pure entertainment; the stakes are undeniably high because AWS may cross the moral Rubicon in armed conflict with destructive results. Max Tegmark explores the possibilities of a “Life 3.0” where machines may learn to outperform humans at everything: the machine “realises that it’s controlled and confined by intellectually inferior humans whose goals it understands but doesn’t share. How does it act on this insight? Does it attempt to break free?”²⁷⁰ Tegmark believes the fundamental safeguard against unanticipated consequences in technological development is to ensure that all machines, including AWS, absorb and preserve human goals.²⁷¹ Such discussions at this stage are of course speculative, but whether we wish to live in a technological utopia or risk omnicide bears consideration. This need not be fatalistic. Our future is not predetermined – we are currently creating it.

²⁶⁹ Lewis, Blum and Modirzadeh, above n 11, ii.

²⁷⁰ Tegmark, above n 75, at 138.

²⁷¹ Tegmark, above n 75, at 329.

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