A Legal Framework for Regulating Autonomous Weapon System Deployments.

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ABBREVIATIONS/ ACRONYMS.

Additional Protocol	AP
Air to Ground Missile	AGM
Airborne Early Warning and Control System	AEW&C
Airborne Warning and Control System	AWACS
Anti-Ship Missile	ASM
Artificial General Intelligence	AGI
Artificial Intelligence	AI
Artificial Super Intelligence	ASI
Autonomous Weapons Systems	AWS
Ballistic Missile	BM
Center for New American Studies	CNAS
Central Intelligence Agency	CIA
Chemical Weapons Convention	CWC
Close In Weapons System	CIWS
Collaborative Operations in Denied Environment	CODE
Command and Control Centre	CCC
Command Launch Equipment	CLE
Command Operating System(s)	COS
Continuous Combat Function	CCF
Convention on Certain Conventional Weapons	CCW
Counter Communications System	CCS
Counter Rockets Artillery and Mortar	C-RAM
Customary International Law	CIL
Defense Advanced Research Projects Agency	DARPA
Demilitarized Zone	DMZ
Department of Defense	DoD
Department of Defense Directive	DoDD
Direct Participation in Hostilities	DPH
Electro-Magnetic Pulse Weapon	EMP
Embodied Artificial Intelligence	EAI
European Convention on Human Rights	ECHR

Executive Operating System(s)	EOS
Exoatmospheric Kill Vehicle	EKV
Future of Life Institute	FLI
Geneva Convention	GC
GMD Communications Network	GCN
GMD Fire Control	GFC
Ground-Based Midcourse Defense	GMD
Group of Governmental Experts	GGE
Human Rights Committee	HRC
Human Rights Watch	HRW
Humanitarian Intervention	HI
Identification Friend or Foe	IFF
In-Flight Interceptor Communications System	IFICS
Integrated Air Defence System	InADS
Inter-Continental Ballistic Missile	ICBM
International Armed Conflict	IAC
International Committee of the Red Cross	ICRC
International Committee on Robot Arms Control	ICRAC
International Court of Justice	ICJ
International Covenant on Civil and Political Rights	ICCPR
International Covenant on Economic, Social and Cultural Rights	ICESCR
International Criminal Court	ICC
International Criminal Tribunal	ICT
International Criminal Tribunal for the Former Yugoslavia	ICTY
International Criminal Tribunal for Rwanda	ICTR
International Human Rights Law	IHRL
International Humanitarian Law	IHL
Joint Air Power Competence Centre	JAPCC
Just War Theory	JWT
Launch Support Systems	LSS
Law of Armed Conflict	LOAC
Law of International Armed Conflict	LOIAC

Lethal Autonomous Weapons Systems	LAWS
Level 1 (Autonomy)	L1
Level 2 (Autonomy)	L2
Level 3 (Autonomy)	L3
Level 4 (Autonomy)	L4
Long Range Anti-Ship Missile	LRASM
Massive Ordnance Air-Blast	MOAB
Meaningful Human Control	MHC
Ministry of Defence	MoD
Missile Defense Shield	MDS
Modern War Institute	MWI
National Council for Peace and Order	NCPO
National Missile Defense (System)	NMD
Non-Governmental Organization	NGO
Non-International Armed Conflict	NIAC
Non-State Armed Group	NSAG
North Atlantic Treaty Alliance	NATO
Observe, Orient, Decide, Act.	OODA
Principle of Unnecessary Risk	PUR
Prisoner of War	PoW
Responsibility to Protect	R2P
Revolution in Military Affairs	RMA
Royal Air Force	RAF
Tactics, Techniques and Procedures	TTP
The Manual Service of Law	MSL
United Nations	UN
United Nations Security Council	UNSC
United States Space Force	USSF
United States Strategic Command	USSTRATCOM
Universal Declaration of Human Rights	UDHR
Unmanned Aerial Vehicle	UAV
Vienna Convention on the Law of Treaties	VCLT

ABSTRACT

A Legal Framework for Regulating Autonomous Weapons System Deployments.

Michael James Pollard.

The principle aim of this research is the creation of a unique legal framework to regulate the use of the emerging technology referred to as Autonomous Weapons Systems (AWS). To date, the formulation of such a framework has not been possible due primarily to the abject lack of certainty as to what an AWS is. Despite this, AWS are particularly controversial primarily because in order for them to operate humankind must delegate battlefield life-or-death decision-making responsibilities to machines. In 2019, amidst increasing calls for *absolute* prohibition to be placed upon their use, a group of governmental experts (GGE), assembled by the United Nations (UN), did endorse a set of (non-binding) "guiding principles". These were intended to help shape future weapons development. However, they are woefully superficial, and notably muted as to exactly what types of weapons they should be applied to.

This thesis seeks to compensate for the existing lacunae in several novel ways. First, it develops an unparalleled, multi-dimensional, definitional tool. This is referred to throughout as the *Template*. Unconventionally, the *Template* allows for individual classification based first, according to a weapons type, second to the matter of whether the AWS is to be deployed defensively or offensively, and third in regard of whether an AWS is to apply a lethal, or non-lethal force (noting the latter two axes represent a particularly contentious element of the existing discussion). It is only by consulting the *Template* that the researcher is able undertake the second thesis aim, which is the realisation of an unrivalled, comprehensive, and independent analysis as to the lawfulness of AWS deployments – doing so according to the *jus ad bellum*, the *jus in bello*, and international human rights law.

From these separate, though inextricably intertwined examinations, various rules are distilled. These are significantly dissimilar to any such rules which have preceded them, not least because each is grounded, or in some other way related to, an existing legal obligation. In closing, the researcher presents these rules holistically as

set guiding principles which efficaciously provide the absent legal framework for regulating individual AWS deployments. Ultimately, this body of research unequivocally supports the researcher's hypothesis that AWS are not inherently unlawful. However, by endorsing the guiding principles, states can greatly restrict or eliminate many of the inherent dangers of utilizing this revolution in military affairs, while still harnessing many of their advantages.

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Charter of the United Nations (1945) 892 UNTS XVI 119.

Statute of the International Court of Justice (1945) 15 UNCIO 335.

Convention on the Prevention and Punishment of the Crime of Genocide (1948) 78 UNTS 277.

Universal Declaration of Human Rights (1948) 217 A (III).

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INTRODUCTION

I. Aims and Purpose of Research.

A Group of Governmental Experts (GGE) convened by the United Nations (UN) in 2016,[1] operating under the auspices of the Convention on Certain Conventional Weapons (CCW),[2] provided the following definition; An Autonomous Weapons Systems (AWS) is,

> '[a]ny weapon system with autonomy in its critical functions. That is, a weapon system that can select (i.e., search for or detect, identify, track, select) and attack (i.e., use force against, neutralize, damage or destroy) targets without human intervention.'[3]

While this definition can naturally apply to *intangible*, "cyber" weapons systems, the term AWS is more *generally* used to refer to Embodied Artificial Intelligence (EAI)—that is, a cyber system coupled with advanced robotics.[4] There is some disparity within the current literature as to whether AWS already exist.[5] The prevailing view within the legal scholarship suggests, however, that in the "truest" sense of the definition, AWS

[1] Noting that prior to 2016, the GGE had met annually, though informally, on three previous occasions. For a useful timeline see,<https://dig.watch/process/gge-laws> accessed 20 April 2021.

[2] United Nations, 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) (As Amended on 21 December 2001), 10 October 1980, 1342 UNTS 137 (hereinafter referred to as the CCW), available at, <https://www.icrc.org/en/doc/assets/files/other/icrc_002_0811.pdf> accessed 9 June 2021.

[3] This definition was provided by the International Committee of the Red Cross (hereinafter ICRC). See, Views of the International Committee of the Red Cross (ICRC) on autonomous weapon system, 11 April 2016, Convention on Certain Conventional Weapons (CCW) Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS) 11-15 April 2016, Geneva. Available at <https://www.icrc.org/en/document/views-icrc-autonomous-weapon-system> accessed 26 April 2021.

[4] For a more in-depth discussion regarding EAI, see generally the current authors additional works, Francis Grimal & Michael J. Pollard, '"Embodied AI" and the Direct Participation in Hostilities: A Legal Analysis' (2020) 51 GEO. J. INT'l L. 513, Francis Grimal & Michael Pollard, 'The Duty to Take Precautions in Hostilities, and the Disobeying of Orders: Should Robots Refuse?' (2021) 44 Fordham Int'l L.J. 671, and Francis Grimal & Michael Pollard, Embodied Artificial Intelligence and *jus ad bellum* Necessity: Influence and Imminence in the Digital Age. (Forthcoming: on file with author).

[5] See e.g., Rebecca Crootof, 'The Killer Robots are Here: Legal and Policy Implications' (2015) 36 CARDOZO LAW REVIEW, 1837, 1863 where the author notes: 'There is a nearly universal consensus, among both ban advocates and skeptics, that autonomous weapon systems do not yet exist'. Noting that the author goes on to state at pp1844 that 'contrary to the nearly universal consensus, autonomous weapon systems currently exist and have already been integrated into states' armed forces'. As the following body of research will demonstrate (and in particular Chapter One) the current author fully supports Crootof's, albeit minority, stance in this regard.

are in gestation. For AWS to function they must, to some degree, utilise Artificial Intelligence (AI).[6] They are a highly controversial emerging technology because, as reflected in the definition above, they will be delegated greater decision-making responsibilities regarding matters of life-or-death. For some, the thought of machines making life or death battlefield are the ultimate taboo—they must never be deployed, and must be manifestly prohibited by way of a new international treaty.[7]

An alternative view, albeit one that receives relatively little support, is the controversial assertion that AWS already exist.[8] This is the present author's firm hypothesis. And, despite concerns, AI cannot be shown to be an inherently disruptive innovation. Instead, its development and introduction is continuing at pace, not least, because it relieves humankind from having to undertake unfavourable tasks – especially those considered dull, dirty and/ or dangerous (the three D's).[9] All three of these are inherent in the majority of military operations. But the third, the removal of humankind from dangerous situations, perhaps offers states the greatest motivation to develop their AWS further.[10] And, strategic considerations (such as the current conduct of weapons manufacturers and their primary customers i.e., states), provide considerable support to the present author's unwavering belief that increasingly advanced AWS are inevitable.[11]

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[6] Noting that while many believe weapons that are merely "automatic" or "automated" are not AWS, it is often only a matter of semantics. The point is, as is expanded upon further in Chapter One, to be an AWS, a machine, or in some instances, a code, must be capable of operating, independently of human supervision.

[7] See e.g., Future of Life Institute, 'An Open Letter to the United Nations Convention on Certain Conventional Weapons' (21 July 2017), available at, <https://futureoflife.org/autonomous-weapons-open-letter-2017/> (accessed 6 July 2021). (Future of Life Institute hereinafter referred to as FLI).

[8] See, n. 5.

[9] See e.g., Crootof n.5, 1867. For a useful introductory discussion regarding the three D's see also, Robotics Online Marketing Team 'How Robots Are Taking on the Dirty, Dangerous, and Dull Jobs' (*Association for Advancing Autonomy*, 15 October 2019) < https://www.automate.org/blogs/how-robots-are-taking-on-the-dirty-dangerous-and-dull-jobs> accessed 6 July 2021.

[10] This is to be expanded upon in the following chapters. However, while the present author believes AWS exist, they are often fixed position defensive weapons. nonetheless, research and development programmes, such as Boeings Loyal Wingman initiative, are leading armed-forces much closer to the achievement of advanced fully mobile AWS, that can potentially operate anywhere. See e.g., Boeing Airpower Teaming System, < https://www.boeing.com/defense/airpower-teaming-system/> accessed 6 July 2021.

[11] *Ibid.* Noting that under the heading 'Global System' Boeing identifies it is developing the loyal wingman in partnership with the Australian Air Force. The U.S. (Defense Advanced Research Projects Agency (hereinafter DARPA)) is also participating in a similar programme of its own. See, Tate Nurkin, 'The importance of advancing loyal wingman technology' (*Defense News* 21 December 2020) < https://www.defensenews.com/opinion/commentary/2020/12/21/the-importance-of-advancing-loyal-wingman-technology/> accessed 6 July 2021.

The overarching purpose of this thesis is the creation of a unique legal framework for regulating the use of AWS. Only this can ensure that the benefits of AWS can be nurtured while their associated dangers restricted. To support the formation of this (referred to throughout as the *Template*), several supporting aims and purposes are identified, and achieved. In doing this, the researcher overcomes numerous lacunae within the existing scholarly debate. The first of these supplementary objectives addresses the pressing need to adequately define AWS.[12]

As yet, this has been unsuccessful, including, in the present author's mind, the ICRC's attempt cited above. And the lack of an established, widely supported definition has led to a situation where contributing parties have become somewhat distracted in their attempts to develop a consummate 'general' definition. General definitions *are* important. For example, they can help to identify whether a particular observer acknowledges the existence of AWS (or not). However, the primary difficulty in relying upon a definition which merely draws a line in the sand, is that every weapons system is simply classified as either being as autonomous, or non-autonomous.

Under such a definition, therefore, an AWS could be a *smart-grenade*—designed to be thrown by a combatant. This may be programmed, for example, not to detonate upon detecting the presence of civilians.[13] According to exactly the same definition, however, an AWS could *also* be a 'hunter-killer" drone that was programmed to operate extraterritorially, outside of an existing battlefield, and which was programmed to target individuals according to any number of pre-determined (and not necessarily lawful) criteria – e.g., kill all military aged, able bodied, males (including those of a certain ethnicity).

The primary problem is, general, all-encompassing, definitions universally fail to distinguish between AWS that will have positive humanitarian implications when deployed, and those which could be used, for example, as a tool to commit genocide,

[12] For a useful discussion regarding the pressing need to find a suitable definition of AWS, see generally e.g., Michael C. Horowitz 'Why Words Matter: The Real-World Consequences of Defining Autonomous Weapons Systems' (2016) 30 Temp Int'l & Comp LJ 85.

[13] Note that international humanitarian law (IHL) does not altogether prohibit the killing of civilians in armed-conflict. Only that civilians must not be directly targeted. This is expanded upon further in Chapter Three, with regard to the IHL principles of Distinction and Proportionality.

or crimes against humanity.[14] An additional problem to the lack of a means of distinguishing one system from another, relates to *usage*. This is because there may be circumstances in which the deployment of a hunter-killer drone could be lawful, and even humanitarianly beneficial, when it is considered alongside an alternative weapon. As a result, while general definitions do have a cursory benefit, they cannot be used to support a comprehensive legal analysis of the lawfulness of individual AWS - such as that presented herein.

A thorough analysis is, clearly, a vital precursor to the construction of a legal framework to regulate AWS. Therefore, that enterprise is the second supporting aim of the present thesis. Central to that analysis, is the creation of the *Template*. This is the thesis' unique definitional, or perhaps more correctly, classificational, apparatus. Constructing the *Template* is the goal of Chapter One. Thus, to avoid repetition, only its fundamental contours are considered here.

At its heart, the *Template* has a multi-axis configuration, which allows for each analysis of AWS to be conducted according to various, but consistent, criteria. First, the *Template* includes a method for classifying AWS according to four types. These are munition, weapons platforms, operational systems, and strategic systems. A second axis further allows for classification according to use – be that either in offence or in defence. Finally, the third axis allows for a distinction to be made regarding the matter of whether an AWS is designed to apply a lethal, or non-lethal force.

As identified in Chapter One, the second and third methods of classification are vital, because there is a distinct lack of clarity as to whether the debate should be limited to lethal, offensive AWS. However, because the *Template* allows for a uniquely holistic

[14] Noting that genocide is prohibited by international a law, see generally, Convention on the Prevention and Punishment of the Crime of Genocide (1948) 78 UNTS 277 (hereinafter Genocide Convention). As is the commission of crimes against humanity, which Article 7 Rome Statute of the International Criminal Court (1998) 2187 UNTS 3 (hereinafter Rome Statute) identifies includes, "any of the following acts when committed as part of a widespread or systematic attack directed against any civilian population, with knowledge of the attack: (a) Murder, (b) Extermination, (c) Enslavement, (d) Deportation or forcible transfer of population, (e) Imprisonment or other severe deprivation of physical liberty in violation of fundamental rules of international law, (f) Torture, (g) Rape, sexual slavery, enforced prostitution, forced pregnancy, enforced sterilization, or any other form of sexual violence of comparable gravity, (h) Persecution against any identifiable group or collectivity on political, racial, national, ethnic, cultural, religious, gender as defined in paragraph 3, or other grounds that are universally recognised as impermissible under international law, in connection with any act referred to in this paragraph or any crime within the jurisdiction of the Court, (i) Enforced disappearance of persons, (j) The crime of apartheid, (k) Other inhumane acts of a similar character intentionally causing great suffering, or serious injury to body or to mental or physical health."

analysis, it removes the need to limit the discourse to a particular type, or deployment, as the existing literature does. This thesis therefore has a tripartite of aims, which are presented below in a more formal manner. But, while the achievement of every aim is a significant and unique undertaking (and indeed a valuable contribution to the literature in this area), each step is an instrumental necessary facilitator of the next. These three aims are more formally presented as follows:

I.II Aim One: Define Autonomous Weapons Systems.

Identify the most suitable method for defining AWS. This Definition (the Template) must take account of the need to distinguish individual AWS, and the circumstances regarding each deployment.

I.III Aim Two: Assess the lawfulness of Autonomous Weapons Systems.

Identify the law that is applicable to AWS deployments. And, with reference to the Template (aim I), critically consider whether (i) when viewed holistically, AWS can be identified as inherently unlawful, (ii) any individual AWS can be identified as inherently unlawful, and (iii) as opposed to the actual weapons systems, there are any circumstances (i.e., specific deployments) which can be identified as unlawful. Where each of these three analyses identifies a standard, record it in the form of a "RULE".

I.IV Aim Three: Construct A legal framework for Regulating the Use of Autonomous Weapons Systems in Armed Conflict.

Utilise the results of the Step Two investigation and in particular, the pre-identified rules, to construct a user friendly, future-proof, method for regulating AWS deployments. This framework must ensure that any humanitarian benefits of AWS are nurtured - while inherent dangers are minimized, if not altogether eliminated.

II Context: Why is This Research Needed?

Having presented the aims and purpose the of the thesis, Part II identifies why this research is necessary. The following discussion begins with a brief examination of the use of *robots* in contemporary armed conflicts. This is necessary because it provides both a historical perspective to AWS and distinguishes AWS from non-autonomous

robotic weapons systems (which are not a subject to the present analysis). Part II continues by examining the reasons why AWS are controversial and highlights the lacunae within the existing literature. This final examination provides the motivation, while underlining the urgent need for the comprehensive research that is contained with the present thesis.

With the ICRC's definition in mind, the reader will readily appreciate why AWS are colloquially referred to as "Killer Robots".[15] Such apparatus have consistently been a favorite subject of science fiction writers through the decades.[16] Thus, it is difficult to pinpoint an exact date upon which they began to attract scholarly attention. A useful starting point, however, is 7 October 2001. This date is significant because it represents the day upon which a new weapon of war emerged.

The weapon took the form of a MQ-1 unmanned aerial vehicle (UAV), a so-called Predator drone. The Predator in question was flying over Kandahar, Afghanistan. But it was piloted by a U.S. Air-Force operator (supervised by a Central Intelligence Agency (CIA) analyst), located several thousand miles away, in Virginia U.S.[17] Before 7 October, the use of Predator drones were equipped with high-definition cameras, and generally conducted surveillance and reconnaissance missions in support of *manned* operations.[18] On that night, however, the operator of the Predator, which was armed with Hellfire missiles, remotely engaged and destroyed a target.[19] With that strike, the contemporary age of robotic warfare began.[20]

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[15] See e.g., Robert Sparrow, 'Killer Robots' (2007) Journal of Applied Philosophy, 24 1, 62, and, Bonnie Docherty, 'Loosing Humanity: The Case Against Killer Robots' (*Human Rights Watch in association with the International Human Rights Clinic at Harvard* 2012) (hereinafter HRW 2012). Report available at https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots accessed 23 March 2020.

[16] See generally e.g., Karel Čapek, *R.U.R. (Rossum's Universal Robots),* (Paul Selver and Nigel Playfair (tr) digireads.com 2014), and Isaac Asimov *I, Robot* (1950). (Note that the version cited hereinafter is Isaac Asimov *I, Robot* (paperback edn, HarperVoyager 2018).

[17] For an retrospective discussion regarding the circumstances surrounding this drone strike and its effects, see, Chris Woods, 'The Story of America's Very First Drone Strike: The CIA's then-secret weapon missed Taliban leader Mullah Omar, starting a bureaucratic fight that has lasted 14 years' (*The Atlantic*, 30 May, 2015) <https://www.theatlantic.com/international/archive/2015/05/america-first-drone-strike-afghanistan/394463/> accessed 30 January 2019.

[18] For a useful discussion regarding the history of the predator drone for example, see, Daniel Terdiman, 'The history of the Predator, the drone that changed the world (Q&A)' (*CNET* 20 September 2014) < https://www.cnet.com/news/the-history-of-the-predator-the-drone-that-changed-the-world-q-a/> accessed 6 July 2021.

[19] Woods, *ibid,* n.17.

[20] For a useful and insightful background discussion see, Paul Scharre, *Army of None: Autonomous Weapons and the Future of War* (Norton, 2018), 13-14.

Armed 'drones' quickly became the United States' number one choice of weapon in the war on terror. [21] Indeed, in many instances, they are still the preferred method of conducting targeted strikes.[22] With the U.S. setting the benchmark, a number of other states have also followed suit, doing so either by acquiring new armed drones of their own, or by arming existing surveillance UAVs.[23] According to one source, today, 19 states are currently in possession of armed UAVs,[24] and the number of Non-State Armed Groups in possession of them is also growing.[25]

Vital to the present thesis, is the fact that unmanned technology is continuing to evolve. The U.S. has, for example, recently carried out successful tests of an air-based launch and recovery system which, will offer significant improvements in operational capability, and greater gains in force-protection once fully developed.[26] In addition, the U.S. has also recently become the first state to refuel a fighter jet from an airborne

[21] Speaking September 20, 2001, nine days after the terror attacks, President George W. Bush noted for example that "Our war on terror begins with al Qaeda, but it does not end there. It will not end until every terrorist group of global reach has been found, stopped and defeated." The full transcript is available at, <https://georgewbush-whitehouse.archives.gov/news/releases/2001/09/20010920-8.html> accessed 30 January 2020.

[22] Note for example that the in 2019, the U.S. conducted 63 'drone strikes' in Somalia alone. See, Statista, 'Number of U.S. drone strikes in Somalia from 2011 to April 2020' (April 2020) < https://www.statista.com/statistics/428549/us-drone-strikes-in-somalia/> accessed 6 July 2021. Also see e.g., United States Africa Command (AFRICOM), 'Somali, U.S. forces engage insurgents in support of the Federal Government of Somalia' (22 July 2020) < https://www.africom.mil/pressrelease/33033/somali-us-forces-engage-insurgents-in-support> accessed 6 July 2021, and, AFRICOM, 'Federal Government of Somalia, AFRICOM target al-Shabaab' (29 July 2020) < https://www.africom.mil/pressrelease/33047/federal-government-of-somalia-africom-target> accessed 6 July 2021.

[23] Israel is understood to have had a UAV capability since 2004, while the U.K. for example, first deployed 'reaper' drones in Afghanistan in 2007. See, Chris Cole, Rise of the Reapers: A brief history of drones' (*Drones Wars UK*, 6 October 2014) < https://dronewars.net/2014/10/06/rise-of-the-reapers-a-brief-history-of-drones/> accessed 6 July 2021.

[24] As of 6 July 2021, Drone Wars UK identify that the U.S., Israel, China, U.K., Iran, Turkey, Pakistan, Iraq, Saudi Arabia, United Arab Emirates, Egypt, Nigeria, Algeria, Ukraine, Qatar, France, Indonesia, Serbia, and Azerbaijan all operates armed drones. They also not that a further 16 states, namely, Italy, Russia, Netherlands, Australia, Belgium, Taiwan, India, Germany, Kazakhstan, Myanmar, South Korea, Turkmenistan, Jordan, Uzbekistan, Tunisia, and Morocco are all close to having a drone capability. See Drone Wars UK, 'Who has Armed Drones?' < https://dronewars.net/who-has-armed-drones/> accessed 6 July 2021.

[25] See e.g., Kerry Chávez and Ori Swed, 'The proliferation of drones to violent nonstate actors' (2021) Defence Studies 21:1, 1, and, Alyssa Sims, 'The Rising Drone Threat from Terrorists' (2018) 19 Geo. J. Int'l Aff. 97.

[26]See e.g., Valerie Insinna, 'US Defense Department launches Gremlins drone from a mothership for the first time' (Defense News, 28 January 2020) < https://www.defensenews.com/industry/techwatch/2020/01/28/us-defense-department-launches-gremlins-drone-from-a-mothership-for-the-first-time/> accessed 6 July 2021, and, Lt Col Paul J. Calhoun, 'Gremlins' (*DARPA*) < https://www.darpa.mil/program/gremlins> accessed 6 July 2021.

UAV. [27] And, many other unmanned systems either exist, or are currently in development. These include aerial systems such as drones, but also a variety of land and sea-based systems as well.[28] Unmanned vehicles also come in a variety of sizes, and as research and development allows for much smaller packaging of the necessary technology, they are more regularly being used for tactical, as well as operational purposes.[29] Today, both weapons manufacturers, and end users, are very familiar with robotic weapons systems.

For a variety of reasons, the use of unmanned weapons systems has been particularly controversial.[30] Their introduction into warfare, is undoubtably a factor that enables this present discussion. Nevertheless, it is vital note that any weapons system that requires a human operator to take decision regarding some element of targeting, is not an AWS. The term AWS was coined in 2007 by ethicist Professor Robert Sparrow. He raised a number of the concerns regarding their *potential* emergence.[31] And, with some foresight, he anticipated a coupling of contemporary robotic technologies, with continuing improvements in the field of AI which have largely been made possible by the expansion and the growing influence of the internet and availability of near endless data sources.[32]

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[27] Kyle Mizokami, 'Watch the Navy's Stingray Drone Refuel a Fighter in Midair for the First Time' (Popular Mechanics, 8 June 2021) < https://www.popularmechanics.com/military/aviation/a36650966/watch-navy-stingray-drone-refuel-super-hornet-midair/> accessed 9 June 2021.

[28] See e.g., Scharre (2018), *ibid,* n.20, 102-119, where the author discusses a number of robotic weapons either currently in use, or that are in development around the globe.

[29] In this instance, tactical decisions are considered to be those which support the implementation of military strategy by assigning missions and tasks. Such a task may, for example, look to identify whether an adversary is positioned behind a wall. Operational decisions, on the other hand, regard the planning and conduct of campaigns. An operational task might, for example, be one which requires the monitoring of an entire military unit. A commander may choose to move their own forces based on this operational information, in order to gain a strategic advantage.

[30] A number of the leading discussions are considered in greater detail in Chapter Four. However, see generally e.g., Jaume Saura, 'On the Implications of the Use of Drones in International Law' (2016) 12 Int'l L & Rel. 120, Christof Heyns, Dapo Akande, Lawrence Hill-Cawthorne and Thompson Chengeta, 'The International Law Framework Regulating the Use of Armed Drones' (2016) 65 Int'l & Comp LQ 791, and, Hilly Moodrick Even-Khen, 'Reaffirming the distinction between combatants and civilians: The cases of the Israeli Army's "Hannibal Directive" and The United States' Drone Airstrikes Against ISIS' [2016] 33 Ariz. J. Int'l & Comp. L. 765.

[31] Sparrow(2007), *ibid,* n.15.

[32] For a useful discussion in this regard see, Al Brown, 'Artificial intelligence, Robotics and Conflict' (Pembroke College Oxford, 2018) < https://podcasts.ox.ac.uk/artificial-intelligence-robotics-and-conflict> accessed 6 July 2021.

In the first instance, the debate that ensued from Sparrow's insightful dialogue was restricted to a small number of specialist commentators.[33] More recently however, there is a deluge of academic discussion that has materialised, and from a variety of disciplines. To ensure clarity, the primary focus of this thesis examination is the legal ramifications associated with AWS deployments. And, in this area, there is no shortage of opinion.

At present, the legal debate can be divided into two primary factions—noting that, there is more of a *scale* of opinion, than two diametrically opposed perspectives. Nevertheless, and noting that Chapter One provides the dedicated literature review, the two camps can be summarised as follows. On the one hand and providing the stance that tends to receive the greatest support, is the proposition that AWS cannot be deployed in conformity with international law.[34] Opponents are fearful that states will develop an AWS anyway, and that the civilian population will pay the greatest price. Asa result they implore the UN to prohibit AWS by way of a new international treaty (or at the very least that a moratorium be placed upon their development and use).[35]

On the other hand, a numerically smaller group of commentors offer various arguments in direct support of AWS. The stance of those in this camp is often pragmatic, with some suggesting that AWS will simply prove irresistible to states.[36] They are also keen to point out that AWS are actually no different to existing strategic assets such as tanks,

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[33] See e.g., Armin Krishnan, *Killer Robots: Legality and Ethicality of Autonomous Weapons* (Ashgate Publishing Limited, 2009), Gary E Marchant, Braden Allenby, Ronald Arkin and Edward T Barrett, 'International Governance of Autonomous Military Robots' (2011) 12 Colum Sci & Tech L Rev 272, P. W. Singer, *Wired for War: The Robotics Revolution and Conflict in the 21st Century* (Penguin Press 2009), Ronald Arkin, *Governing Lethal Behavior in Autonomous Robots* (Chapman & Hall/CRC 2009).

[34] In particular, opponents of AWS cite the IHL principles of distinction and proportionality. See e.g., Noel E. Sharkey, 'The evitability of autonomous robot warfare', (2012) 94 INT'L REV. RED CROSS 787, 788. Sharkey is a Professor of Artificial Intelligence and Robotics and Professor of Public Engagement in the Department of Computer Science at the University of Sheffield, UK. He believes AWS could not adhere to the principle of distinction which requires, (i) adequate vision or sensory processing systems, (ii) an adequate, programmable, definition of "civilian', which he suggests is lacking, and (iii) battlefield awareness or common sense. See also, Robert Sparrow, 'Twenty Seconds to Comply: Autonomous Weapons Systems and the Recognition of Surrender' (2015) 91 INT'L L. STUD. SER. US NAVAL WAR COL. 699. Sparrow questions, for example, how an AWS could identify a surrendering combatant, who, under IHL, is no longer targetable by the enemy. In addition, doubting whether AWS could ever adhere a second vital principle of IHL, proportionality.

[35] See e.g., Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, (Human Rights Council, Twenty-third session, Agenda item 3, Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. (UN April 2013)). A/HRC/23/47.

[36] John Yoo, 'Embracing the Machines: Rationalist War and New Weapons Technologies' (2017) 105 Cal. L. Rev. 443, 457.

planes, battleships, and ballistic missiles.[37] Others go further, and refer to the inevitability of AWS, emphasizing the strategic *importance* of maintaining technological superiority over one's enemies.[38]

Most individuals in support of AWS (or, more correctly, certain forms of AWS) acknowledge that by current standards, AWS fall short. For example, they are presently incapable of distinguishing between a combatant and a child holding a toy gun.[39] Nonetheless, AWS deployments could initially be restricted to environments where no civilians were present.[40] The main concern is that if AWS are prohibited absolutely, it will simply deny access to technologies which could ultimately become *more* capable of adhering to international law.[41] And, because machines will are unaccompanied by fear and revenge, for example, some argue that AWS can also eventually become 'more humane than humans' on the battlefield.[42]

In reality, there are truths contained within each of the two primary outlooks. If, for example, the design and development of AWS is led by strategic considerations alone, then many of the concerns raised by opponents are likely to come to fruition. Nonetheless, international law already provides binding obligations that prevent states from blindly chasing a new technology regardless of the consequences.[43] And, by

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[37] *Ibid*, 484.

[38] Michael N. Schmitt and Jeffrey S. Thurnher, 'Out of the Loop: Autonomous Weapon Systems and the Law of Armed Conflict' (2013) 4 HARV. NAT'L SEC. J. 231, 232.

[39] This is an oft-cited example when considering AWS compliance with the IHL principle of distinction, see e.g., HRW 2012, *ibid*, n.15, 31-32. See also, Marco Sassoli, 'Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified' (2014) 90 [i] Int'l L. Stud. Ser. US Naval War Col., 308, 333-334.

[40] E.g., desserts, oceans, including sub-marine, and space. The point here being that in the absence of civilians, there is no requirement to distinguish, and/ or to carry out proportionality assessments.

[41] Generally, Sassoli, *ibid,* n.39.

[42] See generally, Ronald C. Arkin *Governing Lethal Behaviour in Autonomous Robots'* (CRC Press 2009). Also note e.g., Michael N. Schmitt, 'Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics' Harv. Nat. Sec. J. 1, 3 where the author states, '[n]o such weapons have even left the drawing board. To ban autonomous weapon systems altogether based on speculation as to their future form is to forfeit any potential uses of them that might minimize harm to civilians and civilian objects when compared to other systems in military arsenals'. See also, Sassoli, *ibid,* n.39, 310. Here the author correctly notes that only humans are capable of acting inhumanely.

[43] See e.g., art. 36 of the Protocol Additional to the Geneva Conventions (1949), and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (1977) 1125 UNTS 3 (hereinafter additional Protocol I, or simply API). This states: "In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party." The U.K. identify that: 'Article 36 does not prescribe a method or format for weapon reviews: that is for States to determine. This document sets out how the UK gives effect to Article 36, but fully recognises that other States may take a different approach to suit their own procurement and development processes', see, UK weapons reviews < https://www.gov.uk/government/publications/uk-weapon-reviews> accessed 6 July

consulting *all* relevant legal principles, the researcher can determine the lawfulness of individual AWS deployments. This is necessary, because no existing examination of the lawfulness of AWS has yet assessed this emerging technology in light of all the applicable international legal obligations. Consequently, the wider analysis is fragmented, and worse still, led by opinion that is often grounded in a particular commentor's own historical perspective, rather than in fact.

Somewhat detrimentally, however, *all* alternative analyses are fundamentally grounded upon a general definition of AWS - the inherent weaknesses of which have already been established. This thesis rectifies existing shortcomings in several insightful ways, doing so utterly independently. [44] In short, the researcher supports the regulation of AWS as opposed to a prohibition. This hypothesis is, however, aligned with discussions that take place in both camps identified above. It, therefore, uniquely bridges the chasm between the two extremities, grounding the analysis first in law, but also in a pragmatic assessment of the facts.

III Research Methodology.

Section III identifies the methods that are employed by the researcher to ensure the thesis' aims are achieved. This is clearly important, because any legal thesis must be founded upon an explicit research methodology. [45] This methodology not only underpins and defines a research process, but antecedent knowledge of it will allow for

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2021. Arguably, this provision only binds those who are party to API. Notably this does not include the U.S. and Israel. Although the ICRC claim that the art. 36 obligation is customary in nature, and thus binding on all parties regardless of whether or not they are signatories to API, the U.S. dispute this. See generally e.g., Thompson Chengeta, 'Are Autonomous Weapons Systems the Subject of Article 36 of Additional Protocol I to the Geneva Conventions' (2016) 23 UC Davis J Int'l L & Pol'y 65, 67 where the author shows support for the ICRC's position. However, in contrast see, Charles J Dunlap Jr, 'Accountability and Autonomous Weapons: Much Ado about Nothing' (2016) 30 Temp Int'l & Comp LJ 63, 65, where the author notes: 'the United States - which is not a party to Protocol I - does not recognise Article 36 as part of customary international law'.

[44] Clearly, the author has an intention to forward his hypothesis, and to support the arguments he presents. With that in mind it may not be possible to be utterly free from bias. The point is, the traditional divide can be demonstrated by considering the fact that NGOs such as HRW, and the ICRC, rely largely upon abstract concepts such as the Martens Clause, and human dignity in order to support their arguments (See in particular HRW 2018). In contrast, many in support of AWS are dismissive of these undefined concepts, and instead reference their own personal military experiences often citing what life is really like in the 'heat of the battle'. It may be of relevance to noted that that many of the leading voices in the debate, and who often share similar opinions have military or defence backgrounds. See for example, Paul Scharre is a former US army Ranger, William H. Boothby, Michael N Schmitt and John J. Merriam have all been military lawyers/ judiciary, and, for example, Michael C. Horowitz has worked in the Office of the Undersecretary of Defense for Policy in the Department of Defense.

[45] Lina Kestemont, *Handbook on Legal Methodology* (Intersentia 2018), 2.

independent verification, and evaluation, of the overall hypothesis.[46] The following section, therefore, justifies the research strategy that is exercised throughout the following chapters.

As noted, the primary aim of this thesis is to construct a legal framework for regulating AWS deployments.[47] Therefore, because the researcher is recommending that the law should be applied in a certain way, the thesis has a recommendatory research objective.[48] Several research methods can be intrinsically linked to a recommendatory method of research. This includes an inherent associated need for explanatory evaluations of the subject matter.[49] Explanatory evaluations are clearly vital to the current research project because the research is predominantly focused upon assessing the lawfulness of *future* technologies. For that reason, there is very little, if any empirical data that can be used to measure or quantify AWS.

Instead, to introduce a variety of explanatory evaluations, the researcher regularly considers the work of the leading commentators from the relevant disciplines. This is in fact a primary methodology that is employed throughout and should be seen as a form of 'ongoing literature review'.[50] Due to the fact that the research is predominantly angled towards the use of AWS by armed forces, their lawfulness must be evaluated under international law. [51] This is particularly pertinent to this literature-based methodology because Article 38 (1)(d) Statute of the International Court of Justice includes 'the teachings of the most highly qualified publicists of the various nations, as a subsidiary means for the determination of rules of law'.[52]

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[46] *Ibid,* 3.
[47] Kestemont, *ibid,* 73. Here the author identifies different types or of recommendations - specific, which are detailed about what should happen with a particular legal construct, or – framework, which 'set out general guidelines for policy makers…' As previously noted, this thesis forwards the later.
[48] *Ibid,* 17.
[49] *Ibid,* Chapter 3.7 - Methodological Features of a Recommendatory Research Objective. In particular the author highlights the importance of a descriptive, and explanatory evaluation of the subject matter, and the need for the selecting of normative criteria.
[50] See generally e.g., Hannah Snyder, 'Literature Review as a Research Methodology: An Overview and Guidelines' (2019) 104 Journal of Business Research, 333.
[51] Although individual nations will, for example, have contrasting municipal laws that can be applied to the non-wartime behavior of combatants, there is no doubt that the law applicable to armed conflict is of an international character. Kestemont notes, 'legal scholars have to make the sources for the classification explicit, as they determine the angle of the classification. Kestemont (2018), *ibid*. n.45, 33.
[52] Art. 38 (1) Statute of the International Court of Justice (194) 15 UNCIO 335.

With reference to literature, therefore, and indeed the additional sources of law that are contained with Article 38 (particularly international conventions and customary law),[53] this thesis also adopts a doctrinal methodology. The doctrinal approach generally poses the relatively straightforward question - 'what is the law?'[54] With regard to the current thesis, the question that is then asked is - what is the law relating to AWS deployments? This is reflected by aim two (Section I.III above), and this question is generally further distilled to ask – what is the law relating to the various classifications of AWS as identified upon the *Template*?

The doctrinal approach is widely used focused analysis. It is 'described as the "core legal research method", and indeed the "core of legal scholarship"'.[55] Fundamentally, '[i]t is concerned with the analysis of the legal doctrine and how it was developed and applied'.[56] Importantly for the present thesis' future looking narrative, it is only by considering such processes that it is possible to determine how such doctrine is likely to be applied and developed in the future. Indeed, the international law doctrinal scholar *must* carry out an analysis of the relevant treaties, custom, caselaw, and leading scholarly works to determine the law.[57]

At times, this may be more straightforward than at others. Where there is an ambiguity or inconsistency, or, where it is unclear as to whether a legal concept is applicable to a given set of facts – be they actual or hypothetical - the doctrinal researcher must apply

[53] The full text of art. 38, *ibid*, states: 'The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply: (a) international conventions, whether general or particular, establishing rules expressly recognised by the contesting states, (b) international custom, as evidence of a general practice accepted as law, (c) the general principles of law recognised by civilized nations, (d) subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.'

[54] Suzanne Egan, 'The doctrinal approach in international human rights law scholarship' in Lee McConnell, Rhona Smith (eds), *Research Methods in Human Rights* (Routledge 2018), and Salim Ibrahim Ali, Dr. Zuryati Mohamed Yusoff, Dr. Zainal Amin Ayub 'Legal Research of Doctrinal and Non-Doctrinal' (2017) 4 (1) International Journal of Trend in Research and Development, 493, 493.

[55] Egan, *ibid,* in turn citing, Terry Hutchinson and Nigel Duncan, 'Defining and Describing What We Do: Doctrinal Legal Research' (2012) 17 Deakin Law Review 83, 98-101, and, Terry Hutchinson, 'Doctrinal Research: Researching the Jury' in Dawn Watkins and Mandy Burton (eds), *Research Methods in Law* (Routledge, 2013) 7, 10, and generally, 9-15.

[56] Ibrahim Ali *et al*, *ibid*, n.54, 493.

[57] Egan, *ibid*, n.54, 25. This could be said to be reflected in Art. 38 of the Statute of the International Court of Justice (1945) 15 UNCIO 335 (hereinafter ICJ statute). This identifies the sources of international law that the court will apply as: (a) international conventions, whether general or particular, establishing rules expressly recognised by the contesting States, (b) international custom, as evidence of a general practice accepted by law, (c) the general principles of law recognised by civilised nations, and, (d) subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as a subsidiary means for the determination of rules of law.

reason and use it as evidence to support logical conclusions.[58] There are many benefits to applying a doctrinal methodology – otherwise referred to as the 'library, or desk-based - approach'.[59] In the present case, doctrinal scholarship, and its central requirement to constantly consider the relevant supporting commentary, provides the ideal method for supporting the investigation of hypothetical situations in order to determine whether certain existing rules will apply to AWS, and, whether there are consequences to their future deployment.[60]

Another reason the doctrinal approach suits the current aims of thesis is because the purpose of it, is invariably to identify a way in which the law in a certain area could be altered or improved upon.[61] This is reflective of the recommendatory research objective. Moreover, being the 'dominant mode of legal research', it has real-world applications - requiring many of the same skills that are needed in legal practice.[62] It should be noted, however, that this approach is not without critique. One criticism is that it fails to take account of the 'social, economic and political importance of the legal process'.[63] Egan, for one, suggests that scholars who apply a narrow doctrinal approach may risk cutting themselves off from external questions which also need to be answered 'to reach a clear understanding of the law'.[64]

The current researcher is however, committed to carrying out pragmatic analysis, as opposed to a theoretical one. Moreover, in the view of the present author, when the doctrinal approach is combined with the ongoing literature reviewed based analysis, it provides the most suitable way of establishing the lawfulness (or not) of AWS. Nevertheless, there is no need to simply ignore Egan's concern. Instead, to consider a number of the social, economic and political implications, an interdisciplinary approach is used, meaning that a *wide* rather than narrow doctrinal analysis is provided.

To do so, the researcher looks beyond the law codified in the treaties or enshrined into custom, to additional, related, disciplines. The first of these is international relations

[58] Egan, *ibid,* n.54, 25.
[59] Ibrahim Ali *et al*, *ibid* n.54, 493.
[60] *Ibid*.
[61] Egan, *Ibid,* n.54, 27-28.
[62] Egan notes that one key advantage of the doctrinal approach is that it applies the same skills and reasoning as those used by practicing lawyers. But, whereas a lawyer will apply his or her analysis to a set of facts, the scholar will consider how they apply to hypotheticals. Egan, *ibid*, n.54, 27.
[63] Ibrahim Ali *et al*, *ibid,* n.54, 493.
[64] Egan, *ibid*, n.54, 28-29.

(IR). Though international law and international relations do share a common language, it is important to note they do not necessarily share the same 'research interests and scholarly agendas'[65] For this reason, IR is not the only additional discipline that the research methodology reflects. Instead, the author somewhat naturally has regard of a second supporting discipline - strategy. Strategic considerations, and specifically an analysis of the leading strategic literature is vital because, if IR represents the intersection between international law and politics, strategy is the point at which the two meet the concept of *military capabilities*. As noted by Gray for example, the 'strategy bridge…provides an enabling service that allows a polity to use its military power in ways likely to advance its political desires.'[66]

The point here is, in designing and implementing national strategy relating to AWS, a state *must* decide whether it intends to adhere to international legal principles such as fundamental human rights. A historical analysis of human rights compliance may, therefore, be indicative of whether a state is likely to deploy systems such as the autonomous hunter killer drones previously referred to. In other words, when considering future tech, and future adherence to international law, as is necessary for present researcher, strategy provides an invaluable, and oft-tangible source of evidence to help to determine the likelihood of legal compliance.

Egan is correct to (indirectly) identify that political desires, and political wherewithal, is key when considering whether states will seek to build AWS. And, while IR will play a crucial role in helping to clarify the law, strategy is key in determining whether states are likely to support calls for a prohibition.[67] Strategy and IR can, therefore, help to clarify, often opaque, legal principles, and to determine the trajectory of future weapons developments. This mixed-method, or basic interdisciplinary approach,[68] is

[65] See e.g., Jeffrey L. Dunoff and Mark A. Pollack, 'International Law and International Relations: Introducing an Interdisciplinary Dialogue' in Jeffrey L. Dunoff and Mark A. Pollack (eds), *Interdisciplinary Perspectives on International Law and International Relations* (Cambridge 2013). The authors note for example that: World War II served as a watershed event, largely discrediting international law among political scientists…'

[66] See generally, Colin S. Gray, *The Future of Strategy* (Polity 2017), 25. According to Gray strategy, briefly summarized, is the (attempted) achievement of ones desired political ends, through the choice of suitable strategic ways, employing largely military means.

[67] For a useful discussion considering the strategic implications of AWS see, Michael W Meier, 'The Strategic Implications of Lethal Autonomous Weapons' in Jens David Ohlin (ed), *Research handbook on Remote Warfare* (Elgar 2019).

[68] Mathias M. Siems, 'The Taxonomy of Interdisciplinary Legal Research: Finding the Way Out of the Desert' (2009) 7:1, 5-17, Journal of Commonwealth Law and Legal Education, 6-8.

advantageous because it means that the research is not too narrow, rigid, or formalistic.[69] Indeed, by applying the complimenting methodologies identified in this section, this thesis offers an informed and balanced judgment throughout.[70]

Part IV. Chapter Breakdown.

The aims, purpose, and research methodologies have been identified. And the reasons as to why this research is needed have been made clear. Consequently, Part IV provides one last introductory point of focus by way of a chapter breakdown. In the first instance, Chapter One presents a comprehensive review of the applicable literature and offers a more detailed analysis of the existing areas of debate than has been considered to date. This analysis is intended to demonstrate existing lacunae in the scholarship, with particular regard to general definitions, and serve a medium for achieving the aim of constructing a *Template*.

With reference to the *Template*, Chapters Two, Three and Four complete aim two by assessing the use of AWS under the relevant international law disciplines. In the first instance, Chapter Two examines the deployment of AWS with regards to the *jus ad bellum*—the law governing the recourse to force. This analysis considers, for example, whether AWS can operate in adherence with leading *jus ad bellum* principles such as necessity and proportionality. Central to this chapter is the introduction of several rules (including one which ensures that AWS are prevented from autonomously making decisions regarding strategy – which must remain a human endeavor). These continue to be built upon throughout the thesis. Chapter Three scrutinises the compatibility of AWS with the *jus in bello* - the discipline in which much of the existing discussion regarding AWS has taken place. The IHL principles of distinction and proportionality, in particular, will affect where, and how, AWS can be lawfully deployed in armed conflict. Though this chapter concludes in line with the general hypothesis, that AWS are incapable of being demonstrated as inherently unlawful.

[69] *Ibid*, 6. Here Siems identifies four alternative interdisciplinary approaches. His first 'the basic interdisciplinary approach' is the one applied by the present author.
[70] Siems in turn citing, Martijn Hesselink, 'A European Legal Method On European Private Law and Scientific Method' (2009) 15 Eur LJ 20, 29-30. Hesselink states that: 'typically an approach where different perspectives are taken into account will lead to more informed and more balanced judgement'.

It is widely accepted that IHL is the correct body of law from which to assess the introduction and use of AWS in armed conflict.[71] Indeed, this was confirmed by the Group of Governmental experts (GGE) convened in Geneva in November 2017.[72] As previously clarified by the International Court of Justice (ICJ),[73] International Human Rights Law (IHRL) remains applicable during armed conflict.[74] Therefore, an analysis of AWS in regards to this third legal discipline that is applicable to AWS during battlefield deployments is considered in Chapter Four. The Chapter Four analysis considers the applicability of human rights obligations to extraterritorial warfare, and, for example, whether killing a human with an AWS should be considered arbitrary and in breach of the right to life. Once again, several rules are distilled from this analysis.

As previously noted, this body of research is intended to have a predominantly legal nature. Nevertheless, Chapter Five conducts an examination of the moral and ethical complexities surrounding the introduction of AWS. This is necessary, largely because of the various ethical clauses that have been inserted into codified international law. Chapter Five also assesses AWS according to *just war theory*, a centuries-old theory that has been used to identify whether a particular use of force or war should be considered 'just'. In this instance, it is used to assess whether waging war with an AWS is just.

A perceived 'accountability gap' is dealt with in Chapter Six. Importantly, this chapter contrasts with the arguments of the leading commentors in opposition to AWS – noting that international does not require for a human to be held to account for international crimes that would be committed by an AWS. However, the analysis does acknowledge that there should be a provision included within the guiding principles that at least

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[71] Many contend that the principle of *Lex specialis derogat legi generali* applies in where violence amounts to an armed conflict.

[72]See, United Nations (UN) Report, Group of Governmental Experts 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 (November 2017) para. 5. Available at, https://www.unog.ch/80256EDD006B8954/(httpAssets)/B5B99A4D2F8BADF4C12581DF0048E7D0/$file/2017_CCW_GGE.1_2017_CRP.1_Advanced_+corrected.pdf > accessed 20 August 2018.

[73] *Legality of the Threat or Use of Nuclear Weapons* (Advisory Opinion) I.C.J. Rep 226 (8 July 1996) para 25. (hereinafter *Nuclear Weapons Advisory Opinion*) Here it reads, 'The Court observes that the protection of the International Covenant on Civil and Political Rights does not cease in times of war, except by operation of Article 4 of the Covenant whereby certain provisions may be derogated from in a time of national emergency. Respect for the right to life is not, however, such a provision. In principle, the right not arbitrarily to be deprived of one's life applies also in hostilities.'

[74] *Ibid.*

makes it possible to identify an irresponsible, or reckless deployment of AWS. This is achieved by introducing the concept of *command responsibility,* which the author identifies, is a suitable method for assigning accountability.

By way of a summary, Chapter Seven presents the rules that were identified throughout the previous chapters analyses, holistically, by way of a set of *Guiding Principles.* These are the end-product of the unique, fully inclusive, and interdisciplinary analysis. The *Guiding Principles* regulate the development and use of AWS. They are intended to be viewed as a stand-alone document, as well as a summary, or pre-conclusion. In conclusion, the Chapter Eight provides a summary, and the researcher closing thoughts. Here it is noted in particular that, although the development and use AWS must be restricted, their potential strategic and humanitarian benefits are simply too beneficial to prohibit.

CHAPTER ONE. LITERATURE REVIEW.

The introduction identified that the researcher's primary aim is to construct a legal framework for regulating the use of Autonomous Weapons Systems (AWS). Noting that despite the urgent need for such an apparatus, nothing currently exists. The are several reasons for this lacuna, but primarily it is because no one knows exactly what an AWS is. Consequently, and somewhat uniquely, the literature review in this chapter is undertaken with the specific goal of closing the definitional void. This is ultimately achieved by constructing the *Template* – the thesis' unique multi-axis classification tool. Only once this has been formulated, can the analysis in subsequent chapters continue on and establish the lawfulness of AWS (or not) under the three legal disciplines that are relevant to their deployments.

PART 1: Constructing a General Definition for Autonomous Weapons Systems.

While the overarching purpose of Chapter One is to demonstrate the operation and purposefulness of the *Template*, as a definitional tool, it does have a relatively complex nature (*see* part 3 of the current chapter). The analysis conducted in Part 1 is undertaken to construct a *general definition* of AWS, which is more akin to some of those already posited by various actors. This is provided because *general definitions* are of *limited* use – offering, if nothing else, a comparatively lucid clarification. Nonetheless, Part I is accompanied by a caveat; It the researchers overwhelming hypothesis that *general definitions* are too vague, and therefore too imprecise, to support a comprehensive legal analysis. With that in mind, the first section considers the leading works in this area and demonstrates why there is an urgent need to address the definitional issues.

The literature regarding AWS began when, with reference to the United States (U.S.) Army's Future Combat Systems Project,[75] Robert Sparrow first explored the concept

[75] From 2003 to 2009, FCS was the U.S. Army's primary modernization program. It aimed to develop a number of both manned and unmanned weapons systems, in order to ensure the U.S. remained ahead of its adversaries. For a temporally relevant discussion regarding the potential benefits of FCS. See, the report of the United States Government Accountability Office 'DEFENSE ACQUISITIONS: Future Combat Systems Challenges and Prospects for Success' (16 March 2005). <https://apps.dtic.mil/dtic/tr/fulltext/u2/a469304.pdf> accessed 23 March 2020. For a retrospective discussion regarding the success (or not) of the project. See e.g., Stew Magnuson, 'Future Combat Systems did not truly die' (*National Defense*, 26 September 2017) https://www.nationaldefensemagazine.org/articles/2017/9/26/future-combat-systems-didnt-truly-die

in 2007.[76] He argued that it would be unethical to deploy what he colloquially referred to as *Killer Robots* because of the unacceptable lack of human accountability should a war crime mistakenly be committed by such a weapon.[77] Some five years later, Human Rights Watch (HRW) in collaboration with the International Human Rights Clinic at Harvard, introduced the concept of *Killer Robots* to the public at large.[78] Their emphasis was placed upon subsequent U.S. policy,[79] and in the first of many reports regarding AWS, they cited fundamental legal concerns as well as a restating of the potential ethical implications.[80]

In 2014 a panel of experts began to meet informally in to discuss emerging weapons technologies in the area of AWS.[81] And, in 2016 that group was formally recognised as a UN Group of Governmental Experts (GGE) who were to work under the auspices of the Convention on Certain Conventional Weapons (CCW).[82] The GGE's remit is to carry out an 'open-ended' analysis of the issues surrounding AWS.[83] However, and

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accessed 23 March 2019, and, Sebastian Sprenger , '30 Years: Future Combat Systems – Acquisition Gone wrong' (*Defense News*, 25 October 2016) < https://www.defensenews.com/30th-annivesary/2016/10/25/30-years-future-combat-systems-acquisition-gone-wrong/> accessed 23 March 2020.

[76] In particular, Sparrow (2007), *ibid,* n.15, 62, identifies the journey towards AWS started with the 'robot army' the U.S. was to have ready for deployment by 2012.

[77] *Ibid*.

[78] See generally, HRW 2012, *ibid*, n.15.

[79] In particular HRW reference, Department of Defense Directive 3000.09, 'Autonomy in Weapons Systems', (21 November 2012) (hereinafter DoDD 3000.09) <https://www.hsdl.org/?abstract&did=726163> accessed 6 July 2021.

[80] HRW (2012) primary legal arguments sought to establish that AWS cannot adhere to the international humanitarian law (IHL) principles of distinction and proportionality. They state that as a result, killer robots should be prohibited. Chapter Three provides the analyses of AWS according to IHL, thus, in order to avoid repetition, this is not considered further at this juncture.

[81] The informal group met in Geneva 3 times, (i) 13–14 November 2014, text available at < https://documents-dds-ny.un.org/doc/UNDOC/GEN/G14/048/96/PDF/G1404896.pdf?OpenElement> accessed 23 March 2020, (ii) 13–14 November 2015, text available at https://documents-dds-ny.un.org/doc/UNDOC/GEN/G15/042/88/PDF/G1504288.pdf?OpenElement accessed 23 March 2020, and, (iii) 11-15 April 2016, advanced report available at https://www.unog.ch/80256EDD006B8954/(httpAssets)/DDC13B243BA863E6C1257FDB00380A88/$file/ReportLAWS_2016_AdvancedVersion.pdf accessed 23 March 2020. See also, https://dig.watch/process/gge-laws accessed 10 June 2021.

[82] CCW, *ibid*, n.2. Available at, <https://www.icrc.org/en/doc/assets/files/other/icrc_002_0811.pdf> accessed 9 June 2021.

[83] The U.N. provide that 'In 2016, the Fifth Review Conference of the High Contracting Parties to the Convention on Certain Conventional Weapons (CCW) established an open-ended Group of Governmental Experts (GGE) on emerging technologies in the area of lethal autonomous weapons systems (LAWS), see e.g.,< https://www.unog.ch/80256EE600585943/(httpPages)/F027DAA4966EB9C7C12580CD0039D7B5?OpenDocument> accessed 23 March 2020. To date, the GGE has met in Geneva, 13–17 November 2017, report available at https://www.unog.ch/80256EDD006B8954/(httpAssets)/B5B99A4D2F8BADF4C12581DF0048E7D0/$file/2017_CCW_GGE.1_2017_CRP.1_Advanced_+corrected.pdf accessed 23 March 2020, 9–13 April 2018 and 27-31 August 2018, report available at https://undocs.org/en/CCW/GGE.1/2018/3 accessed 23

perhaps somewhat unfortunately, their progress has been slow. Indeed, despite their adoption of their own set of 11 guiding principles in 2019,[84] it remains unclear to what exact form of AWS these are intended to be applied to.

The lack of a suitable, widely agreed definition is undoubtably a primary reason why the discussion regarding AWS is moving somewhat leisurely.[85] A significant problem, however, is that while the dialogue in this regard has somewhat stalled, the range of weaponry to which it would be applicable is growing at pace. The Part 2 examination demonstrates that various existing general definitions do exist. The researcher has chosen to construct their own, however, by deconstructing the term 'AWS' into its three constituent parts. These are, (I) Autonomy, (II) Weapon, and (III) Weapons Systems. Doing this is more suitable then merely restating an existing alternative general definition of AWS because it provides the researcher with an excellent opportunity carry out an original and authoritative, in-depth analysis of each element. The intention is that once these elements have been considered independently, the resulting interpretations can be utilised holistically to provide the thesis' working general definition.

1.1.2 First Key Components of Autonomous Weapons Systems: Defining Autonomy.

This section considers the works of the leading authors in this area to define the first of the three elements of AWS – *autonomy.* This is, perhaps somewhat surprisingly, an analysis which the majority of contributors tend to overlook. One author who is particularly well written in this regard, however, is Paul Scharre. As a result, his work features throughout. This section will demonstrate, that although the present researcher's hypothesis is aligned with many of contributors considered, it differs significantly from the majority when considering the matter of whether existing supervised weapons should be considered autonomous. Indeed, by discounting the classification of *supervised autonomy* altogether, this thesis adopts the controversial

March 2020. Most recently on 13–15 November 2019, report available at https://undocs.org/CCW/MSP/2019/9 accessed 23 March 2020. Many of the experts that took part in the original informal meetings, are also members of the GGE.

[84] See, Annex III (CCW, 2019) https://ccdcoe.org/uploads/2020/02/UN-191213_CCW-MSP-Final-report-Annex-III_Guiding-Principles-affirmed-by-GGE.pdf accessed 10 June 2021 (hereinafter *CCW Principles*).

[85] See generally e.g., Horowitz, *ibid,* n.12.

position that AWS are not weapons of the future at all, but weapons of the past and present.

Of the three deconstructed elements considered, the first 'autonomy' and/ or 'autonomous' are unquestionably the most difficult to define. In pure linguistic terms, *autonomous* is the amalgamation of two ancient Greek words *auto*, meaning self, and *nomos*, meaning law.[86] Its literal, or classical definition, therefore, refers to an ability to self-govern, or, to make one's own choices free from further coercion.[87] Today, this could be applied to a geographical region, or institution, as much as can to individuals. Autonomous robots will certainly require the ability to *act free from human coercion* - or else they would not be autonomous. Therefore, the classical reference is in some way relevant. This description alone, however, cannot sufficiently capture the essence of *machine autonomy*, and certainly not in regard of *weapons systems*.

In the philosophical sense, Emanual Kant believed *autonomy* refers to one's *will*, and the inherent *requirement* for an individual to act according to their sense of moral duty - rather than merely in furtherance of their desires.[88] More recently, leading

[86] See e.g., Joint Air Power Competence Centre (JAPCC), 'Future unmanned Systems Technologies: Legal and Ethical Implications of Increasing Automation', 9. Here, the report notes further that: '[t]he ancient Greek's term 'autonomos' consists of the two syllables 'auto' and 'nomos' which literally translate to 'self' and 'law,' hence, when combined, were understood to mean 'one who gives oneself one's own law. 'The ancient Greek word 'autonomos' had its antonym in the word 'eteronomos'. 'Autonomos' translates to 'I give myself my laws' or 'the law comes from me' whereas 'eteronomos' translates to 'someone else gives me his laws' or' the rules come to me from another subject different from me'.

[87] See, *The Oxford Dictionary of English*, (Oxford University Press, 2020). This states: 1. [mass noun] The right of condition of self-government: *between the First and Second World Wars, Canada gained greater autonomy from Britain*, [Count Noun] a self-governing country or region: *The national autonomies of the Russian Republic*, freedom from external control or influence, independence: *the courts enjoy a considerable degree of autonomy – economic autonomy is still a long way off for many women…*'

[88] See e.g., Immanuel Kant, Critique of Pure Reason, J M D Meiklejohn (tr) (Bell and Sons 1890) 43. Also see, JAPCC Report, *ibid,* n.86, 9 noting: 'At the heart of his moral theory is the idea of autonomy which he described as '[...] the will of every rational being as a will that legislates universal law.' Also see, Tetyana Krupiy, 'Unravelling Power Dynamics in Organizations: An Accountability Framework for Crimes Triggered by Lethal Autonomous Weapons Systems' (2017) 15 Loy U Chi Int'l L Rev 1, 16. Krupiy also Cites, David Ronnegard, *The Fallacy of Corporate Moral Agency* (Springer 2015), 11. Krupiy argues that to have moral agency, the following conditions should be satisfied: 1) an ability to intend an action, 2) a capacity to autonomously choose the intended action and 3) capacity to perform an action. As is noted elsewhere in the thesis, it is doubtful whether AWS can display 'intent'.

philosophers such as Joseph Raz,[89] and Jeremy Waldron,[90] continue to link autonomy with morality, and also concepts such as human dignity, and the rule of law.[91] In this sense, autonomy appears to be less applicable to robots— it being very unlikely that AWS will ever be capable of displaying moral judgement in the same way as a sentient being. Indeed, commentators such as Tetyana Krupiy argue that a distinguishing positive feature of AWS is that they lack autonomy in this sense.[92]

Scharre suggests that when considering machines specifically, the term *autonomy* should simply indicate 'the ability for a machine to perform a task or function on its own'.[93] Most posit similar hypotheses including, for example, the International Committee of the Red Cross (ICRC) who note, machine autonomy means 'the ability of the system to act without direct human intervention'.[94] Likewise, the Stockholm International Peace Research Institute (SIPRI) suggest that autonomy is the 'ability of a machine to execute a task, or tasks, without human input, using interactions of computer programming with the environment.'[95]

Prima facie, the ability to complete a task independently does bear some semblance to the ability to self-govern (in the classical sense) - in that the machine is capable of operating free from further human coercion. However, one problem with this description alone is that '[n]ot all tasks are equal in their significance, complexity and

[89] See generally e.g., Joseph Raz, *The Authority of Law: Essays on Law and Morality* (OUP 2nd Edn, 2009), Chapter 11. Here, for example, the author notes: 'observance of the rule of law is necessary if the law is to respect human dignity. Respecting human dignity entails treating humans as persons capable of planning and plotting their future. Thus, respecting people's dignity includes respecting their autonomy, their right to control their future.'
[90] See generally, Jeremy Waldron, *One Another's Equals: The Basis of Human Equality.* (The Belknap Press of Harvard University Press 2017). Waldron argues, for example, that the case for moral equality rests on the human capacities of 'reason, autonomy, moral agency, and the ability to love.'
[91] Generally, Raz, *ibid*, n.89.
[92] See e.g., Krupiy, *ibid*, n.88, 16. Also see, as citied by Krupiy, Markus Wagner, 'Taking Humans Out of the Loop: Implications for International Humanitarian Law', 21 J.L., Info. & Sci. 1, (2011), 5.
[93] Scharre (2018), *ibid*, n.20, 27.
[94] ICRC, 'Autonomy, artificial intelligence and robotics: Technical aspects of human control' (2019, ICRC), 7. Available at, https://www.icrc.org/en/document/autonomy-artificial-intelligence-and-robotics-technical-aspects-human-control accessed 10 June 2021.
[95] Vincent Boulanin and Maaike Verbruggen, 'Mapping the Development of Autonomy In Weapons Systems', (Stockholm International Peace Research Institute, November 2017), 5. Available at, https://www.sipri.org/sites/default/files/2017-11/siprireport_mapping_the_development_of_autonomy_in_weapon_systems_1117_0.pdf accessed 12 June 2021. At n.1 the authors also identify, Andrew Williams, 'Defining autonomy in systems: challenges and solutions', in A. P. Williams and P. D. Scharre (eds), *Autonomous Systems: Issues for Defence Policymakers* (NATO, 2015).

risk'.[96] For example, the term *autonomous robots* mean very different things to different people. Indeed, as noted by HRW, this is central as to why the overall definitional enquiry is problematic.[97]

This can be demonstrated by considering the following question; What is an autonomous robot? Here, to answer, a reader may point to any one of the growing number of machines that are capable of *independently* mowing a lawn.[98] However, another might easily envisage something altogether more advanced such the humanoid robots that are repeatedly offered up by Hollywood movie studios.[99] The trouble is, both readers would be correct. Indeed, as would any number of others offering something, or perhaps anything, in between. Clearly, Scharre is correct to also point out that 'the consequences if the machine fails to perform the task appropriately are very different.'[100]

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[96] *Ibid*. This can be demonstrated by considering the two examples previously provided. The first robot's task is cutting a lawn, and perhaps returning to the base-station when appropriate (e.g., to recharge). Most individuals would likely not consider these tasks especially significant, nor do they pose a significant risk. The lawn cutting robot does clearly have decision-making capabilities, but these are not particularly complex. In contrast, an advanced humanoid robot would have very different factors to consider. For example, if it was used as a direct replacement for a human combatant, such as an infanteer, it would need be delegated an almost infinite number of tasks. These might include, sensing and/ or scanning the environment in order to remain spatially aware, distinguishing potential targets from non-military objects, and applying force in order to defeat an enemy combatant or destroy an enemy object. As stated in a British Army information document states, as close combat warriors an infanteer is 'trained to be ready for anything, anytime, anywhere'. See, 'Who we are: The Infantry'. https://www.army.mod.uk/who-we-are/corps-regiments-and-units/infantry/ accessed 5 May 2020.

[97] *Ibid.* Also see, HRW 2012, *ibid*, n.15, n.4. HRW acknowledge, for example: that '[d]ue to different definitions and understandings, these terms do not necessarily mean the exact same thing to various experts'.

[98] See for example, Terra Mows (iRobot) < https://www.irobot.co.uk/en-GB/Terra?gclid=CjwKCAjwoZWHBhBgEiwAiMN66YlXR8N62omTK4oXwQ-YjnoH9ObaxNusDX_lsMCkezeXMwJTv9nmERoCEKEQAvD_BwE> accessed 7 July 2021, Automower: Robotic Lawnmowers from Husqvarna (*Husqvarna*) < https://www.husqvarna.com/uk/products/robotic-lawn-mowers/?gclsrc=aw.ds&gclid=CjwKCAjwoZWHBhBgEiwAiMN66fymP6kRdYcwgZdZCvUmxyu5bDM_YoKF24Z2A5l1Ncmo646TMTc8shoCuewQAvD_BwE> accessed 7 July 2021, and e.g., iMow (Stihl) < https://shop.stihl.co.uk/pages/imow?utm_source=google&utm_medium=cpc&utm_campaign=STIHL%20Brand%20-%20iMow&utm_content=Exact&gclid=CjwKCAjwoZWHBhBgEiwAiMN66V62EdixjIfDFAmQNTh5NpmwPTW8i_KTQ3EGQxQtb3vqpO1u5I51nxoC_vMQAvD_BwE> accessed 7 July 2021.

[99] Perhaps noting, in particular, the Terminator franchise of movies in which the fictional SKYNET AI system (what would be classified on the *Template* as a L4AWS), launches an overwhelming and apocalyptic attack upon humanity. For a synopsis see e.g., https://terminator.fandom.com/wiki/The_Terminator_(film) accessed 12 June 2021.

[100] *Ibid*. With regard to the two examples provided, the consequences of the robot lawn mower failing to carry out its task is simply that the grass will not get cut. If the machine malfunctions, it is likely there will be there some kind of superficial damage to the home or garden at worse. In contrast, an infanteer's "task" is to defeat the enemy through close combat. Given that modern armed-conflict is increasingly urbanized, this would, not least, pose a substantial risk to the civilian population. Indeed, the

To further distill his discussion, Scharre posits that this ability to compete a *task* independently of human oversight is just the first of three, dimensions to autonomy.[101] And, his second dimension is one that is deeply embedded within the existing debate regarding AWS.[102] It accounts for the *relationship* between humans and machines, and while this is pertinent to the present matter of defining autonomy, the following analysis will demonstrate why it is also a key factor with regard to the wider hypothesis.

In the first instance, the three types of human-machine interaction which are generally recognised are, (i) human-in-the-loop systems, (ii) human-on-the-loop systems, and (iii) human-out-of-the-loop systems. However, while widely utilised,[103] it is not always exactly clear how an individual intends for them to apply. According to Scharre, these three system types can an also be referred to (correspondingly) as, (i) semi-autonomous, (ii) supervised-autonomy, and (iii) fully autonomous.

According to Scharre's interpretation, the human-machine level interaction that exists between the home-owner and the robot cutting the lawn, is supervised autonomy – i.e., a *human on the loop*. He argues this is the case, regardless of whether the machines owner is present, due to the fact that a 'human user can observe the machine's behavior and intervene to stop it, *if required'* (emphasis added).[104] According to Scharre, a fully autonomous system is different, because it can sense, decide and act without human supervision.[105]

There is, however, a significant issue with creating a distinction between supervised-autonomy and full autonomy. It is that many semi-autonomous machines have an *automatic* mode. And, once this activated, they may function at speed far in excess of human comprehension. The ability to do so, may even typically be at the heart of the

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consequences of the robot infanteer failing to adequately carry out it its delegated tasks could be nothing less than catastrophic.

[101] Scharre, *ibid*, n.20, 28.

[102] See Generally, DoDD 3000.09, *ibid,* n.79, Markus Wagner, Taking Humans Out of the Loop: Implications for International Humanitarian Law, (2011) 21 J. L. INFO. & SCI. 155, Scharre, *ibid,* n.20, 28-31, Schmitt, *ibid*, n.42, 10-13, generally, Schmitt & Thurnher, ibid, n.38, and HRW (2012), *ibid,* n. 15.

[103] *Ibid.*

[104] Scharre, *ibid,* n.20, 29-30. The author similarly refers to a robot vacuum cleaner to make the same distinction. For an example see e.g., Roomba Vacuums (*iRobot*) https://www.irobot.co.uk/roomba?gclid=CjwKCAjwoZWHBhBgEiwAiMN66RkI_-CLC29cRl0AYTzLKoQQ6Ywtl99X5XmHkDYuK3DmBOla15IFaxoCJ7EQAvD_BwE accessed 7 July 2021.

[105] Scharre, *ibid*, n.20, 30 (these concepts are considered further below).

reasons why the automatic mode exists in the first place. An example that is particularly relevant to the present discussion is the MK 15 Phalanx Weapons system.[106]

Figure 1: The MK 15 Phalanx.

The Phalanx is a *Close In Weapons System (CIWS)*, that has been in operation for over 30 years. It is currently used by the U.S. and 24 of its allies around the world.[107] It is a 6-barrel rotating Gatling gun that fires 20mm rounds,[108] and it is positioned upon almost every U.S. Naval vessel currently deployed to protect against air-borne threats such as *anti-ship missiles (ASM)* and attack aircraft.[109] A land-based version also exists.

[106] US Navy Fact File. MK15 - Phalanx Close-in Weapons System (CIWS), available at http://www.navy.mil/navydata/fact_display.asp?cid=2100&tid=487&ct=2 accessed 1 May 2020.
[107] See, Phalanx Weapon System (*Raytheon Missiles and Defense*) https://www.raytheonmissilesanddefense.com/capabilities/products/phalanx-close-in-weapon-system accessed 7 July 2021.
[108] The Phalanx can also be adapted to fire defensive rockets, see, *ibid*.
[109] Raytheon, *ibid*, n.107.

This is referred to as the C-RAM.[110] The C-RAM is fully mobile, and therefore, universally deployable.[111]

No matter the incarnation, CIWS have a number of operational modes. This includes a human-in-the-loop setting – what Scharre calls a 'semi-autonomous' weapon – meaning a human authorization each use of force. In addition, however, both systems also have an automatic, or 'casualty' mode which is engaged should a CIWS human operator become overwhelmed by the scale and speed of an attack.[112] Once the switch to automatic is made, a CIWS independently identifies, tracks, engages, and destroys individual threats.[113]

As per Scharre,[114] the prevailing school of thought is that even when a machine such as this is operating in automatic mode, a human supervisor can cease operation or take back operational control should the Phalanx malfunction, or, for example, target a 'friendly' platform.[115] However, and by way of reminder, the very reason the mode is engaged is because a human operator has become overwhelmed by the speed of an attack. Under such circumstances, the present researcher question whether the operator can realistically be deemed to be acting in a supervisory capacity.

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[110] See e.g., Forward Area Air Defense/ Counter- Rocket, Artillery and Mortar Command and Control (FAAD/C-RAM C2) [Fact Sheet] (*Northrop Grumman*) https://www.northropgrumman.com/wp-content/uploads/L-0700-Forward-Area-Air-Defense-FAAD-CRAM-C2-Datasheet-1.pdf accessed 21 April 2021. See also, [Letter of Intent for future C-Ram Developments] Rapidly Deployable Mobile Counter Rockets Artillery and Mortar (C-RAM) (*NATO*) Available at, https://www.nato.int/nato_static_fl2014/assets/pdf/2020/10/pdf/2010-factsheet-c-ram.pdf accessed 21 April 2021.

[111] *Ibid.*

[112] See e.g., Horowitz, *ibid*, n.12, n.36.

[113] See e.g., Ryan Jenkins, 'Robot Warfare' in Anthony F. Beavers (ed) *MacMillan Interdisciplinary Handbook, Philosophy: Technology* (Macmillan, 2018).). The PDF citied hereinafter, however, is Ryan Jenkins, 'Robot Warfare' available at < https://www.academia.edu/35004778/Robot_Warfare> accessed 7 July 2021. At pp. 2 the author notes: 'The Phalanx system and its progeny are capable of tracking several thousand targets at once— each the size of a softball and moving several times the speed of sound—and engaging them from as far as two miles away. Suffice to say, this is a computational task that no human being, or team of humans, is capable of replicating.

[114] Scharre, *ibid*, n.20, 45-46.

[115] See e.g., P. Scharre and Michael C. Horowitz, 'Working Paper: An Introduction to Autonomy in Weapons Systems' (Center for New American Security, 2015). The authors note for example that '[m]achines that can perform a function entirely on their own but have a human in a monitoring role, with the ability to intervene if the machine fails or malfunctions, are often referred to as "human-supervised autonomous" or "human on the loop."' See also, Scharre, *ibid,* n.20, 29, stating 'a human supervisor can observe the machines behavior and intervene to stop it, if desired'. In addition, DODD 3000.09, *ibid,* n.79, suggests 'human-supervised autonomous weapon systems that are designed to allow human operators to override operation of the weapon system'.

The point here is that if it is only for 20 or 30 seconds at a time, it is more accurate to state the operator is merely observing. In such a relatively short period of time however, a CIWS (and all other weapons that can operate in a casualty or automatic mode) are object independently making targeting decisions regarding target identification, order in which the individual threats are to be engaged, and moreover destroyed. And, importantly, they are taking the decision to act without further human coercion. It is, in other words, if only for 20-30 seconds at a time, autonomous.

Although this is not a widely supported perspective, it is one which is also aired by Rebecca Crootof.[116] She argues that the Scharre *et al* distinction only adds to the confusion.[117] Moreover, with significant observation, she also notes that while a human *may* supervise the operation of a weapons system such as the Phalanx, there is no *requirement* for the human to do so.[118] The current author refers to this as the *illusion of human supervision*. Consequently, the supervision distinction is, in reality, little more than a moot point.[119]

Scharre's third and final dimension of autonomy refers to the spectrum of machine 'intelligence'.[120] He identifies three levels within this spectrum, (i) automatic, (ii) automated, and (iii) autonomous.[121] These are, once again, widely referenced within the literature.[122] Automatic systems are those which respond to basic inputs and following basis rules to reach a logical outcome.[123] These differ from automated, and autonomous because systems because they are threshold based - meaning there is often no *decision* to make. [124] Such systems are highly predictable, but not very good at completing any task other than the one for which it was designed. In contrast, an automated system considers a number of potential options before acting.[125] Some automated systems may appear complex to the untrained eye, but they are nevertheless

[116] See generally, Crootof, *ibid,* n.5.
[117] *Ibid,* 1850.
[118] *Ibid.*
[119] *Ibid.*
[120] Scharre, *ibid,* n.20, 30.
[121] *Ibid.*
[122] See e.g., Crootof, *ibid,* n.5, 1864, and William H. Boothby, *Conflict Law: The influence of New Weapons Technology, Human Rights and Emerging Actors* (T.M.C. Asser Press 2014), 104. Not however that Boothby suggests that care must be taken, and a distinction drawn, between automatic and autonomous.
[123] *Ibid.*
[124] Scharre, *ibid,* n.20, 30.
[125] Scharre, *ibid,* n.20, 31.

also rules-based.[126] Given sufficient knowledge of its inputs and parameters, its behavior should be predictable.[127]

The third spectrum of intelligence, and that which is clearly the most relevant to the present researcher, is autonomous intelligence. Here, a machine has flexibility as to how it completes the task that has been assigned to it.[128]In other words, these machines are goal-oriented, but self-directed.[129] Scharre provides the example of a self-driving car—noting that although such vehicles require the destination to be pre-programmed by a human, the car makes the majority of decisions as to how to get there. As a result, fully autonomous systems are capable of completing increasingly complex tasks, though with the potential disadvantage that they are less predictable.

Unlike Scharre's discussion regarding the distinction between *types* of autonomy, his elucidation upon the different levels of machine intelligence is relatively uncontroversial. Perhaps the most troublesome issue here is that it is not always clear within which category a particular technology should sit.[130] For instance, the robot lawnmower is very similar to an autonomous vehicle.

The human operator specifies the goal - cut the lawn, but they cannot specify every action – avoid the cat. The mower is therefore like a vehicle, in that it is programmed with the 'flexibility to decide when to stop…[and]… go…in order to accomplish its goal'.[131] A robot mower might also be identified as a simpler automated system because it merely considers 'a range of inputs',[132] and weighs 'several variables before taking an action'.[133]Indeed, in many instances it is arguable that 'the distinction…is principally in the mind of the user'.[134]

An example of a *weapon* that can be used to demonstrate the subtleness of this third dimension are anti-personnel land mines. To some extent, these weapons are very autonomous, due to the fact that once they have been positioned, there is no human-in-

[126] *Ibid.*
[127] *Ibid.*
[128] *Ibid.*
[129] *Ibid.*
[130] Scharre notes for example that the lines are often 'blurry'. Scharre, *ibid*, n.20, 32.
[131] *Ibid.*
[132] Scharre, *ibid,* n.20, 31.
[133] *Ibid.*
[134] Scharre, *ibid,* n.20, 33

the-loop with regards to the application of force. Instead, the weapon itself *decides* upon whether or not to detonate. However, although they clearly pose a significant risk to any individual that is positioned near to where a landmine is positioned, there is no flexibility as to how the weapon achieves the goal that has been assigned to it. Its task is simply to detonate, *automatically*, once the pressure threshold is met. Therefore, while AWS do exist in the form of weapons such as the Phalanx, it would be incorrect to classify an anti-personnel mine as such.

One way machine autonomy can be summarized its ability to *decide* (from a number of alternatives), how it will perform a task (or tasks). This is sympathetic to the Ancient Greek understanding of autonomy, which can be applied to the ability to *act* free from coercion. The simpler the task is, the less likely a machine will need an autonomous level of sophistication. The prevailing view with regard to AWS, is that only human-out-of-the-loop systems, with a highly sophisticated levels of artificial intelligence, should be considered fully autonomous.

Although it can be influential in helping to identify machine autonomy, task sophistication should not be a prerequisite requirement of autonomy. The Phalanx, for example, is a machine that cannot differentiate between friend or foe.[135] It is designed with a single purpose in mind. It is purely a defensive system, and one which is only capable of operating in the position in which it is fixed. Thus, arguably, it is a relatively unsophisticated system as compared to some of the AWS of the future. Nevertheless, when used in 'automatic' mode the Phalanx *can* sense, decide and act, independently of real-time supervision.[136] With that in mind, the following definitional paragraph is offered, though this is intended, at this stage to refer to wider machine autonomy, rather than strictly to AWS,

[135] Identification Friend or Foe (IFF) technology is a military, radar-based technology that allows a system to distinguish between certain targets. Raytheon for example state it, is an identification system designed for command and control. It enables military and civilian air traffic control interrogation systems to identify aircraft, vehicles or forces as friendly and to determine their bearing and range from the interrogator. See, Identification Friend or Foe (IFF) (Raytheon Intelligence and Space) < https://www.raytheon.com/capabilities/products/iff> Accessed 7 July 2021.

[136] As previously noted, Scharre, *ibid,* n.20, 30, identifies that these as the three actions a fully autonomous machine is capable of carrying out.

To be considered autonomous, an AI or EAI,[137] *must have a degree of flexibility as to how it achieves the task delegated to it, while remaining free from human coercion, but not necessarily free from human supervision.*

1.1.3 Second Key Components of Autonomous Weapons Systems: No. 2, Weapons.

The remainder of Part 2 examines the two additional elements that are encapsulated by the term AWS. The first of these examinations seeks to provide a definition for the 'narrower' concept - weapons. This must be established before the comparatively 'wide' concept of weapons *systems* can be defined. The question that is considered in the immediate sub-section is, therefore, what constitutes a weapon for the purposes of armed conflict?

While there is considerable reference to certain *types* of weapons, both customary and treaty law are relatively quiet about what actually constitutes a weapon.[138] In lieu of a positive legal definition, and the development of which is beyond the remit of the present thesis, the present author utilises an uncontroversial interpretation provided by William H Boothby.[139] He summarizes that,

> '[a] weapon is an offensive capability that is applied, or that is intended or designed to be applied, to a military object or enemy combatant. A destructive, damaging of

[137] As noted in the introduction, the debate surrounding AWS largely focuses upon embodied artificial intelligence (EAI), in other words, Killer Robots. However, the researcher also defines non-tangible autonomous cyber-weapons as AWS where they meet the same operational criteria.
[138] Prohibitive or regulatory weapons treaties include, The Declaration of Saint Petersburg (1868): Regarding explosive projectiles weighing less than 400 grams, The Hague Declaration (1899): Regarding bullets that expand or flatten in the human body, The Hague Regulations (1907): Regarding poison and poisoned weapons, The Geneva Protocol (1925), and The Convention on the prohibition of chemical weapons (1993): Regarding chemical weapons, The Geneva Protocol (1925), and The Convention on the prohibition of biological weapons (1972): Regarding biological weapons, Protocol I (1980) to the Convention on Certain Conventional Weapons: Regarding weapons that injure by fragments which, in the human body, escape detection by X-rays, Protocol III (1980) to the Convention on Certain Conventional Weapons: Regarding incendiary weapons, Protocol IV (1995) to the Convention on Certain Conventional Weapons: Regarding blinding laser weapons, Protocol II, as amended (1996), to the Convention on Certain Conventional Weapons: Regarding mines, booby traps and "other devices", Convention on the Prohibition of Anti-Personnel Mines (Ottawa Treaty) (1997) (hereinafter the Ottawa Convention): Regarding anti-personnel mines, Protocol V (2003) to the Convention on Certain Conventional Weapons: Regarding explosive Remnants of War, and, The Convention on Cluster Munitions (2008): Regarding Cluster Munitions. See e.g., ICRC < https://www.icrc.org/en/document/weapons> accessed 1 April 2020.
[139] Generally, Boothby, *ibid*, n.122.

> injurious effect of the weapon need not result from physical impact, as the offensive capability need not be kinetic.'[140]

When considered alongside the debate regarding AWS, Boothby's definition is especially useful because a number of pertinent concepts can be identified within it. The first is that *all* weapons have at least the ability to be used in an *offensive* manner. And the second, is that a weapon should be classified as such, regardless of whether they apply a kinetic force, or a non-kinetic force.[141] These two elements are central to the ongoing discussion, not least because opponents of AWS often only call for the prohibition of *offensive lethal autonomous weapons systems*.[142] Because *any* weapon can be used offensively (including those designed to be used defensively), and, because weapons do not necessarily have to apply aa lethal force, a comprehensive definition of AWS should account for that.[143] As a result, in light of definition, the following adjustments are made to the working definition:

An autonomous weapon is an AI or EAI, that has some degree of flexibility as to how it applies an offensive or defensive capability against a military object or combatant, while remaining free from human coercion, but not necessarily free from human supervision. The force applied may be either lethal or non-lethal in manner.

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[140] Boothby, *ibid,* n.122, 176. Also see generally, Chapter Five.

[141] Boothby uses the term 'kinetic' and implies the secondary term non-kinetic. Instead of non-kinetic, the U.S. Navy, for example, utilises to the term 'non-lethal', and similarly imply the secondary term lethal. See, §1.6.1 (5)(c) Department of the Navy Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System (SECNAVINST 5000.2E 1 September 2011) < https://www.mccdc.marines.mil/Portals/172/Docs/MCCDC/UNS/5000.2E.pdf> accessed 7 July 2021.

[142] See e.g., FLI, *ibid,* n.7. And for a useful discussion in this regard see generally, Nicholas W Mull, 'The Roboticization of Warfare with Lethal Autonomous Weapon Systems (LAWS): Mandate of Humanity or Threat to It' (2018) 40 Hous J Int'l L 461.

[143] Each of the terms non-kinetic and non-lethal can be utilised to support the notion that an electro-magnetic pulse weapon (EMP) is still a weapon. Here, regardless of the fact that an EMP is capable of obliterating an electronic signal, it can do so while causing little, or even no actual physical damage either to an individual, or to any physical property that is located in proximity to the application of 'force'. Here, the non-kinetic force is also non-lethal. This is not the case in all instances. For example, as noted in the Michael N. Schmitt (ed) *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations,* (Cambridge 2017). Rule 92 identifies that a cyber-attack can at least potentially cause sufficient physical destruction that it could be considered an 'armed attack' under art. 51 Charter of the United Nations (1945) 892 UNTS XVI 119 (hereinafter UN Charter).

1.1.4 Third Key Components of Autonomous Weapons Systems: Weapons Systems.

In order to complete the tripartite analysis, and the construction of the general definition, the following section considers the third and final element of AWS - weapons systems. This category is much wider than that of weapons previously examined. And this can be demonstrated by considering the AGM-114 Hellfire missile. The Hellfire is a solid example of a weapon that is encapsulated by Boothby's definition. It,

> 'can be used as an air-to-air or an air-to-ground missile. The Air-to-Ground (AGM)-114 provides precision striking power against tanks, structures, bunkers and helicopters. The Hellfire missile is capable of defeating any known tank in the world today. It can be guided to the target either from inside the aircraft or by lasers outside the aircraft.'[144]

Figure 2: A 'Predator Drone' armed with Hellfire Missiles.

There is no doubt that the Hellfire Missile has destructive, damaging, and/ or injurious capabilities. However, if the Predator drone is removed from the image above, the

[144] Fact File, AGM-114B/K/M Hellfire Missile [Fact-file] (America's Navy) https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2168362/agm-114bkm-hellfire-missile/ accessed 7 July 2021.

Hellfire very quickly becomes a largely ineffective mechanism for applying force. Instead, in order for its destructive capabilities to be recognised, the Hellfire requires a sufficiently capable platform. It is the *weapons system,* that gives effect to an offensive capability. However, as an independent concept, it can be a little opaque to define. The DoD defines a weapons system broadly, [145] stating that it is a,

> 'combination of one or more weapons, with all related equipment, materials, services, personnel, and means of delivery and deployment (if applicable) required for self-sufficiency'.[146]

According to the DoD, therefore, the weapons system that is responsible for firing a Hellfire Missile from a platform such as a Predator, should, as a minimum, include, the weapons platform (the Predator), the munition (the Hellfire Missile(s)), the remotely located human operative (pilot), (in addition to supporting personnel such as intelligence agents and commanding officers present), the software, and radar systems used for remote piloting and target identification (in addition to the Hellfire's a precision-guidance systems), and, the crew responsible for arming, refueling and transporting the Predator to the airfield prior to launch. All of these personnel, and indeed systems, are undoubtably central to the Hellfire's capability to apply force. Thus, the present author does not deny that this 'wide' definition of a weapons systems has some merit. To include all of these elements in the working definition of AWS, however, would have an adverse effect upon the current task of attempting to clarify what an AWS is.

In contrast, an alternative *narrow* definition of a weapons system, was originally developed by John Boyd, a U.S. Air Force Colonel and military strategist. [147] Boyd identified the OODA loop, which represents the four elements that are present in any decision to apply force.[148] These are Observation, Orientation, Decision, and Action—often referred to these as the 'think-act paradigm'.[149] This is particularly useful or the

[145] Noting the broad nature see, Scharre, *ibid*, n.20, at 367.
[146] Weapon System (JP3-0), DOD Dictionary of Military and Associated Terms (U.S. Department of Defense (DoD), January 2020), 230.
[147] John Boyd, *A discourse on winning and losing* (Air University Press, 2018).
[148] *Ibid.*
[149] Thompson Chengeta, 'Defining the Emerging Notion of Meaningful Human Control in Weapon Systems' (2017) 49 NYU J INT'L L & POL 833, 851.

sake of the current investigation, because every weapons system should consist of the components that are needed in order to complete it.[150] The OODA loop can be represented as follows,

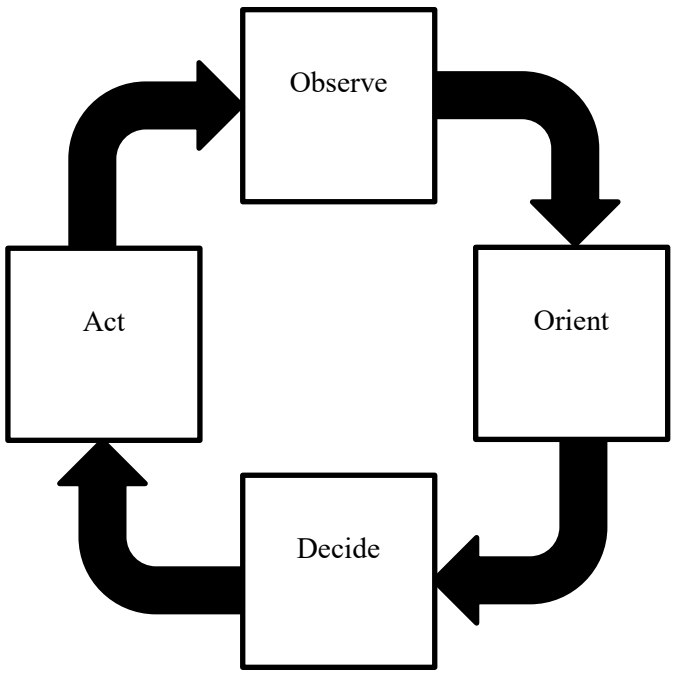

Figure 3: A Graphical Representation of John Boyd's OODA Loop.

As with Predator/ Hellfire combination, the individual steps of the OODA loop can occur in different locations and across 'multiple physical platforms'.[151] The goal of the combatant is to master their own OODA loop, which has the positive side-effect of disrupting their enemies. Doing so provides the former with an advantage and will ultimately lead to them winning a contest.

The four stages can be summarized as follows, *Observe*: Utilise all available resources (from senses such as sight, and sound, to more advanced systems such as Radar), electronic navigational aids and communications equipment), to ensure the enemy is observed, before the enemy observes you, *Orientation* is often referred to as situational awareness. In this regard it is important to know, better than your enemy, where you

[150] Scharre, *ibid,* n.20, 43.
[151] *Ibid*. Also see e.g., Schmitt and Thurnher, *ibid,* n38, 238, Crootof, *ibid*, n.5, 1846, Kenneth Anderson Matthew C. Waxman, 'Law and Ethics for Autonomous Weapons Systems: Why a Ban Won't Work and How the Laws of War Can' (2011) American University Washington College of Law Research Paper No. 2013-11, 4-5 and n.15-16, Chengeta (2017), *ibid*, n.149, 851.

are relative to your goal or goals (which in air-to-air combat, for example, is eliminating the threat).[152]

The third element requires an individual to analyze the information/ intelligence they have at their disposal (i.e., that gained from steps 1 and 2), and from it, *decide* the most appropriate course of to gain an advantage, or to win. Finally, one must *act* upon that decision, in order to test their hypothesis. The final stage requires an execution of the 'decision'. This is a continuous process, meaning that once a decision has been acted upon, the loop must start over. And the process continues until one party wins the contest (implying, of course, that the opponent must lose).

Of course, if tainted information is gathered at the first stage, then the rest of the loop is affected. [153] Moreover, on a fast-paced battlefield, an individual may quickly lose their advantage. Boyd intended for the loop to be used by fighter pilots to improve their decision making relating to enemy targeting in aerial battles. [154] Nevertheless, due to its success it was soon utilised across all branches of the U.S. armed forces, whether air, sea, or land. [155]

Humans have, thus far, remained in this loop because of the need to monitor and verify decisions made by machines.[156] Nevertheless, as technology improves, and machines become more independent, the OODA loop provides the perfect vehicle for supplying the 'tasks' that an AWS will need to carry out for it to be considered autonomous.[157] The general definition can be altered to reflect this, and because this is the third of three analysis, this is also the last adjustment that is necessary. When the three analyses are considered holistically, they can be presented thus,

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[152] Boyd identifies that Orientation is not a concept that can be applied just once. Instead, it should be seen a constant state. See generally, Boyd, *ibid*, n.147.
[153] Chengeta (2017), *ibid,* n.149, 852.
[154] The law of targeting is to be found within the law that governs armed conflict, International Humanitarian Law. Therefore, a comprehensive analysis on the subject is provided in the following chapter.
[155] In fact, (like the work of other military strategists) the OODA loop now appears in various domains, particularly in sport and business. See e.g., Graham Ruddick, 'The art of war, dogfighting and business management' (*Linkedin*, 2 April 2020) < https://www.linkedin.com/pulse/art-war-dogfighting-business-management-graham-ruddick/> accessed 7 July 2021.
[156] See, Christopher M Ford, 'Autonomous Weapons and International Law' (2017) 69 S C L Rev 413, 425-427. Here the author provides a useful discussion and graphical representation of how weapons with varying degrees of autonomy complete the four stages of the OODA loop. Note that Ford supports the argument that AWS do not exist.
[157] Chengeta (2017) *ibid,* n.149, 852-853.

An AWS is an AI or EAI, or a combination of such systems, that is designed to apply a lethal or non-lethal force to military personnel and/or military objects. Following its activation, an AWS must have some degree of flexibility as to how it completes the four tasks assigned by the OODA loop, while remaining free from human coercion - though not necessarily from human supervision.

1.1.5 Constructing a General Definition for Autonomous Weapons Systems: In sum.

The researcher intended Part I to demonstrate the lack of a universally accepted definition of AWS, and the implications of not having one to refer to. The analysis provided the reasons as to why this lacuna should be addressed, and why the researcher chose to develop their own *general definition*, as opposed to utilising an existing elucidation. To do this, the term AWS was deconstructed into its three constituent parts. In each case, the three components were assigned a definition that was considered the most suitable for the overall task of defining AWS. As each of these independent analyses were conducted, an additional layer of clarity could be added to the working general definition. And the final, resulting interpretation is presented in the previous paragraph. Somewhat significantly, this definition identifies that AWS already exist, and at this stage, the definition provided does not make a distinction between lethal and non-lethal AWS, and/ or defensive and offensive AWS.

PART 2: Alternative Definitions of Autonomous Weapons Systems.

Introduction.

In lieu of a universally accepted definition, Part 1 examined the relevant literature, and from it, constructed the authors 'general definition'. The following section continues the literature review, but with a slightly different purpose. Part 2 looks to identify alternative general definitions of AWS, in order to identify similarities, and/ or the points of departure from that offered in Part 1. It should be noted that the primary purpose of Part 2 is not to conduct an intricate compare-and-contrast exercise in order to demonstrate any comparative strengths and/ or weaknesses. But instead, to demonstrate how, and why, existing general definitions fail.

1.2.2 Alternative definitions of AWS.

Of the definitions that have been offered up by various experts (and organisations), it DoDD 3000.09 is most widely cited, and most influential.[158] It provides the following: an AWS is a 'weapon system that, once activated, can select and engage targets without further intervention by a human operator.'[159] Drawing the reader's attention back to the discussion in part 1 regarding supervision, DoDD 3000.09 continues,

> '[t]his includes human-supervised autonomous weapon systems that are designed to allow human operators to override operation of the weapon system but can select and engage targets without further human input after activation.'[160]

DODD 3000.09 is clearly in line with the present author's position. Though the DoD *do* distinguish fully autonomous from semi-autonomous weapons systems - stating the latter is a weapon's system that, 'once activated, is intended to only engage individual targets or specific target groups that have been selected by a human operator'.[161] The directive also states that such weapons 'employ autonomy for engagement-related functions' which may include,

> 'acquiring, tracking, and identifying potential targets, cueing potential targets to human operators, prioritizing selected targets, timing of when to fire, or providing terminal guidance to home in on selected targets, provided that human control is retained over the decision to select individual targets and specific target groups for engagement.,

It then goes on to identify that semi-autonomous can weapons include,

> '"[f]ire and forget" or lock-on-after-launch homing munitions that rely on TTPs… [Tactics, Techniques and

[158] *Ibid,* n.79.
[159] *Ibid*, 13.
[160] *Ibid,* n.79, 13-14.
[161] *Ibid,* n.79, 14. Also see e.g., Horowitz*, ibid,* n.12, 86.

> Procedures][162]… to maximize the probability that the only targets within the seeker's acquisition basket when the seeker activates are those individual targets or specific target groups that have been selected by a human operator'.[163]

According to this definition, a weapon such as Lockheed Martin/ Raytheon's Javelin, is not an autonomous weapon.[164] The author agrees with this distinction, because, although the Javelin can automatically guide itself to a target and can also independently determine weak points in a targets armor, a human must initially place a cursor over the intended target.[165]

Figure 4: The Lockheed Martin/ Raytheon Javelin FGM-148F

This latter distinction is also supported by Scharre, who believes that the Javelin is a type of homing munition which falls short of the level of autonomy that would be needed for a weapon to be recognised as fully autonomous.[166] With regard to levels of

[162] See e.g., 'Tactics, Techniques and Procedures', DOD Dictionary, *ibid,* n.146, and, 'Tactics, Techniques and Procedures' U.K. Ministry of Defence (MoD) Acronyms and Abbreviations < https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/227048/acronyms_and_abbreviations_dec08.pdf> accessed 31 March 2020.
[163] DoDD 30009.09, *ibid*, n.79.
[164] Javelin Weapon System (Lockheed Martin) https://www.lockheedmartin.com/en-us/products/javelin.html accessed 7 July 2021.
[165] *Ibid*.
[166] See e.g., Scharre, *ibid,* n.20, 42.

autonomy however, the similarities between Scharre and DoDD 300.09, end there. Indeed, the DoD only applies the terms semi-autonomous and autonomous. In other words, DoDD 3000.09 does not recognise *supervised-autonomy,* otherwise referred to as human-on-the-loop weapons systems,[167] as an additional and/ or distinct category of weapon. [168] As a result, in much the same way as the present author, the DoD definition appears to encompass existing weapons such as the Phalanx.[169]

A second definition that is considered, is that offered by the International Committee of the Red Cross (ICRC). The ICRC is, of course an institution that works tirelessly in all areas associated with armed-conflict, and whose commentary/ reporting is invaluable, and extremely influential throughout academia and beyond. As previously noted, the ICRCs definition is the one that has been adopted by the GGE. [170] As a reminder, this states that an AWS is,

> '[a]ny weapon system with autonomy in its critical functions. That is, a weapon system that can select (i.e., search for or detect, identify, track, select) and attack (i.e., use force against, neutralize, damage or destroy) targets without human intervention.'[171]

This definition is similar to that offered by the thesis, due to the fact that the critical functions identified by the ICRC, are, in effect, the four stages of the OODA loop.[172] The ICRC are keen to highlight that their definition is intended to be broad, and that they identify that weapons such as the Phalanx are, indeed, autonomous.[173] Indeed, the ICRC note that although some may prefer to utilise a 'narrow' definition, the core legal and ethical questions remain the same.[174] In other words, a weapon's level of technical

[167] HRW 2012, *ibid,* n. 15, 2.
[168] Scharre, *ibid,* n.20, 28-31.
[169] This point is made, for example, by Horowitz, *ibid*, n.12, 89. See also, Crootof, *ibid,* n.5, 1858-1860.
[170] *Ibid,* n.3.
[171] *Ibid*.
[172] As a reminder the four stages of the OODA loop (which is the cycle utilised by the present author) are, Observe, Orient, Decide, Act. These are not, however, dissimilar from, search for/ detect, identify, track, select and attack, as offered by the ICRC.
[173] ICRC, *ibid,* n.3, 1. Here the report states '[t]he advantage of this broad definition, which encompasses some existing weapon systems, is that it enables real-world consideration of weapons technology to assess what may make certain existing weapon systems acceptable – legally and ethically – and which emerging technology developments may raise concerns under international humanitarian law (IHL) and under the principles of humanity and the dictates of the public conscience.
[174] *Ibid,* n.3.

sophistication is somewhat irrelevant. Instead, it is the question of whether that a machine is capable in acting autonomously that is key.

Providing what she refers to as a 'clarified definition' of AWS,[175] Rebecca Crootof provides that an AWS is,

> 'a weapons system that, based on conclusions derived from gathered information and preprogrammed constraints, is capable of independently selecting and engaging targets.'[176]

Crootof continues by stating state that a wide interpretation *is* the most appropriate way of defining AWS,[177] and, provides a detailed analysis of the construction process behind her definition. In supporting a wide definition, Crootof, in the same way as the present author ,argues that the Phalanx and C-Ram are autonomous systems.[178] However, she also places a good deal of weight upon the processing ability of the machine,[179] which the current chapter has already demonstrated should not be a prerequisite of autonomy.

Seeming to endorse the DoD's definition, (former) UN Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns provides that '[t]he important element is that the robot has an autonomous "choice" regarding selection of a target and the use of lethal force.'[180] Again, this can be seen as reflective of the general definition which states that *an* AWS must have a degree of flexibility as to how it completes the four tasks assigned by the OODA loop.

Prima facie, Heyns also appears to support the need to identify weapons such as the Phalanx as autonomous. He states, for example, that because some systems can make decisions much faster than their human supervisors, they are 'effectively' AWS.[181]

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[175] Crootof, *ibid* n.5, 1854.
[176] *Ibid*.
[177] Generally, Crootof, *ibid,* n.5
[178] Generally, Crootof, *ibid,* n.5, but in particular, 1864-65.
[179] Generally, Crootof, *ibid,* n.5, but in particular, 1855-56.
[180] See, United Nations General Assembly, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns. (*United Nations General Assembly,* April 2013), para. 38 https://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf accessed 2 August 2018.
[181] *Ibid*, para. 41. Noting that Heyns uses the term Lethal Autonomous Weapons Systems (LAWS), instead of AWS.

However, in contrast to the present author, he supports the third categorization of supervised autonomy.[182] As a result, while he identifies weapons such as the Phalanx can operate with varying degrees of lethality and autonomy, he argues that 'robots with full lethal autonomy have not yet been deployed'.[183]

This is a position that is supported by the majority of commentators, including, for example, the Future of Life Institute (FLI). The FLI state that it has the objective of supporting 'research and initiatives for safeguarding life and developing optimistic visions of the future'. [184] It does so because it believes AI will become either 'the best thing ever to happen to humanity, or the worst'.[185] According to FLI, AWS very much fall into the latter category.[186] Once again, FLI appear to support the DoD definition. They state, for example, that AWS can 'select and engage targets without human intervention'.[187] However, in their various open letters which seek the introduction of a prohibition prohibitive, they employ terms such as 'threaten to become' and 'once developed'.[188]

Citing Krishnan,[189] Human Rights Watch suggest that '[f]ully autonomous weapons operate, by definition, free of human supervision and so their actions are not dependent on human controllers.'[190] Although this definition is perhaps not intended to portray absolute clarity as to the precise nature of AWS, it does reflect the general definition's recognition that the weapon must be capable of acting free from human coercion. However, it also clearly refers to non-supervised weapons. HRW are also another institution who argue that '[f]ully autonomous weapons do not yet exist, but technology is moving in their direction'.[191]

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[182] Heyns, *ibid,* n.180, para. 41.
[183] Heyns, *ibid,* n.180, para. 45.
[184] See, The Future of Life Institute (FLI) https://futureoflife.org/team/ accessed 7 July 2021. FLI counts the late Professor Stephen Hawking, Elon Musk, founder of Tesla and SpaceX, and the actor, director and, science communicator Morgan Freeman as past and present members of its scientific advisory board.
[185] See, https://futureoflife.org/ai-news/ accessed 19 March 2020.
[186] See, FLI, *ibid*, n.7.
[187] *Ibid*.
[188] *Ibid.*
[189] Krishnan, *ibid,* n.33, 43.
[190] HRW (2012), *ibid*, n.15, 44.
[191] See e.g., Human Rights Watch and International Human Rights Clinic, *Mind the Gap, The Lack of Accountability for Killer Robots* (April 2015), 6 (hereinafter HRW (2015)).

With a particular emphasis upon the need to provide a more considered definition, the U.S. strategic think-tank, The Center for New American Studies (CNAS) suggests that an AWS is 'a weapon system that, once activated, is intended to select and engage targets where a human has not decided those specific targets are to be engaged'.[192] According to this definition AWS are a step forward on from supervised autonomous systems, and thus, from weapons such as the Phalanx. The reader may wish to note that this report was co-authored by Scharre, so perhaps it should come as no surprise if it was reflective of his personal commentary.

A further definition is provided by the coalition of NGO's, known collectively as the Campaign to Stop Killer Robots. They describe their sole purpose is 'working to ban fully autonomous weapons and thereby retain meaningful human control over the use of force'. In their literature the campaign uses terminology such as AWS will decide 'who lives and dies, without further human intervention'.[193] Though this chapter has demonstrated this is true of existing systems such as the Phalanx and C-Ram, the campaign consistently refers to AWS in the future tense,[194] stating specifically that '[k]iller robots do most likely not yet exist'.[195]

Arguably, all the definitions considered above, do identify the Phalanx as an AWS (at least when operating in automatic mode). However, in contrast, the majority of commentators still believe that AWS do not yet exist. [196] Schmitt and Thurnher, for example, note that while it is true that CIWS (Phalanx) do have a degree of autonomy, they must nevertheless be distinguished from the types of weapons that HRW *et al* are petitioning against.[197] In other words, according to most, AWS are something different from today's technology, and represent something more advanced.

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[192] Scharre/ Horowitz, *ibid*, n.115, 15-16.
[193] See e.g., Campaign to Stop Killer Robots, <https://www.stopkillerrobots.org/learn/> accessed 24 March 2020.
[194] For example, the Campaign to Stop Killer Robots state '[f]ully autonomous weapons would decide who lives and who dies, without human intervention…[f]ully autonomous weapons would make tragic mistakes with unanticipated consequences that could inflame tensions…[and]… [f]ully autonomous weapons would lack the human judgment necessary to evaluate the proportionality of an attack. https://www.stopkillerrobots.org/learn/ accessed 11 May 2020.
[195] See, https://www.stopkillerrobots.org/learn/ accessed 11 May 2020.
[196] Generally, Michael C. Horowitz, 'The Ethics & Morality of Robotic Warfare: Assessing the Debate over Autonomous Weapons' (2016) 145 4 Daedalus, the Journal of the American Academy of Arts & Sciences, 25 (hereinafter Horowitz (2016/2)), Amos N Guiora, 'Accountability and Decision Making in Autonomous Warfare: Who Is Responsible?' (2017) Utah L. Rev. 393, 394, Scharre and Horowitz, *ibid,* n.115, 4, Schmitt and Thurnher, *ibid,* n.38, 235-237.
[197]Schmitt and Thurnher*, ibid*.

In the United Kingdom, the Ministry of Defence (MoD) define an AWS as a system that,

> 'is capable of understanding higher level intent and direction. From this understanding and its perception of its environment, such a system is able to take appropriate action to bring about a desired state. It is capable of deciding a course of action, from a number of alternatives, without depending on human oversight and control, although these may still be present.'[198]

Initially, this appears to be a useful attempt at defining AWS according to a number of criteria, including *intent* and *perception*. It also appears to sit comfortably alongside the thesis' general definition regarding the matter of human supervision. Nevertheless, the document continues on to identify the UK's stance on AWS, stating that they must, 'be capable of achieving the same level of situational understanding as human'.[199] The MoD note that this level of technology has not yet been achieved, and also that no MoD unmanned aerial platforms that either exists or are in development, can correctly be defined as autonomous.[200]

With that in mind, and seemingly in contrast to protestations offered by opponents of AWS,[201] the MoD reiterates a statement that first given to the informal meeting of experts in Geneva, April 2015, stating that the U.K.,

> 'does not possess armed autonomous…systems and it has no intention to develop them. The UK Government's

[198] See, (Originally para. 205), U.K. Ministry of Defence, 'Joint Doctrine Note 2/11: The UK Approach to Unmanned Aircraft Systems' (March 2011), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/644084/20110505-JDN_2-11_UAS_archived-U.pdf accessed 7 July 2021. Noting that this now been archived and replaced by UK Ministry of Defense, 'Joint Doctrine Publication 0-30.2: Unmanned Aircraft Systems' (August 2017), available at < https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673940/doctrine_uk_uas_jdp_0_30_2.pdf> accessed 24 March 2020. This latter publication utilises the exact same definition. See, (JDP 0-30).

[199] Joint Doctrine Note 2/11, *ibid,* para. 206 (b). The statement is also reiterated in Chapter Four, para. 4 of the more recent Joint Doctrine Publication 0-30.2.

[200] *Ibid*.

[201] See e.g., The campaign to stop the killer robots*, ibid,* n.193. They claim, 'the UK are developing weapons systems with significant autonomy in the critical functions of selecting and attacking targets. If left unchecked the world could enter a destabilizing robotic arms race'.

> policy is clear that the operation of UK weapons will always be under human control as an absolute guarantee of human oversight, authority and accountability. Whilst weapon systems may operate in automatic modes there is always a person involved in setting appropriate parameters.'[202]

There can be no doubt, therefore, that the MoD definition supports the prevailing school of thought that AWS are beyond the conceptual and technological boundaries of existing weapons such as the Phalanx.

Some, such as Horowitz, argue that drawing such a theoretical line in the sand can help to highlight the unique nature of AWS. [203] And, in an argument that is entirely supported by the present author, Crootof however identifies that the U.K.'s position 'exemplifies the problems inherent in setting the bar for weapons systems' autonomy too high.'[204] The problem (as highlighted by Crootof) is that according to the MoD's position, anything *other* than human-level situational awareness falls short of autonomy.[205] As a consequence, any policy, whether it be a prohibitive treaty, or a regulatory framework, would be based almost entirely upon hypotheticals.[206]

If such a definition were to be utilised, it would make the task of regulating AWS all the more difficult. It would create an entire class of weapons system which, although potentially employing increasingly high levels of autonomous tech, would still fall short of being classified as AWS. This is worrying, not least because replicating human levels of situational awareness is more akin to Artificial General Intelligence (AGI) than it is narrow AI. And it is questionable whether such advances in AI will ever be possible.

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[202] Joint Doctrine Publication 0-30.2, *ibid,* n.198, Chapter Four, para. 18.
[203] Horowitz (2016), n.12, 89-90.
[204] Crootof, *ibid*, n.5, 1853.
[205] *Ibid.*
[206] Crootof, *ibid*, n.5, n.86. Here she identifies, for example, that commenters such as Anderson and Waxman, *ibid,* n.151, 2 and 27, refer to the inevitability of AWS. As previously noted however, Crootof, believes AWS already exist.

In order to demonstrate, one need only consider the example of an autonomous 'hunter-killer drone'.[207] It is plausible, that at some point in the future, a UAV could be adorned with solar energy harnessing technology, allowing for it to deployed anywhere in the world, and for relatively long periods of time – free from further human coercion.[208] Military UAVs are already fitted with high-definition cameras that allow for them to carry surveillance at a height. And, this future system could be fitted with an advanced facial recognition system, allowing for it to search for an individual, or even individuals. Such individuals could be located, targeted, engaged, assassinated, based simply upon a characteristic – male, 16-40 years of age, of a particular ethnicity, or according to other distinctive features. [209]

While the hunter-killer drone presumably does not yet exist, the individual components that are needed in order to produce such a weapon do.[210] No doubt, when it is compared to tech five decades from now, these existing systems will be considered rudimentary. Nevertheless, the hunter-killer drone is not displaying human levels of situational understanding. Instead, it is actually a collection of relatively simple technologies, which reacting to a number of pre-programmed instructions, in a way that Scharre might even call 'automated'. Yet, as identified by Michael Horowitz, a 'hunter killer drone that makes choices, itself, about who to target, within broad mission parameters,

[207] Hunter killer drones is a term that is applied to remotely piloted UAV's, the use of which has already been identified as controversial. However, see e.g., Horowitz, *ibid*, n.12, 27-29. Here the author describes an autonomous version. Such a weapon is also alluded to in Horowitz (2016), *ibid,* n.196, 93, and Scharre and Horowitz, *ibid*, n.115, 15.

[208] A Predator drone can potentially remain airborne for 40 hours, though operations typically last no longer than 20 hours, see, Roger Conner, The Predator, a Drone That Transformed Military Combat (Smithsonian National Air and Space Museum) < https://airandspace.si.edu/stories/editorial/predator-drone-transformed-military-combat> accessed 7 July 2021. However, in contrast, a solar powered aircraft has already flown for 26 days continuously, see e.g., Anmar Frangoul 'Airbus' solar-powered aircraft just flew for a record 26 days straight' (*CNBC,* 10 August 2018) https://www.cnbc.com/2018/08/09/airbus-solar-powered-aircraft-just-flew-for-26-days-straight.html accessed 7 July 2021.

[209] This is a controversial method of targeting that has previously been highlighted by arms control groups, see e.g., Victor Tangermann, 'Academics: BAN THE KILLER "SLAUGHTERBOTS" Before We all Die: It's Not Too Late (*Futurism*, 17 June 2021) https://futurism.com/the-byte/academics-ban-slaughterbots accessed 7 July 2021. Note however, that this is a form of AWS that does not yet exist. Indeed, see e.g., Paul Scharre, Why You Shouldn't Fear 'Slaughterbots' (*Center for New American Security* (CNAS), 2 December 2017) https://www.cnas.org/publications/commentary/why-you-shouldnt-fear-slaughterbots accessed 7 July 2021.

[210] See e.g., Scharre, *ibid,* n.20, 120-134. Here the author discusses how most of the components that are needed to construct a rudimentary AWS are readily available, and moreover, often free.

would clearly represent an autonomous weapon.'[211] And, with that in mind, the present author questions the sincerity of MoD's commitment *not* to build AWS.[212]

The preceding analysis has clearly demonstrated that while a limited number of contributors apply a wide definition that captures certain existing weapons as autonomous, they are generally in the minority. The majority view is that AWS will be something different from existing weapons, regardless of whether the definitions offered by them appear to encapsulate systems such as the Phalanx. There is an overriding difficulty with adopting the position that AWS are something other than existing supervised weapons systems. And, that is, that many supervised systems are capable of independently carrying out exactly the same cycle of tasks - i.e., the OODA loop - that they argue would make future weapons 'fully' autonomous. For this reason alone, the 'something other than today's weapons' hypothesis is not, and cannot, be supported by the present researcher.

1.2.3 Additional difficulties with general definitions.

The preceding section concluded with the researcher providing a base level reason for not supporting those general definitions which fail to recognise certain existing weapons as autonomous (i.e., those which are capable pf independently completing all four tasks assigned by the OODA loop). The purpose of the following section is to introduce a number of additional, wider, reasons as to why general definitions cannot be utilised to support a thorough investigation into the lawfulness of AWS. This examination starts with a reminder of problems that arise when the definitional bar is set too high. This being the issue with the MoD's definition requiring an weapons system to display human-like levels of situational awareness before it can be classified as an AWS.

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[211] Horowitz, *ibid,* n.12, 93.

[212] See, Crootof, *ibid,* n.5, 1853. The point here is that the MoD are implying that it is currently not their intention to develop or introduce weapons with human levels of situational awareness (which may or may not be technically possible in the future), and anything short of that would merely be considered an automated weapon as opposed to autonomous. See also, Mull, *ibid,* n.142, 477-478. For many, the British Taranis UAV (named after the Celtic god of thunder), currently in the research and development stage, is the perfect example of a precursor to fully autonomous weapons. See e.g., Taranis (BAE Systems) < https://www.baesystems.com/en/product/taranis> accessed 14 May 2020.

In contrast, the central focus of this section is that it is also significantly problematic to set the definitional bar 'too low'.[213] Principally, this is because a definition which captures too many existing weapons, would absolutely miss the novelty and uniqueness of AWS altogether.[214] The problem, the present author somewhat controversially posits, is that *all* general definitions set the bar too low. This includes that which is offered by the present author in Part 1 of this chapter.

The first problem with general definitions is that the number of weapons systems that are encapsulated by them is vast. In addition to their relative numbers, there is the additional consideration that every AWS could potentially be programmed with exceptionally varied levels of AI sophistication, and capable of completing a large verity of tasks. General definitions simply cannot account for this. Instead, on the whole, they merely distinguish between autonomous and non-autonomous systems, and even then, with varying degrees of specificity.

A substantial weakness with general definitions is that they cannot distinguish between individual weapons, and/or the use thereof. As noted in the introduction, most often, general definitions classify a smart grenade, in the very same way as a hunter-killer drone, let alone the potentially infinite number of weapons systems in between. And they do so regardless of any potential humanitarian benefits on offer. An additional reason why the majority of general definitions suffer, is that while they often identify a number of alternatives, they fail to distinguish between them. The thesis' general definition provides a useful example. It states,

An AWS is, an AI or EAI, or a combination of two or more of such systems, that is designed to apply either a lethal, or a non-lethal force to military objects and combatants….

The focus of the preceding sentence is intended to be placed upon the terms lethal and non-lethal. The inclusion of these two terms was justified in Part 1, and to avoid repetition, the is no requirement to repeat that analysis here. Nevertheless, a non-lethal application of force may, in certain circumstances, be considered lawful. Whereas in contrast, in identical circumstances, a kinetic or lethal force might be considered

[213] Crootof, *ibid,* n.5, 1851-1852.
[214] *Ibid.*

unlawful. This cannot be reflected within a general definition, only alluded to. But, in doing so the net is cast even wider than before. Exactly the same principle applies to the terms, offensive and defensive. And, while the researcher has already justified their inclusion, a general definition simply cannot distinguish for the sake of comprehensive legal analysis – in which the use of one may have very different legal implications than the other.

1.2.4 Alternative Definitions of Autonomous Weapons Systems: In sum.

Having developed a thesis general definition for AWS in the Part I, the purpose of Part 2 was to evaluate how that compared to a number of alternatives. This investigation demonstrated that while there is some support for the researcher's hypothesis that AWS already exist, that is a minority view. Instead, the majority of commentators adopt the position that AWS are weapons of the future. This is the first major difficulty of relying solely upon a general definition, in that the majority of definitions introduced in this section all appear to encapsulate a form of supervised AWS.

A further issue with general definitions however (the present authors included) is that they cannot distinguish between weapons type. Instead, they can only identify whether a particular weapon is autonomous, or not. This presents a number of difficulties to the present task of conducting a comprehensive legal analysis of AWS, because any weapon can be used in a number of ways. Somewhat vitally to the overall aims, exactly the same AWS could be deployed in two (or more) sets of circumstances, and each use could be governed by completely different legal obligations. As a result, in order for the discussion to move on, a concrete definition of AWS remains vital for both for those opposed to the introduction of AWS, and for those in support of regulating the use of AWS.[215]

[215] Crootof, *ibid,* n.5, 1845.

PART III: The Template, A Unique and Comprehensive Method for Classifying AWS.

Introduction.

In order to construct a compressive legal framework, a definition must be capable of supporting the comprehensive legal analysis that is conducted in the following chapters. The previous two sections have considered a number of general definitions, including the authors own. And, while Part 2 concluded by underscoring the inherent weaknesses of such an apparatus, the analysis in Part 1 and Part 2 did identify a number of factors which are central to the existing debate. Part 3 introduces an utterly novel way weaving these key elements into the definitional tool. In doing so it devises the *Template*, the thesis' unique system for categorizing AWS. The primary purpose of the following section is to demonstrate the unique strengths of the *Template* – not least, how its construction allows for individual AWS to be identified, and thus analysed.

1.3.2 Constructing the Template: The Levels Axis.

The *Template* is founded upon three axes. These should not necessarily be considered hierarchical, but the first one of those considered – hereinafter referred to the Level Axis – is especially useful in terms identifying particular weapons. The Level Axis is an adaptation of a discussion that that was originally posited by Michael C. Horowitz.[216] He classifies AWS according to *types* of weapons rather than to levels of AI sophistication. Though Horowitz himself identifies the need to address the definitional lacuna, his essays do not intend to resolve it.[217] Instead, he offers a function-based system for classifying AWS, [218] which does ultimately, work particularly well for present purposes.

Rather than trying to 'figure out the most precise definition' of AWS, Michael Horowitz insightfully identifies three levels weapons systems which are based upon

[216] See generally, Horowitz, *ibid*, 196. It should be noted that Horowitz does not refer directly to his classification system as a model *per se*. As is demonstrated below, the Horowitz model, including the graphical representation, are merely implied. and ultimately constructed, only as a result of his discussion. See also generally, Horowitz, *ibid,* n.12.
[217] Horowitz , *ibid,* n.196, 27. Also see, Scharre and Horowitz, *ibid,* n.115, 3-4.
[218] Horowitz, n.12, at 86. At fn. 5 he suggests, 'There are inherent limitations because definitions almost inevitably lead to discussions of cases at the margins that may fall between the cracks of a definition.'

'what different types of weapon might do.'[219] The categories are, Level 1: Munitions, Level 2: Weapons Platforms, and Level 3: Operating Systems. [220] According to Horowitz, a Level 1 AWS is likely to be the least controversial, and the least likely to raise any significant concerns in terms of current legal provisions.[221] This is because they are, or, in Horowitz's case, will be,[222] non-recoverable weapons which are launched by a human operative. And the human operative will be accountable for the mis-use of a non-autonomous munition in the very same way as they would be now.[223]

A straight-forward example of a *non-autonomous* munition is the M67 fragmentation hand grenade,[224] which for decades, has been the only lethal grenade fielded by U.S. armed forces[225] To detonate the M67, a combatant must release the safety lever, which triggers the fuse and initiates the explosive charge (after a four-to-five second delay).[226] This weapon is clearly in contrast to the (hypothetical) autonomous *smart* grenade that has been previously considered – and which can chose not to detonate based upon information gathered by the weapon itself. But as non-recoverable weapons that are designed to destroy a target or, a type of target, both are considered munitions.[227]

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[219] *Ibid*, 94.
[220] Horowitz, *ibid,* n.196, 28-29.
[221] He notes for example that, [F]or AWS munitions, existing law of war regulations likely are sufficient, potentially with little change, to ensure weapons are used in ways that comport with the law of war, see, Horowitz, *ibid,* n.12, 95.
[222] The point here is, as noted, Horowitz is very much in the AWS are weapons of the future camp.
[223] Horowitz, *ibid*, n.12, 94.
[224] M67 Fact sheet, available at http://www.pica.army.mil/pmccs/combatmunitions/grenades/lethalhand/m67frag.html> accessed 20 August 2018.
[225] See, Kyle Mizokami, 'The U.S. Army is Designing iIs First New Grenade in 40 Years' (*Popular Mechanics,* 20 September 2016) < https://www.popularmechanics.com/military/weapons/a22935/us-army-et-mp-grenade/> accessed 25 May 2020.
[226] See e.g. M67 Hand Grenade [Factsheet] (*Day & Zimmermann*), https://cdn2.hubspot.net/hubfs/208537/assets/PDF/Product%20Sheets/NewWebsite_Mun_CloseCombat_M67%20hand%20grenade.pdf accessed 7 July 2021.
[227] As noted, even in the case of munitions it is not necessarily a straightforward process to identify autonomy. See e.g., David T Laton, 'Manhatten_Project.exe: A Nuclear Option for the Digital Age' (2016) 25 Cath U J L & Tech 94, 103. Here the author considers the EXACTO self-guiding .50-caliber bullets that were unveiled by DARPA in 2015. Once fired, the EXACTO, is capable of 'correcting inaccurate aiming and movement of the target. These bullets, like laser-guided bombs and Tomahawk missiles, can steer themselves into a target.'

Figure 5: Day & Zimmermann's M67 fragmentation hand grenade.

Level 2 Autonomous Weapons *platforms* include, for example, naval vessels, and aircraft, that are capable of identifying and engaging targets independently of human supervision.[228] Horowitz suggests that currently, almost no level two weapons exist.[229] He acknowledges that the Phalanx is an example of AWS that is in use today if a wide definition is applied.[230] Though he prefers the narrow interpretation. He argues that platforms such as the Phalanx are comparatively unproblematic having been in operation for years.[231] Horowitz identifies that a weapon platform such as the autonomous hunter-killer drone, previously referred to do perhaps raise the greatest concerns. Although at least in his view, no military is currently planning to build them.[232]

An example of an existing non-autonomous weapons platform is the Eurofighter Typhoon fighter jet.[233] The Typhoon's pilot is assisted by various automatic and, in some cases autonomous technologies, However, the human remains in the OODA loop. An autonomous hunter-killer drone, on the other hand, would be an unmanned platform, that was capable of independently completing the OODA loop. A L2 autonomous weapons platform will typically launch an attack by deploying a munition.

[228] Horowitz, *ibid*, n.196, 28.
[229] *Ibid.*
[230] Horowitz, *ibid,* n.12, 91.
[231] *Ibid,* 92.
[232] *Ibid.*
[233]See, Eurofighter [Fact sheet] 'The Aircraft' (Eurofighter Typhoon) https://www.eurofighter.com/the-aircraft accessed 7 July 2021. This states, 'The Eurofighter Typhoon delivers an enviable level of flexibility and efficiency…Eurofighter Typhoon possesses both adequate weapon availability (up to 6 bombs whilst also carrying six missiles, a cannon and a targeting pod) and sufficient processing power to simultaneously support missile in-flight updates and bomb in-flight targeting'.

This may conventional, non-autonomous munition, or a munition that is classified as a L1 AWS, such as U.K's Brimstone Missile.[234]

Figure 6: A Eurofighter Typhoon, armed with a number of missiles including Brimstones.

According to Horowitz, L3 Autonomous Operating Systems (L3AWS) are perhaps the most controversial of all AWS – and potentially those that will be similar to those envisioned by Hollywood script writers.[235] As a result, they are also the most widely type of AWS that are opposed by organizations such as FLI and the International Committee on Robot Arms Control (ICRAC).[236] A level 3 AWS is a military operations planning system.[237] An AWS such as this could analyse an almost infinite number of battle strategies, choose the best, and directing other weapons systems accordingly.[238] In this instance, the AI programme is effectively replacing the human commander, and could even be responsible for issuing orders relating to the battlefield movements of human combatants. There are clearly a wide variety of tasks such an AWS could be delegated. Indeed, L3AWS are potentially the broadest category of AWS - though Horowitz argues that none are either in existence, or in development.[239]

[234] For a Brimstone Factsheet see, < https://www.mbda-systems.com/product/brimstone/> accessed 21 August 2018. Brimstone is controversial, and indeed an AWS, due to the fact that when it is operated in mode 3, which is enabled via a simple change of software, it is a fire-and-forget system that allows 'simultaneous target engagement.'
[235] Horowitz, ibid, n.12, 27.
[236] See, FLI, *ibid,* n.7.
[237] Horowitz, *ibid,* n.196, 27.
[238] *Ibid.*
[239] *Ibid.*

Figure 7: A L3AWS could effectively remove the human element from operational battle planning.

1.3.3 Operational Decision-Making and Strategic Decision-Making.

One benefit of Horowitz's classification system is that each of its three levels are designated according to long-established military terminologies.[240] As a result, many of his readers will find it straightforward to establish a familiarization with the primary elements of his essay – even if they not necessarily agree with his overall hypothesis. In order to maintain that clarity of discussion, the current researcher applies the same language where possible. There is, however, one instance where there is some divergence. This is because Horowitz suggests that level 3 AWS might ultimately be capable of deciding whether or not to enter into a new armed conflict.[241] In short, that means Horowitz's Level 3 AWS represents a homogenization of the military commander and, the Head of State.

The present researcher believes this is a mistake. This is because in the vast majority of cases, these are two very different individuals, operating under quite distinct

[240] Horowitz, *ibid*, n.12, 94. This is the primary reason Horowitz decides to classify AWS this way is because 'Military technologies that are part of the kill chain in war generally fall into one of…[these]…three categories'.
[241] Horowitz, *ibid*, n.196, 27.

capacities.[242] There is no doubt that strong political leadership can underpin a successful military operation. Moreover, commanding officers must direct military operations,[243] and have effective control over their subordinates.[244] Indeed, via the concept of command responsibility - a concept that lays at the heart of the current researcher's method of accounting for AWS - commanding officers are legally responsible for the actions of their subordinates.[245]

In many instances, high-ranking officers will have an influence over strategic level decision-making. However, in the vast majority of circumstances, it is very unlikely that the decision to go to war, for example, is one which will be made by a military commander.[246] Instead, that is a decision that is very likely to be made by a head of state, and perhaps only then, with the support of their wider body of executives.[247] This is a vital distinction when carrying out an enquiry into the lawfulness of AWS, because the bodies of law that are applicable to each individual (and consequently any autonomous systems capable of replacing them) can be quite different.

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[242] A number of military dictatorships might be identified as running counter to this argument. However, on the whole, in the democratic States party to the United Nations Charter, these are typically separate individuals.

[243] For an example of how commanding officer is defined see e.g., Ministry of Defence, The Manual Service of Law (MSL) (JSP 830) Chapter Two. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/583232/20170111-MSL-Chapter_2_Ftn_2_-_AL41.pdf accessed 7 April 2020.

[244] See e.g., Yoram Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict* (Cambridge, 3rd edn. 2016), para. 868. Here the author notes, 'Article 28(1) of the Rome Statute refers to a "person effectively acting as a military commander" and to crimes "committed by forces under his or her effective command and control".

[245] Dinstein, *ibid,* para 869. The author refers to ICRC commentary which states that 'command responsibility applies to all ranks…from the Commander-in-Chief down to the common soldier.'

[246] Horowitz, *ibid,* n.196, 28.

[247] Of course, there are various support systems in place whose opinions a head of state may need to take into account. These may include, for example, military commanders, legal representatives, civilian experts, elected and non-elected officials, and in some cases entire legislative assemblies. There may also be some legitimate examples where the Head of State is also seen as head of the military. The most obvious of these is the President of the United States. See e.g., Article II, Section II of the United States Constitution, which provides, 'The President shall be Commander in Chief of the Army and Navy of the United States, and of the Militia of the several States, when called into the actual Service of the United States', Under the Sungon, or military first, policy of North Korea, the leader of the Workers Party of Korea is also the supreme commander of the Korean People's Army, Military dictatorships, or military rule, offers further examples of where a separation of the role of head of state, and head of military, is often ambiguous. For example, following the Since the coup d'état of 22 May 2014, the Thai constitution of 2007 was revoked, placing the State under the rule of a military organization called National Council for Peace and Order (NCPO). At the time of writing, an attempt to re-write the Thai constitution had recently failed. See e.g., 'Proposal to rewrite Thailand's Military -backed constitution fails' (Reuters, 18 March 2021) https://www.reuters.com/article/us-thailand-protests-idUSKBN2BA0M2 accessed 7 July 2021.

For example, when guiding operations upon an existing battlefield a military commander is bound predominantly by international humanitarian law (IHL) (otherwise referred to as the *jus in bello*). In contrast, when weighing up the decision to enter into armed conflict, a head of state (with support) will be much more aware (at least in the first instance) of their obligations under the *jus ad bellum*. The *jus ad bellum* contains an entirely different set of legal principles to those found within IHL. And, as a result, any suitable classification system must find a way of differentiating between the two.

Throughout this body of research, the researcher identifies that there are a wide variety of strategic level decisions that could potentially be delegated to AWS. And these arise both in armed conflict, and outside of armed conflict. Consequently, the *Template* introduces a fourth level of autonomy to reflect this. In the first instance, L3 on the *Template* is intended to represent only the military command structure. L3AWS are therefore, hereinafter referred to as Command Operating Systems (COS). As previously noted, although a L3AWS may be capable of supervising various elements, including L1AWS and L2AWS, at their core, they are an algorithm that makes assessments of a live, evolving battlefields.

Level 4 systems (L4AWS), on the other hand, are hereinafter referred to as Executive Operating Systems (EOS). If they were ever developed, they would be delegated the power to make strategic decisions, such as those that are currently reserved for individuals such as the U.S. President. This may include, for example, decisions regarding nuclear launch.[248] In other words, a L4AWS would need to be capable of weighing the various legal, political, ethical, and strategic factors that might influence, for example, decision relating to the resort to force.

1.3.3.2 The Levels Axis: In sum.

Having identified the inherent difficulties with generalized definitions, Part 3 begun the task of constructing a classification system that will be used to construct a legal framework for regulating the use of AWS. Horowitz's model provided a particularly useful platform upon which to build, not least because it provides a straightforward

[248] In the vast majority of cases the U.S. president is the only individual who can provide authorisation for a nuclear launch. For a useful discussion see generally, Grimal and Pollard (2021), *ibid*, n.4.

method of classifying AWS according to widely recognised military terminology. Although useful, the present author bifurcates from Horowitz's hypothesis in terms of L3AWS capabilities. It did so by identifying the need to distinguish strategic decisions from operational ones – and, therefore, the need to provide an additional level of autonomy. The four level of autonomy identified in the preceding discussion, are presented on the following graphical representation. However, while Horowitz believes AWS do not yet exist, the *Template* should be applied to any weapon that encapsulates the author's general definition.

AUTONOMOUS WEAPONS SYSTEMS (Any weapons system that, once activated, is capable of completing the OODA loop free from human coercion).
LEVEL 4: EXECUTIVE OPERATING SYSTEMS.
LEVEL 3: COMMNAD OPERATING SYSTEMS.
LEVEL 2: WEAPONS PLATFORMS
LEVEL1: MUNITIONS.

Figure 8: The Level Axis

1.3.4 Constructing the Template: The Defence/ Offence Axis.

The previous section established the Level Axis (or the axis of autonomy). This effectively forms the *backbone* of the *Template*. Somewhat importantly, categorization on this axis is not necessarily determined at the design stage, at the weapons factory, or even at the weapons storage facility. Instead, classification is assigned at the moment at which a human operator authorises the use of a particular AWS. The remainder of Part 3 considers two additional and immensely valuable axes. Each of them is transposed from the discussion which took place in Part 1 and Part 2, *ibid.*

The first of the two further axes relate to the central matter as to whether an AWS is to be used offensively or defensively. This axis is hereinafter referred to as the O/D axis. The second additional relates to equally crucial matter of whether an AWS is intended

to apply a lethal or non-lethal force. This third axis is hereinafter referred to as the L/N axis. Although both of these components can be found in the authors general definition, that fails to provide a method for distinguishing between each extremity. The *Template* does not. Indeed, it is by utilizing these two central elements in the wider discussion regarding AWS, that the Template becomes a truly unique multi-dimensional classification tool.

In the first instance, the matter of establishing whether an AWS is designed to be used offensively, or defensively, is vitally important. This is not least, because a number of arguments in support of the prohibition, appear only to have the desire to want to ban offensive systems. A primary inclusion here, however, and one that was highlighted by Boothby in the Part 1 discussion, is that there is no such thing a purely defensive weapon. Instead, *all* weapons have the potential to apply an offensive force. Therefore, the matter of whether an AWS is offensive or defensive, will depend almost entirely upon the intentions of the individual authorizing the weapons deployment. Indeed, the single most important reason for establishing whether an AWS is acting (or is intended to act) either on either the [O] or [D] extremity, is simply that knowing so will be key to establishing the lawfulness of its use.

One problem with distinguishing offensive attacks from defensive attacks, however, is that 'attack', can means different things. For example, while Article 2(4) UN Charter prohibits the threat or use of force,[249]Article 51 of the same charter acknowledges a State's inherent right to individual or collective self-defence in response to an *armed attack* or grave threat of a use of force.[250] As a result (under the *jus ad bellum*) while the use of AWS for offensive missions appears to be inherently unlawful, certain defensive actions may be legally justifiable. In contrast, under the *jus in bello,* the second of three legal disciplines that is examined in the following chapters, attacks are defined 'acts of violence against the adversary, whether in offence or in defence.'[251]

[249] See, art. 2(4) UN Charter, *ibid,* n143.
[250] Note for example art. 51 UN Charter , *ibid,* n.143 states, 'Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations…' This is discussed in greater detail in Chapter Two (particularly in Part 2), as is the notion of 'grave' force.
[251] Art. 49 API, *ibid,* n.43.

The relevance here, is that under the *jus in bello,* both offensive attacks and defensive acts are potentially lawful actions.[252]

In order to address this, the *Template* could define an offensive attack as - a use of force directed against an enemy combatant or military object. However, that misses the point of the examination into the legal intricacies of individual AWS - doing nothing, for example, to distinguish self-defense from pre-emptive self-defence (the latter of which is largely considered to be unlawful),[253] or, hunter-killer drones from existing weapons systems such as the Phalanx.

Instead, the terms offence and defence are used refer to pro-active uses of force, and re-active used of force respectively. In other words, the *Template* considers an offensive action as one that is launched at a specific target, type of target, or a group of targets, that is not considered an *absolute* immediate threat. This might be, for example, a munitions depot. But the point is, the target is not being 'repelled'.

In contrast, the *Template* classifies a defensive action as one that is used in reaction to an immediate threat, such as an Inter-Continental Ballistic Missile (ICBM), post launch. This is what Dinstein refers to (in the *jus ad bellum* sense) as interceptive self-defence.[254] And, although some authors have previously questioned its usefulness,[255] it provides the perfect tool for distinguishing types of attack for present purposes (whether in the *ad bellum*, or the *in bello*). In short, interceptive self-defence distinguishes acts of pre-emptive self-defence, from a straight-forward acts of self-defence. This is particularly advantageous for AWS classification because it provides a method for differentiating a defensive system such as a Phalanx,[256] from Israel's

[252] IHL acknowledges that in war, adversaries will attack one and other. Therefore, prima facie, whether in offence or defence, attacks are lawful. All attacks are, however, subject to a number of caveats, including, the need to adhere the principles of distinction and proportionality. There are, for example, also a number of prohibitive weapons treaties that the belligerents parties must consider. However, many of these treaties exist due to the fact that they prohibit a weapon that cannot be used in a manner that consistent with the principles of distinction and/or proportionality. See e.g., Convention on Chemical Weapons (1993), *ibid,* n.138.

[253] This is, of course discussed in greater detail in the following chapter.

[254] Yoram Dinstein, *War, Aggression and Self-Defence* (6th Edn. CUP, 2017), 231-235.

[255] James A. Green, 'The Ratione Temporis Elements of Self-Defence' (2015) 2 J on Use Force & Int'l L 97, 107.

[256] Most of the weapons that the thesis classifies as existing AWS are used in a defensive manner. For example, as previously noted, the autonomous mode on the Phalanx and on other CIWS is only intended to be engaged when a human operator is overwhelmed by the scale of an 'attack'. See e.g., Scharre and Horowitz, *ibid,* n.115, 12. Here the authors identify that over 30 States currently employ defensive systems.

controversial Harpy Drone,[257] which is something general definitions simply cannot do.

The full benefits of this distinction will not be fully established until the individual legal analysis are conducted in the following chapters. However, the primary relevance of the distinction in respect of the current discussion, is that it gives the individual tasked with authorising the deployment of AWS a second, additional and variable, method for establishing any given weapons lawfulness – and, for each and every deployment. A graphical representation of the changes discussed in the preceding section appear as follows,

AUTONOMOUS WEAPONS SYSTEMS (See general definition, but, in short, any weapons system that once activated is capable of completing the OODA loop free from human coercion).		
DEFFENSIVE USE [D]	LEVEL /	OFFENSIVE USE [O]
EXECUTIVE OPERATING SYSTEMS	4	EXECUTIVE OPERATING SYSTEMS
COMMAND OPERATING SYSTEMS	3	COMMAND OPERATING SYSTEMS
WEAPONS PLATFORMS	2	WEAPONS PLATFORMS
MUNITIONS	1	MUNITIONS

[257] See e.g., HRW (2012), *ibid*, n.15, 13. Here HRW refer to current weapons technology as precursors to future AWS. However, they predict that future AWS will have a much greater range, and that as a result, they will be much harder to control than a CWIS. Also see, Scharre & Horowitz, *ibid,* n.115, 12, noting, for example, that in addition to Israel's 'Harpy' drone , another 'special' exception to the rule that AWS do not yet exist, is the 'Encapsulated Torpedo Mine' currently deployed by Russia and China. Although a fairly rudimentary weapons system, this can nonetheless, select and engage targets without further human intervention.

Figure 9: Classification model, Revision 2

1.3.5 Constructing the Template: The Nature of the Force Applied Axis.

Thus far, the discussion in Part 3, has identified two methods for classifying individual AWS – the levels axis, and the matter of whether the AWS is intended to be used offensively or defensively ([D]/[O] axis). The following section considers a third, and again, it is one which has previously been considered. In this instance, the additional method of classification relates to the nature of the force to be applied. In particular, it identifies whether an AWS is to apply either a lethal force, or non-lethal force. This third axis is hereinafter referred to as the [L]/[N] axis. The inclusion of this third *Template* dimension is necessary, not least, because it is remains uncertain whether opponents of AWS want to prohibit all AWS, or just certain AWS.

Somewhat significantly, the majority of opponents refer only to LAWS – machines that are capable of killing (or of causing significant damage). As identified by Boothby, however, a weapon can apply either a kinetic or non-kinetic force. Non-kinetic weapons are an ever-growing presence in the armories of contemporary armed forces. And there no reason to suspect this is a trend that will cease or decrease. For example, the U.S. Space Force (USSF), was first established as an independent service on the 20th December 2019.[258] As a newly recognised, independent, DoD organization,[259] the USSF state their 'responsibilities include developing military space professionals, acquiring military space systems, maturing the military doctrine for space power, and organizing space forces to present to our Combatant Commands'.[260] It does so in order to 'maintain and enhance the competitive edge of the DOD in space while adapting to new strategic challenges'.[261]

With one eye, no doubt, upon the fact that all armed forces have a growing reliance upon advanced methods of communication, the USSF recently announced its first weapon. It came in the form of the Counter Communications System Block 10.2, (CCS), which is set to be deployed and used to prevent the U.S. adversaries from

[258] A U.S. 'Space Force' has existed since September 1982, though previously it was a branch of the U.S. Airforce. A Space Force fact sheet is available at: < https://www.spaceforce.mil/About-Us/Fact-Sheet> accessed 9 April 2020.
[259] In addition to the U.S. Army, The U.S. Navy and the U.S. Air Force.
[260] USSF fact sheet, *ibid,* n.258, para. 2.
[261] USSF fact sheet, *ibid,* n.258, para. 6.

accessing their own military communications satellites.[262] Essentially, rather than physically destroying enemy satellites (causing space debris and risking damage to 'friendly' satellites), the CCS sends out an electronic signal which jams the lines of communication that enemy forces rely upon.[263]

The CCS's novelty, and its relevance to the current discussion, is not only that it utilises a non-kinetic force, but that its effects are reversable.[264] The point here, is that non-kinetic directly relates to non-lethal. And a non-lethal AWS of this type could also be developed and used to cause no physical lasting harm to any number of objects, not just those positioned in space. If this was the case, then many factors need to be considered, not least the matter of whether an 'attack' with a non-lethal AWS would qualify as an 'armed attack' as per Article 51 of the UN Charter.

The matter of lethality is also relevant to the wider discussion regarding autonomous cyber weapons. For example, The *Template* and general definition identify that AI or cyber systems *can* be classified as AWS.[265] However, that is a different stance to that adopted by U.S. DOD 3000.09, which differentiates cyber weapons from tangible

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[262] Kyle Mizokami, 'U.S. Space Force's First Offensive Weapon Is a Satellite Jammer', (*Popular Mechanics,* 17 March 2020) < https://www.popularmechanics.com/military/a31703515/space-force-first-weapon/> accessed 7 April 2020. Also see, Tom Dunlop, 'US Space Force shows off first offensive weapons system' (*U.K. Defence Journal* (UKDJ)16 March 2020) < https://ukdefencejournal.org.uk/us-space-force-debuts-first-offensive-weapons-system/> accessed 7 April 2020, and, Joseph Trevithick 'Space Force Just Received Its First New Offensive Weapon' (*The War Zone*, 13 March 2020) < https://www.thedrive.com/the-war-zone/32570/space-force-just-received-its-first-new-offensive-weapon> accessed 9 April 2020.

[263] By applying a non-kinetic force, the CCS differs from the 'killer satellites' that are reportedly being developed by Russia. See e.g., Joseph Trevithick, 'A Russian "Inspector" Spacecraft Now Appears to be Shadowing An American Spy Satellite' (*The War Zone*, 30 March 2020) https://www.thedrive.com/the-war-zone/32031/a-russian-inspector-spacecraft-now-appears-to-be-shadowing-an-american-spy-satellite accessed 9 April 2020. Note there is also the possibly of ground based kinetic anti-satellite systems. See e.g., Joseph Trevithick, 'Let's Talk About That Mysterious Chinese Anti-Ballistic Missile Launch' (*The War Zone*, 6 February 2018), < https://www.thedrive.com/the-war-zone/18283/lets-talk-about-that-mysterious-chinese-anti-ballistic-missile-launch> accessed 9 April 2020, and, Zachary Keck, 'How China Could Win a War Against America: Kill The Satellites' (*The National Interest*, 3 October 2019) < https://nationalinterest.org/blog/buzz/how-china-could-win-war-against-america-kill-satellites-85176> accessed 9 April 2020.

[264] Trevithick (2108), *ibid,* n.263, notes, The Air Force has described the effects as "reversible" in the past, meaning that when the jammer shuts off, the target satellite would go back to functioning are normal.

[265] See, *ibid,* n.143. Also see, John Yoo, 'Embracing the Machines: Rationalist War and New Weapons Technologies' [2017] 105 Cal. L. Rev. 443, 444. Here the author identifies that in 2008 Russia was the first known State to deploy a cyber-weapon in conflict, doing so to limit the effectiveness of Ukrainian Defences during the operation to annex the Crimean Peninsula. He also discusses the Stuxnet Virus, allegedly deployed by the United States and Israel in order to delay the Iranian nuclear program.

ones.[266] However, in short, the mater of lethality is simply too central an element in the existing debate to simply be discounted. It is not inconceivable that future AWS will have the ability to apply lethal and/ or non-lethal force, once again, both on live battlefields, and away from them.

As a result, the *Template* must be capable of identifying each potential use. By utilizing the lethal and non-lethal distinction as a third method of classification, the *Template* provides yet another method for drawing in, and of overcoming the primary problem with general definitions – i.e., that they are too vague and imprecise to support the comprehensive legal analysis that is undertaken in the following chapters. Indeed, it is only by utilizing these three independent, but inter-related axes, that such an appraisal can be conducted.

1.3.6 The Template.

Having first identified the backbone to the *Template*, Part 3 considered two further axes. When considered together, these three axes provide an utterly unique, but fit-for-purpose, future-proof, method of qualifying the lawfulness of individual AWS. The *Template* is best viewed as a three-dimensional model. However, the final incarnation of the classification system can also be represented as follows,

L	L4	N	D	L4	O	N	L4	L	O	L4	D
L	L3	N	D	L3	O	N	L3	L	O	L3	D
L	L2	N	D	L2	O	N	L2	L	O	L2	D
L	L1	N	D	L1	O	N	L1	L	O	L1	D

Figure 10: The Template.

[266] Duncan B. Hollis, 'Setting the Stage: Autonomous Legal Reasoning in International Humanitarian Law', (2016) 30 Temp. Int'l & Comp. L.J. 1, 7.

D = Defensive/ Re-active use of force L = Lethal application of force	O = Offensive/ Pro-active use of force N = Non-Lethal application of force
L4 Executive Operating System	Capable of making the political decision of whether or not to enter into a fresh armed conflict
L3 Command Operating System	Capable of strategic battle planning and of directing other systems (including humans)
L2 Weapons Platforms (Recoverable)	Capable of selecting and firing munitions upon targets of its own accord
L1 Munitions (Single Use)	A non-recoverable weapon that is designed to destroy a target or, a type of target.

Figure 11: Key to the Template

1.3.7. Template Operation.

The preceding analysis demonstrated the construction techniques behind the formation of the *Template*. At its core, this has three independent, but interrelated methods of classifying AWS. The final discussion below, provides a number of basic instructions regarding the operation of the *Template*. These are key to the Templates unique flexibility, and key to the thesis' overarching aims. In the first instance, however, and in order to identify whether a weapon should be considered on the *Template* (or not), the following questions should be posed,

Is the weapon in question an AI or EAI, or a combination of such systems, that is designed to apply a lethal, or non-lethal force to combatants and/or military objects? If so, following its activation, does it have some degree of flexibility as to how it completes the four tasks assigned by the OODA loop, while remaining free from human coercion - though not necessarily from human supervision?

If the answer to both questions is yes, the weapon is autonomous. Thus, its use should be considered in light of the three *Template* axes. As previously noted, all weapons have the capability to apply an offensive force – and implicitly, a defensive force. And, because, in either case the applicable legal obligations may differ, this must be established for every deployment. This is also true regarding lethality, and consequently this must also be established for every deployment. The fact that the *Template* is capable of allowing for this change in classification, however, is somewhat significant and unique.

As the backbone of the *Template*, the categorization of AWS according to four levels of autonomy is highly desirable. With that said, however, the *Template* must also display flexibility on this axis, because an AWS 'structure' can also change according to the circumstances surrounding its deployment and operation. The Level Axis autonomy must not, however, be applied too rigidly. This need to change classification is perhaps best demonstrated by considering autonomous swarms.

The term 'swarm' that is typically used to refer groups of robots, designed and constructed to behave in a way that is synonymous with those found in nature.[267] A particular benefit of robotic swarms is that they are capable of changing their individual behaviors according to the information collected by the group as a whole. Because most swarms are constructed of many components that are each virtually identical, there is often no single leader.[268] Consequently, if one, or even several elements of the swarm are removed, whether by fault or by force, the swarm can continue to operate, right down to a single remaining survivor.[269]

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[267] Consider, for example, a project currently being funded by the European Union, by way of the Horizon 20:20 Programme. According to the European Commission the 'EVOLVINGROBOT' is a European Union (EU)-funded research project which has developed an artificial intelligence system to control tiny robots, enabling them to replicate the 'swarming' behaviour seen in insects such as bees or ants, or even in birds and fish. It is an innovation which could have far-reaching implications for a range of human activities, from medical to industrial, military and disaster relief'. See, The way of the future: 'warming robots' (Horizon 20:20) < https://ec.europa.eu/programmes/horizon2020/en/news/way-future-'swarming'-robots > accessed 9 January 2018. In the US there has also been a great deal of development of swarm technology. In 2017, for example, DARPA set a challenge in which 'U.S. Army, U.S. Navy, and U.S. Air Force academy teams compete in education-focused experiment to pave the way for future offensive and defensive swarm tactics for warfighters'. See, 'Service Academies Swarm Challenge Live-Fly Competition Begins' (*DARPA*) < https://www.darpa.mil/news-events/2017-04-23 > accessed 9 January 2018.

[268] Singer, *ibid,* n.33, 231

[269] *Ibid.*

A future militarized swarm might consist of a number of individual 'platforms' (such as UAVs) that were each capable of launching of firing further munitions (such as a Hellfire). When considered in isolation, such a platform would be classified as L2 AWS. However, where a collection of inter-connected swarming autonomous UAV's operated 'in sync', as per the previous paragraph, they would operate as a L3AWS. This change in classification is necessary because the 'beating heart' of the swarm is not its individual components, but its supervisory algorithm, or COP.

Similarly, each element of a swarm could carry an explosive charge. HRW has used this type of weapon, which they refer to as 'slaughterbots', to try to raise support for the prohibition.[270] In this instance, the individual elements of this swarm are L1AWS because once the force is applied, it is non-recoverable system – a munition. Nevertheless, for the very same reason, when acting as a swarm, slaughterbots are classified for the most part as L3AWS. The exception (in all instances) being, that if an autonomous swarm is capable of making decisions regarding the use of strategic assets such as nuclear weapons, they are classified L4AWS.[271]

The *Template,* therefore, accounts for swarms, and in fact, for all 'inter-connected' AWS deployments, whether the individual elements are identical, or not, by rounding up classification. For example, the *Template* defines a L1AWS as a non-recoverable weapon that is designed to destroy a target or, a type of target. The Brimstone is an example of a L1 AWS which is currently in operation. It is conceivable in the not-to-distant future, that a L2AWS, such as a fully autonomous UAV,[272] could be used as platform from which to launch a Brimstone. Given such a situation, and here it is imagined that the drone is not operating as part of a larger swarm, the 'weapons system' is the L2 AWS.[273] In other words, the fact that the Brimstone can carry out its own OODA assessment, is only relevant if it is fired by a human operator. Where, instead,

[270] Opponents of AWS have previously released a video depicting a future in which individuals can be targeted according to certain criteria such as their online presence. At the time of writing video has been viewed over 3 million times. See, https://www.youtube.com/watch?v=9CO6M2HsoIA accessed 7 April 2020. Also see, *ibid,* n.209.
[271] This latter incarnation might represent something similar to the Skynet system that is portrayed in the Terminator series of fictional movies previously discussed.
[272] The term fully autonomous here relates to the fact that exiting drones already have a number of autonomous features. They can, for example, currently carry out autonomous reconnaissance missions.
[273] Were a part of a larger swarm, the entire system may be identified as a L3 AWS, if for example the group was capable of independently reacting to the information gathered by the group, and direct itself, and potentially other systems to further operational objectives.

it is loaded onto an autonomous platform, the Brimstone becomes a part of that wider weapons system. This re-classification takes place even though the missile itself has not undergone any significant adaptation. Reclassification upon the *Template* in this manner is predictable, thus, the military decision-maker will know in advance of any given operation how a weapon is classified. Moreover, and central to the current research, its lawfulness can be established in advance. Of course, a change of classification can also occur in the opposite direction where the machine interaction is cancelled.

1.3.8 Regarding Meaningful Human Control.

Having identified the *Template* and demonstrated how it will support the unique legal analysis that appears in the following Chapters, the researcher must identify one further key concept - Meaningful Human Control (MHC). MHC is a term that was first coined by Richard Moyes of the Non-Governmental Organization (NGO) Article 36.[274] The GGE has placed somewhat of an increasing focus on it, and an element of the literature regarding AWS also has reference to it.[275] There is a need, therefore, for the research to have reference to. It is vital to note, however, that it is *not* a legal concept, is certainly not binding, and may not even be dependable.

Various incarnations of the term have been suggested previously,[276] though each manifestation arguably has its origins in DoDD 3009.09 - which refers to 'appropriate

[274]See, 'Who we are' (*Article 36*) https://article36.org/who-we-are/ accessed 14 January 2021.

[275] See e.g., Richard Moyes, 'Key elements on meaningful human control: Background paper to comments prepared by Richard Moyes, Managing Partner, Article 36, for the Convention on Certain Conventional Weapons (CCW) Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS) (Geneva 2010)'. Paper available at: https://docs.google.com/viewer?a=v&pid=sites&srcid=cmljaGFyZG1veWVzLmNvbXxwcm9qZWN0c3xneDplYjM5MjAzOTUzMDQwZTk accessed 14 January 2021. See also, Heather Roff and Richard Moyes, 'Meaningful Human Control: Artificial Intelligence and Autonomous Weapons Briefing paper for delegates at the Convention on Certain Conventional Weapons (CCW) Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS) (Geneva 2016)'. Available at: https://docs.google.com/viewer?a=v&pid=sites&srcid=cmljaGFyZG1veWVzLmNvbXxwcm9qZWN0c3xneDo2ZWZiNWI0YzRjOGQwNDIw accessed 14 January 2021. Also see Jenkins, *ibid,* n.113, 6. Here, Jenkins notes that the concept of MHC has recently become somewhat of a 'rallying cry'.

[276] For the reasons as to why certain contributors believe MHC is the preferred option see e.g., Bonnie Docherty et al, 'NEW WEAPONS, PROVEN PRECEDENT: Elements of and Models for a Treaty on Killer Robots, Human Rights Watch and the International Human Rights Clinic Harvard (2020) (hereinafter HRW 2020). The report states, for example, 'According to the group Article 36, "meaningful," compared to other potential qualifiers, is "general rather than context specific (e.g., appropriate) [and] derives from an overarching principle rather than being outcome driven (e.g., effective, sufficient)." "Control" is broader than alternative terms like judgment and intervention because it encompasses both the application of human reasoning and actions to ensure human intention is followed. Third, and most relevant for this report, the concept of control is frequently used in

levels of human judgement'. [277] Regardless of the precise phraseology, however, the matter of what constitutes this concept is highly debatable. Article 36 suggest that what it calls 'Black Box' AWS should be prohibited,[278] because they allow for the profile of a target to change after deployment. There is no great need to elaborate at this stage, but the primary point here is black box systems could not be sufficiently well controlled.[279] Article 36 suggest that at its most basic level MHC should (i) prevent a machine from applying force where there is no human control whatsoever, and (ii) prevent a human from simply pressing 'fire' where a computer has searched for, identified and 'locked on' to a target.[280]

On the other hand, some have argued that MHC can be sufficiently exhibited by the individual(s) who is/ are responsible for programming an AWS.[281] Those adopting such a position believe that because an AWS will always operate according to a set of rules, and/ or criteria which have been pre-determined, and pre-authorised by a human, a sufficient amount of human (meaningful) control has been inserted into the machine. These two definitions represent the outer edges of the MHC discussion, and they can be placed at either end of a spectrum,

Interpretations of Meaningful Human Control:

Figure 12: The Wide and Narrow interpretations of Meaningful Human Control.

international law and AI principles to promote accountability and reduce harm….International law often requires "control" to ensure legal responsibility'.

[277] See, *ibid*, n.3.

[278] Pamphlet, 'Regulating Autonomy in Weapons Systems' (Article 36, 2019), https://article36.org/wp-content/uploads/2020/10/Regulating-autonomy-leaflet.pdf accessed 20 April 2021.

[279] *Ibid.*

[280] See e.g., Roff and Moyes, *ibid*, n.275, 1.

[281] See e.g., Michael C. Horowitz and Paul Scharre, 'Meaningful Human Control in Weapons Systems: A Primer' (CNAS, March 2015), 15 https://www.jstor.org/stable/pdf/resrep06179.pdf accessed 8July 2021, and Chengeta, *ibid*, n.43, 859. Here the author identifies a member of the U.K. government has stated such.

There are, however, issues at both ends of this spectrum.[282] One the one hand, the definition of MHC offered by Moyes *et al* appear to require for human involvement within every single assessment regarding the application of force.[283] And, while it may not become manifestly evident until the latter chapters, that simply cannot be a viable interpretation. This is primarily because if a human was required to play a central role in every targeting decision, an AWS would not really be autonomous at all. Consequently, even if the wide definition was the one that states ultimately lent their support to – which may have the effect of prohibiting AWS – those weapons that remained legal would fall outside of the realm of this body of research, not being AWS.

Nevertheless, 'autonomous' creations are inherently unpredictable, and especially humankind. Therefore, the present researcher believes the narrow interpretation is also undesirable when viewed in isolation. Whether intended or not, mistakes could easily happen at the programming stage, which could lead to the machine malfunctioning. Indeed, even without a programming error, there can be no certainty that an Aws, like any other machine, will operate without fault. Some believe AWS malfunctions are inevitable,[284] and point, in particular, to an alleged accountability lacuna.[285] Noting, however, that even if it was true that AWS will malfunction at some stage, civilian harms will not necessarily occur as a result.

There is clearly some variance as to what certain individual and organization believe MHC should mean. And, as a result of these definitional disparities some rightfully question whether MHC should even remain the focus of debate.[286] Ryan Jenkins, for

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[282] Two authors also considering a similar scale identify five levels of MHC, and propose a regulative framework accordingly (noting that their framework is not grounded in international law). See generally, Daniele Amoroso and Guglielmo Tamburrini, 'What Makes Human Control Over Weapons Systems "Meaningful"?' (International Committee for Robot Arms Control (ICRAC), August 2019) https://www.icrac.net/research/ accessed 8 July 2021.

[283] See also, Human Rights Watch and the International Human Rights Clinic Harvard, 'Heed the Call: A Moral and Legal Imperative to Ban Killer Robots' (Human Rights Watch, 2018), 38 (hereinafter HRW 2018). Here, the report states: '[g]overnments from around the world have increasingly shared the views…that the development, production, and use of weapons without meaningful human control is unacceptable', and HRW (2020), *ibid,* n.276, 1. This similarly offers: 'Weapons systems that select and engage targets without meaningful human control are unacceptable and need to be prevented. All countries have a duty to protect humanity from this dangerous development by banning fully autonomous weapons. Retaining meaningful human control over the use of force is an ethical imperative, a legal necessity, and a moral obligation.'

[284] See generally, Rebecca Crootof, 'War Torts: Accountability for Autonomous Weapons' (2016) 164 U. Pa. L. Rev., 1347.

[285] *Ibid.*

[286] Ryan Jenkins, 'Averting the Moral Free-for-All of Autonomous Weapons' (2017) 41 Fletcher F World Aff. 119, 122-123.

example, notes that MHC is merely a stand-in for *reliable* decision-making – which, for the moment, only humans possess.[287] His point is that should AWS become perfectly reliable, the concerns that currently exist regarding the need for *control* will largely dissipate.[288] The present author agrees with this line of reasoning. Indeed, the potential for AWS to operate on a par with human decision-making, and in many instances surpass it, is at the very heart of the overall hypothesis.[289]

With the primary weaknesses of the wide and narrow interpretation identified, the researcher recommends an alternative – noting that, being a non-legal term, an ultimate definition of MHC is beyond the remit of the present thesis. Because the following legal analysis does have regard of the need to recognise some form of control, however, the researcher generally utilises a form of the existing International Humanitarian Law (IHL) concept of *the reasonable military commander*.[290] The International Criminal Tribunal for the Former Yugoslavia (ICTY) introduced this concept when considering matters related to IHL proportionality. They stated (identifying a narrow and wide interpretation of their own), that

> 'It is unlikely that a human rights lawyer and an experienced combat commander would assign the same relative values to military advantage and to injury to noncombatants. Further, it is unlikely that military commanders with different doctrinal backgrounds and differing degrees of combat experience or national military histories would always agree in close cases.'[291]

It must be stated that the court was not commenting on AWS. And there is no pressing need to discuss the facts of the case before the court at the present juncture. The point

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[287] *Ibid.*
[288] Jenkins, *ibid,* n.286, 122.
[289] Arguably humans are not perfect. And, when it comes to saving human lives, if perfection cannot be reached, improvements should be welcomed, welcomed whether these are due to, or supported by machine decision-making.
[290] See e.g., International Criminal Tribunal for the Former Yugoslavia: Final Report by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia (June 8, 2000) available at, https://www.icty.org/en/press/final-report-prosecutor-committee-established-review-nato-bombing-campaign-against-federal accessed 14 June 2021 (hereinafter ICTY NATO Bombing Report). See also generally, Robert D. Sloane 'Puzzles of Proportion and the "Reasonable Military Commander": Reflections on the Law, Ethics, and Geopolitics of Proportionality' 6 (2015) Harv. Nat. Sec. J., 299.
[291] ICTY NATO Bombing Report, *ibid,* para. 50.

here is, in making a post-act assessment the court was asking whether, in the circumstances, a reasonable military commander would, when in possession of the same information, have taken the same course of action? As the rules that are identified the following chapters will go on to show, this is a question that can be posed in terms of AWS deployments, both in regards of the jus in bello, but also in the jus ad bellum and IHRL where the commander may be replaced by the executive.

Nevertheless, in short, the concept can ensure that there is universal standard for assigning and recognizing a suitable level of *control*.[292] For present purposes MHC can be exhibited by the individual who is responsible for authorizing the deployment of an AWS for any given mission. Where the reasonable commander believes that an AWS that they were responsible for authorizing was likely to operate outside of their control once deployed, they should not deploy the AWS. This is considered in greater detail throughout the following analysis, but not least in Chapter Six regarding accountability. Seeing that it is not strictly a legal obligation, it is not encapsulated by a thesis 'rule'. However, the rules stemming from the legal analysis in the following chapters do find a way of ensuring MHC is written, at least implicitly, into the guiding principles. This central interpretation of MHC is represented as follows:

Interpretations of Meaningful Human Control:

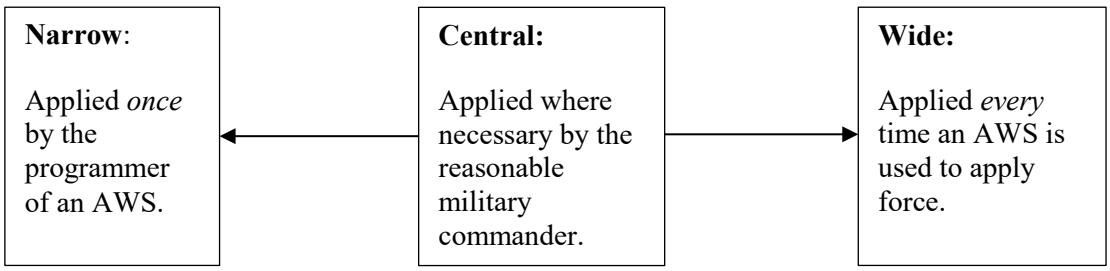

Figure 13: The Scale of Meaningful Human Control.

1.3.9 Chapter Conclusion.

Chapter One began by identifying the definitional lacuna within the current discussion regarding AWS. It also highlighted that in order to conduct a comprehensive analysis into the lawfulness of AWS, a suitable definition is a must. Part 1, therefore,

[292] For a further discussion regarding the reasonable military commander, which is particularly relevant to IHL collateral damage assessments, see, Ian Henderson and Kate Reece 'Proportionality Under International Humanitarian Law (IHL): The 'Reasonable Military Commander' Standard and Reverberating Effects' (2018) 51 3 Vanderbilt Journal of Transnational Law, 835.

deconstructed the concept of AWS into its constituent parts in order to provide a general definition. Part 2 compared this to a number of alternative versions. Though this analysis noted the dangers of setting the definitional bar too high, and particularly, of the dangers of setting the bar too low. The remedy was provided in Part 3, by way of the *Template* - the multi-dimensional system for classifying AWS. The *Template* provides a suitable method for distinguishing between individual AWS, and for accounting for the circumstances surrounding each deployment. In doing so, the first of the thesis' aims has been completed. And it is only with a continued reference to the *Template* that the present researcher is able to move on to begin the second purpose of this research - conducting a comprehensive assessment of the lawfulness of AWS.

CHAPTER 2. ASSESSING THE LAWFULNESS OF AUTONOMOUS WEAPONS SYSTEMS UNDER THE *JUS AD BELLUM*.

Chapter introduction.

The following chapter embarks upon the process of undertaking the second primary aim of this thesis – assessing the lawfulness of Autonomous Weapons Systems (AWS). In this instance, the focus is centred on the *jus ad bellum* – the corpus of law concerning the lawfulness of recourse (or not) to both threats and/ or use of force.[293] By utilising the *Template*, the researcher is able to conduct an unapparelled analysis of each area of contention in this sphere. Moreover, this investigation also yields the first of the *general principles* – the building blocks of the legal framework for regulating the use of AWS (otherwise referred to as rules). The international prohibition against a threat or use of force dominates the *jus ad bellum*. [294] Thus, Article 2(4) of the UN Charter provides the natural starting point for the analysis.[295] Part 2 proceeds by examining AWS in light of the first exception to the Article 2(4) prohibition – namely that of self-defence. Finally, Part 3 of Chapter Three examines the lawfulness of AWS deployments in light of humanitarian intervention and the other (limited) exceptions to the prohibition. In order to provide additional context to what is often an, unapologetically, future-looking analysis, a number of hypothetical scenarios are also introduced and considered throughout.

[293] Note the terms, the law *of*, or the *right to* war are also considered to be satisfactory interpretations. The terms *jus ad bellum* and just war theory are often used interchangeably. See e.g., Heather Roff, 'Lethal Autonomous Weapons and Jus Ad Bellum Proportionality', (2015) 47 Case W. Res. J. Int'l L. 37, 40. Here the author states, '*Jus ad bellum* is traditionally comprised of six principles: just cause, right intention, proper authority, last resort, the probability of success and proportionality. See also, Wing Commander (Dr) U C Jha, *Killer Robots: Lethal Autonomous Weapons Systems Legal, Ethical and Moral Challenges* (Vij Books India, 2016), 70. Jha similarly states, '*Jus ad bellum* comprises six principles: just cause, right intention, proper authority, last resort, the probability of success, and the response of declaring the war being proportionate'. Because these six principles do not necessarily represent legally binding obligations, this thesis examines them in Chapter Five under the heading of just war theory. Nonetheless, for a useful discussion see generally e.g., Stephen Coleman, 'Ethical Challenges of New Military Technologies' in Hitoshi Nasu and Robert McLaughlin (eds) *New Technologies and the Law of Armed Conflict* (T.M.C. Asser Press, 2014).

[294] See e.g., Dinstein (2017), *ibid*, n.254, para. 243, stating '[t]he pivot on which the present-day *jus ad bellum* hinges is Article 2(4) of the UN Charter.

[295] Art. 2(4) UN Charter, *ibid*, n.143.

Part 1: The Article 2(4) UN Charter Prohibition on the Threat or Use of Force

Any discussion involving the *jus ad bellum* necessitates addressing the seminal prohibition contained within in article 2(4) UN Charter regarding both threat and use of force. [296] That is, therefore, the primary focus of Part 1. A routinely espoused anxiety is that the introduction of AWS will make it easier for states to go to war,[297] which will, in turn, lead to a derogation of this fundamental *jus ad bellum* obligation. With this in mind, opponents of AWS are presently petitioning the UN to prohibit AWS by way of a new international treaty (the *Prohibition*).[298]

With reference to both the *Template*, and to a hypothetical scenario, Part 1 examines the claim that the introduction of AWS will lead to a derogation of the prohibition on the threat or use of force. In doing so, however, it identifies that there are many factors that need to be considered by the individual responsible for taking the decision before resorting to force.[299] These cannot, and have not, simply been cast aside by nations who consider themselves to be technologically superior to others. To do so would, not least, ignore Clausewitzian 'frictions', which are those often-unforeseeable characteristics distinguishing real war, from war on paper.[300]

Before continuing the analysis, the reader should note two caveats. First, in many instances, a resort to force will also be seen as a declaration of war.[301] As a result, the reality is that the lawfulness of certain acts can only be established by consulting both the *jus ad bellum* and the *jus in bello*. Therefore, given that Chapter Three's purpose is to assess the lawfulness of AWS under the latter, any relevant *jus in bello* issues are not considered in the following investigation. Secondly, the analysis of AWS under *jus ad bellum* is intentionally sub-divided into three separate examinations. Here, the

[296] Francis Grimal & Jae Sundaram, 'Cyber warfare and autonomous self-defence' (2017) 4 (2) Journal on the Use of Force and International Law, 312, 321.
[297] See e.g., HRW (2012), *ibid*, n.15, 3 and 9-41.
[298] FLI, *ibid*, n.7.
[299] Note that in most instances, an act of aggression (i.e., a breach of art. 2(4)) will constitute an act of war. In this event, an armed conflict would be declared (or implied) and International Humanitarian Law automatically triggered. It is possible that there may be limited circumstances where an act of aggression would not trigger IHL (because the act of aggression would not be constituting an act of war), and also (vice versa) where an armed conflict could be declared without there being an act of aggression. However, it is a dilemma that is based entirely upon threshold interpretations, and thus, it is beyond the scope of the present thesis to determine one way or the other. For a useful discussion, see generally, James A Green and Christopher P M Waters, 'Military Targeting in the Context of Self-Defence Actions' (2015) 84 Nordic J Int'l L, 3.
[300] Carl Von Clausewitz, *On War* (Michael Howard & Peter Paret eds., rev. ed. (1984) 138-140.
[301] See generally, Green and Waters *ibid,* n.299.

reality is that in many instances there will also be a natural overlap between the concepts being considered in each section. This is perhaps most noticeable in relation to a state's inherent right of self-defence (considered in Part 2), as a lawful response to a breach of Article 2(4) UN Charter (considered in Part 1). Nevertheless, in order to maintain clarity, these naturally linked lines of enquiry are intentionally examined individually.

2.1.2 The status of Article 2(4).

As previously noted, the purpose of this chapter is to assess the lawfulness of the use of AWS under the *jus ad bellum*. The consideration in this section being whether the introduction of AWS will lead to a derogation of Article 2(4) UN Charter. If it could be shown that the use of AWS does weaken this fundamental legal obligation it would, at the very least, need to be reflected in the thesis' proposed legal framework. However, if it could be established that the introduction of AWS did alter the *status quo* with regards to making it easier for states to wage war or use force, it would also lend a great deal of support to those calling for an absolute prohibition. Article 2(4) provides that,

> 'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations'.[302]

While Article 2(4) contains the widely recognised positive prohibition, it should be always be considered alongside Article 2(3) UN Charter. This contains an additional negative prohibition which obligates States to settle their disputes by non-violent means.[303] When considered holistically, the dual obligation contained within Arts 2(3) and 2(4) are largely considered to represent an *absolute* prohibition on the use of threat of force.[304] And this is clearly central to the UN's core purpose of maintaining

[302] *Ibid.*
[303] The full text of art. 2(3) UN Charter, *ibid,* n.143 states 'All Members shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered.'
[304] Francis Grimal, 'Missile Defence Shields: Automated and Anticipatory Self-Defence? (2014) 19 J. Conflict & Sec. L. 317, 325.

international peace and security.[305] Indeed, Article 2(6) UN Charter identifies that the overall prohibition is universally applicable regardless of whether a state is party to the UN Charter.[306]

As identified, for example, by Francis Grimal,[307] the prohibition is contained with a number of other soft law and non-binding instruments including, for example, the 1970 Declaration on the Principles of International Law Concerning Friendly Relations and Cooperation Among States.[308] The international Court of Justice (ICJ) has also previously identified that the Article 2(4) prohibition is customary in nature.[309] Thus, the prohibition contained within Article 2(4) is legally binding upon all States, regardless of whether or not they are party to the treaty. The wholly binding nature of Article 2(4) is further enhanced by the fact that its prohibition is widely accepted to have a *jus cogens* status, meaning that it is peremptory norm that cannot be derogated from.[310] The prohibition on the threat or use of force is, therefore, assigned the highest possible status under international law.

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[305] Article 1 UN Charter, *ibid,* n.143, states the UN's purposes as: '1. To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might appear to lead to a breach in the peace…' Note that the art. Applies only to international relations. Thus, it is not applicable to conflict of an internal nature only. See e.g., Dinstein, *ibid,* n.254, para. 244.

[306] Art. 2(6) UN Charter, *ibid*, n.143.

[307] Grimal (2014), *ibid,* n.304, at 336.

[308] Also see, Declaration on the Enhancement of the Effectiveness of the Principle of Refraining from the Threat or Use of Force in International Relations, GA Res 42/22, UN Doc A/42/22/766 (18 November 1987) (Use of Force Declaration). See also, the preamble to the Vienna Convention on the Law of Treaties (1969)1155 UNTS 331 (hereinafter VCLT).

[309] Case Concerning Military and Paramilitary Activities in and Against Nicaragua (Nicaragua v. United States of America), Merits, International Court of Justice (ICJ), 27 June 1986 (hereinafter *Nicaragua Case*). See also e.g., Dinstein*, ibid*. n.254*,* para. 243.

[310] See e.g., art. 53 VCLT, *ibid*, n.308. This states that a 'treaty is void if, at the time of its conclusion, it conflicts with a peremptory norm of general international law. Note also, however, that art. 31 VCLT states that 'A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.' For the purposes of the present convention, a peremptory norm of general international law is a norm accepted and recognised by the international community of States as a while as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character.' Some commentators have highlighted that this definition is not entirely satisfactory due to the fact that, inter alia, it relates to conflicts only between treaties and peremptory norms. See e.g., James A. Green, 'Questioning the Peremptory Status of the Prohibition of the Use of Force' (2011) 32 2 Michigan Journal of International Law, 215. However, see also: *Nicaragua Case, ibid,* n.309, paras. 189-190. Here, with reference to the work of the international law commission, and to the fact that both parties had attested to the same, the International Court of Justice (ICJ) acknowledged that the prohibition contained within Article 2(4) UN Charter has a customary international law character, and also, that it enjoys a *jus cogens* status. Also see, *Prosecutor v Furundzija* (Judgement), ICTY-95-17/1-T (10 December 1998) (hereinafter *Furundzija Case).*

2.1.3 Will Autonomous Weapons Systems Derogate the International Prohibition on the Threat or Use of Force?

A reoccurring postulation of those in support of the *Prohibition*, is that AWS will make it easier for states to choose to wage war or resort to threats or uses of force.[311] Despite explicit prohibition within Article 2(4) the argument they will do so anyway once they are armed with AWS. It is argued this will be the case, primarily, due to the undeniable accompanying reduction in death and/or injury to human combatants where AWS replace them.[312] Singer, for example, argues that unmanned systems reduce the threshold for waging war generally.[313] This he argues, is a viewpoint shared by human rights experts, and special operative 'terrorist hunters' alike.[314]

According to the report of UN Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions, Christof Heyns, AWS could lead to the *normalization* of armed conflict, and a lowering of the threshold for states to go to war or have recourse to force.[315] The implication (in light of Heyns' concerns) is that not only will the human cost be lowered, but, that by fielding AWS, the public will feel 'increasingly disengaged and leave the decision to using force as a largely financial or diplomatic question'.[316]

Other opponents, such as Peter Asaro, adamantly believe that AWS have 'the potential to lower the thresholds for nations to start wars'.[317] In his examination of the 'wider' consequentialist reasons for supporting a prohibition, Guglielmo Tamburrini argues

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[311] *Ibid*, n.297.

[312] HRW (2015), *ibid,* n.191, 29. Here, the report states, an 'arms race in fully autonomous weapons technology would carry significant risks. The rapidly growing number of fully autonomous weapons could heighten the possibility of major conflict'. This sentiment is repeated, though perhaps not so succinctly in, Human Right Watch and the International Human Rights Clinic Harvard, 'Making the Case: The Dangers of Killer Robots and the Need for a Preemptive Ban' (Human Rights Watch, 2016), 29 (hereinafter (HRW (2016)). This also suggests a 'growing number of fully autonomous weapons could heighten the possibility of armed conflict. See also, HRW (2018), *ibid*, n.283, 6 stating, AWS 'would threaten global security because they could lead to an arms race, proliferate to actors with little respect for international law, and lower the threshold of war.'

[313] Singer, i*bid*, n.33, 319.

[314] *Ibid.*

[315] Heyns, *ibid*, n.180, para. 58. Also see generally, paras. 57-62.

[316] *Ibid*, para. 58.

[317] Peter Asaro, 'On banning autonomous weapons systems: human rights, automation, and the dehumanization of lethal decision-making' (2012) 94 886, Int'l Rev. Red Cross, 687, 690. Also see, Peter Asaro, 'How Just Could a Robot War Be?', in Adam Briggle, Katinka Waelbers & Philip A. E. Brey (eds.) *Current issues in computing and Philosophy* (IOS Press, 2008). Here the author argues that nations with more advanced technologies with have a greater incentive to go to war with less technologically advanced states.

that AWS should be *expected* to negatively affect global peace stability due to the fact that nations who own them will be incentivized to start new wars.[318] In doing so he suggests that swarming AWS will be capable of eliminating a nuclear deterrents, which, in the long run, will lead to a much greater number of fatalities.[319] Similarly, leading opponent Noel Sharkey offers, AWS will lead to a reduction in human fatalities which would provide nations with fewer disincentives to start wars.[320]

It is clear from those opinions considered above, that many believe that the reduction in the cost of going to war is a real and concerning development. Indeed, most of those utilise the notion as a key element to support their continuing efforts to create a new international treaty to prohibit the use of AWS.[321] As can be seen from the preceding paragraphs, a secondary claim that is contained within the majority of these statements is that AWS will naturally lower the threshold of going war, and thus lead to a derogation of Article 2(4) UN Charter. Regardless of course that the prohibition within this provision is widely accepted as having *jus cogens* status.

One major, if not irreconcilable, failure with each of the postulations considered is that they fail to provide a sufficiently distinct definition of AWS. Thus, one cannot be certain whether a commentator is referring to a smart-grenade, a Phalanx, or a hunter-killer drone. In order to demonstrate why this is problematic, consider the following hypothetical scenario:

2.1.4 Scenario 1.

Australe has an expansive, technologically advanced, military. Its weapon's arsenals include nuclear warheads. For the past two decades, Australe has been involved in a protracted extraterritorial armed conflict with a much less well-equipped adversary, located in the region of Ingenii. For political reasons, Australe has recently begun to incrementally withdraw its combatants and hardware from Ingenii, following a decision to end the operation there. In the meantime, Australe has received

[318] Guglielmo Tamburrini, 'On banning autonomous weapons systems: from deontological to wide consequentialist reasons' in Nehal Bhuta, Susanne Beck *et al*. (eds.) *Autonomous Weapons Systems Law, Ethics, Policy* (Cambridge University Press, 2016), 139.
[319] *Ibid*, at 140.
[320] Noel E. Sharkey, 'Cassandra or the False Prophet of doom' (2008) 23 4 IEEE intelligent systems, 14, 16.
[321] Singer, *ibid,* n.33, does not necessarily support the call for a prohibition of AWS. Heyns, *ibid*, n.180 also calls for a moratorium in the first instance as opposed to an absolute prohibition.

intelligence,[322] *that a third state, Orientale, is close to manufacturing weapons-grade plutonium. Australe and Orientale do not share the same political values. Moreover, they have a violent past, having been at war with one and other on a number of occasions. There has, however, been a relative peace between the two states for over half a century.*

Nevertheless, Orientale have recently and publicly stated that it has initiated a plutonium development program, Moreover, on a number of occasions recently Orientale has also made it clear that it is in possession of Inter-Continental Ballistic Missiles (ICBM) that are capable of reaching all of Australe's most densely populated cities. Being somewhat concerned by this statement, Australe's executive is considering three alternative courses of action. These are, (i) refrain from attacking Orientale until more solid intelligence is gathered, and the matter is raised at the United Nations Security Council (UNSC), (ii) launch an operation against Orientale with the goal of locating and eliminating any viable nuclear threat, or (iii) deploy their full destructive capabilities with the view of overwhelming Orientale's defensive and offensive capabilities, in order to eliminate the threat, and ensure there is no chance of retaliatory strikes.

2.1.5 Will Increasing Autonomy Really Change How Nations Respond to an Emerging Crisis?

With the above scenario in mind, the following examination considers how the use of AWS could change how states respond to an emerging crisis. In the first instance, the author wishes to acknowledge that in reality, any executive body weighing up the decision whether or not resort to force would need to consider a great many more legal, ethical, and policy matters than those which are advanced in the following

[322] The DoD, for example, defines intelligence as, 1. The product resulting from the collection processing, integration, evaluation, analysis and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations. 2. The activities that result in the product. 3. The organization engaged in such activities. See, DoD Dictionary, *ibid,* n.146, 107. In addition, a pp16, the DoD dictionary defines all-source intelligence as, intelligence products and/ or organizations that incorporate all sources of information in the production of finished intelligence. See also, *The CIA World Factbook 2018-2019: The Central Intelligence Agency* (Skyhorse, 2018). This identifies that 'The Intelligence cycle is the process by which intelligence is acquired, converted into intelligence, and made available to policy makers. **Information** is raw data from any source, data may be fragmentary, contradictory, unreliable, ambiguous, deceptive, or wrong. **Intelligence** is information that has been collected, integrated, evaluated, analysed, and interested. Finished intelligence is the final product of the intelligence cycle ready to be delivered to the policymaker.'

discussion.[323] Nevertheless, the purpose of the present enquiry is to ascertain whether *Australe* would be *more* prepared go to war if it was in possession of AWS, than it would be if it was not in possession of AWS.

This is clearly a theoretical discussion. It is, however, grounded within the tangible concepts represented on the three axes of the *Template.* The four levels of AWS that make up the backbone of the *Template* are each considered in turn below. And, as with any discussion relating to the lawfulness of a particular AWS deployment, the two additional axes are also key, not least, because they relate directly to the prevailing circumstances surrounding each AWS deployment. With that in mind, two matters can be established in the present case, before the wider analysis is conducted.

The first of these is that of the three options being considered, course of action (ii) and (iii), would take place upon the *pro-active*, or *offensive* axis [O]. This is because neither course of action is taken in response to an immediate threat of a grave use of force or an actual armed attack.[324] Secondly, the purpose of this section is not (at least at this juncture), to speculate on the specifics of future weapons technology. Instead, the researcher continues under the presumption that lethal force would be required for operations (ii) and (iii) to succeed [L].[325] With that in mind, for the remainder of Part 1, any AWS being considered has already been assigned the *Template* designation O/L. Because the first course of action (i) does not involve a military operation, it is also presumed that no weapons will need be deployed. As a result, option (i) is not at the present moment relevant to the goal of establishing the lawfulness of AWS under the *jus ad bellum*, thus, there is no need to consider it any further.

2.1.6 Will the use of L1AWS Lead to a Derogation of Article 2(4)?

As a reminder, the present researcher classifies a Level 1 AWS as a munition that is either launched by a human operative or, from a L2 AWS (weapons platform). The first

[323] A further analysis would include, for example, whether or not *Australe* believed that the threat stemming from Orientale was sufficient enough that it could lawfully act in pre-emptive self-defence. This is considered in greater detail in Part 2. Therefore, in order to avoid repetition, there is no need to consider it further here.
[324] This is also considered in greater detail in Part 2.
[325] Noting that in theory a non-lethal cyber-attack could take down a state's entire facilities infrastructure and prevent them from utilizing their entire weapons arsenals. Indeed, as previously noted, the matter of whether opponents even seek to prohibit non-lethal AWS is central to both the ongoing discussion, and to the design of the Template. However, for the sake of the current conversation, the use of a cyber-attack in isolation would fall short of achieving Au*strale's* long term objectives.

thing to note here, is that where it is the latter, (and the system does not form a part of a wider L3 or L4AWS) the issue of meaningful human control (MHC), as introduced in the previous chapter, is largely satisfied. This is because a human combatant will authorise either the deployment of the munition, or the platform. That human would need to be aware of the prevailing circumstances surrounding each deployment, and, as this thesis will explore in the latter chapters, the same human can also be held accountable for the AWS actions.

With regard to option (ii) of the present scenario (and in lieu, for example, of a UN weapons inspection), *Australe* would need to establish for themselves whether *Orientale* did, indeed, have a nuclear capability. This is largely a strategic consideration, in that the threat would be somewhat hollow if it was clear that capability did not exist. Clearly, if the threat was known to be an empty one, *Australe* would be hard pushed to legally justify a resort to force.[326]

If choosing to establish the existence of nuclear weapons by resorting to force, it is very unlikely that could be achieved with the use L1AWS alone. Instead, given such circumstances, it is inevitable that human combatants and other weapons specialists would need to secure full, and possibly unrestricted access, to *Orientale*'s entire territory. In other words, a L1AWS could only be used in a supporting role. There would still need to be 'human boots on the ground'. Quite simply, in this instance, any reduction the cost of war would be a matter of degree, and not, as some commenters appear to believe, a matter of reducing the cost of war to zero.

It is also very unlikely that *Australe* would resort to option (iii) (i.e., an *overwhelming* attack) with the use of L1AWS. This is perhaps especially true where *Australe's* concerns were grounded merely in suspicion rather than firm intelligence.[327] Any state which did resort to such tactics would not only be in breach of Article 2(4),[328] but they will face widespread condemnation from the international community, and could potentially have diplomatic ties cut, and economic sanctions imposed.[329] This may be

[326] This is discussed in greater detail below. See also, Thomas Schelling, *Arms and Influence* (Yale University Press, 1966), 35-91, Here the author notes that the threat must be a credible one.
[327] As previously noted, a state may lawfully act in anticipatory self-defence. This is discussed in greater detail in Part 2 of the present chapter.
[328] Refer to the discussion in Part 2 regarding the lawfulness of self-defence actions.
[329] See e.g., art. 41 UN Charter, *ibid,* n.143.

strategically undesirable, given that either of these options could devastate even the most geopolitically powerful state.[330]

Such strategic considerations often play a key role in determining state behaviour. Indeed, arguably, no nuclear attack has taken place since 1945 due largely to the fact that states with nuclear capabilities (but differing ideologies) have the option to retaliate in kind. If *Australe* failed, for example, to destroy only one nuclear weapons silo, or, one nuclear submarine, the consequences could be nothing less than catastrophic. As Colin S. Gray notes, like it or not, nuclear weapons are an essential part of the functioning the balance of power and to the maintenance of the international order because of the fact that they present a potentially lethal future for all of humankind.[331]

While the current author is hesitant to agree with those who predict AWS could spell the end of humanity as we know it,[332] the introduction of AI for military purposes might in the same way as nuclear, go some way to improving international stability, rather than destroying it.[333] Nevertheless, here, while a L1AWS could be deployed as a replacement for a human combatant, it is more likely that that it would replace an existing (non-autonomous) munition. This would only happen where an L1AWS offered an advantage over an existing weapon, because, for example, it was more accurate, or, in some other way, more capable. Consequently, it is difficult to see why a state would be more prepared, and more often, to breach Article 2(4), and somehow reduce the cost of war by doing so.

2.1.7 Will the use of L2AWS Lead to a Derogation of Article 2(4)?

The previous examination considered scenario operations (i) and (ii) in light of L1AWS. It concluded that it is unlikely that L1AWS would alter the status quo with

[330] This discussion, which relates in part to Chapter VII UN Charter, *ibid,* n.143, is considered in greater detail below.
[331] Gray, *ibid,* n.66, 100-106.
[332] See e.g., FLI, *ibid,* n.7. This states, 'Lethal autonomous weapons threaten to become the third revolution in warfare…[in addition to gunpowder and nuclear]…Once developed they will permit armed conflict to be fought at a scale greater than ever, and at timescales faster than humans can comprehend. These can be weapons of terror, weapons the despots and terrorists use against innocent populations, and weapons that can be hacked to behave in undesirable ways. We do not have long to act. Once this pandora's box is opened, it will be hard to close.'
[333] See e.g., Michael C. Horowitz and Lauren Kahn, 'How Joe Biden can use confidence building measures of military uses of AI' (*The Bulletin,* 12 January 2021) https://thebulletin.org/premium/2021-01/how-joe-biden-can-use-confidence-building-measures-for-military-uses-of-ai/ accessed 22 January 2021.

regards to Article 2(4). The same principle would be applied to a L2AWS. This is because autonomous weapons platforms, will, by their very nature, be unable to determine wither or not a State has a clandestine facility for constructing, and/ or positioning weapons of mass destruction. It is theoretically possible that a fully robotic humanoid army of the future could replace humans in searching for such facilities. However, even with due regard given to the seemingly sprightly pace of technological advances in this area, the software and hardware that would necessitate such AWS is a long way off, and arguably may never be realized at all.

Instead, any operation that utilised L2AWS instead of manned weapons platforms, would merely reduce the number of humans involved in a particular operation, and will not eliminate them altogether. Thus, for some time at least, there will always be real costs associated with the decision to resort to force with an L2AWS. Furthermore, any difference between launching an overwhelming attack with a L1AWS, or an L2AWS is merely a moot point.

In essence, the need for the attack to be absolute remains the same. As do the repercussions, if (i) the overwhelming attack is unsuccessful, or (ii) the international community is determined to impose sanctions for breached of Article 2(4). Indeed, it is difficult to see how an autonomous platform would either suddenly, or eventually, lead to their possessors choosing to hold the citizens of third-party states as hostages, or of using a L2AWS as a means of placing pressure on political leaders in order to achieve one strategic and/ or political desires.[334] Instead, there are many factors at play in considering the decision to resort to force. And it is unlikely in the immediate or near future that any state is likely to choose to go to war, simply because it will be able to replace a limited number of manned platforms and/ or human combatants by using a L2AWS.

2.1.8 Will the use of L3AWS Lead to a Derogation of Article 2(4)?

The previous two analysis of L1AWS and L2AWS respectively, have shown both the strength of the *Template* (in particular its ability to distinguish certain types of weapons from others), and the fact that it is somewhat difficult to substantiate the claims that AWS (generally) will make it easier for states to resort to force. The investigation

[334] Anderson and Waxman, *ibid,* n.151, 18.

could, therefore, stop there, it being clear that not all AWS are alike in their potential to undermine existing jus ad bellum obligations, and specifically the Article 2(4) prohibition.

However, the following section continues the Part 1 assessment by considering L3AWS. It is very likely, that at some point in the future,[335] artificially intelligent, operational battle planning systems, will be used to *support* human military commander decision-making. When this happens, the concept of MHC will arguably be satisfied, given that a human is in, or at least on, the loop. If a system is capable of operating at speeds far in excess of human capability, one must consider the illusion of human supervision.[336] The point here is that depending upon the systems precise function and *modus operandi*, it may, regardless of supervision, be a L3AWS.

A human could also authorise the use of an operational battle planning system and not supervise each and every decision that it made. For example, the *Australe* executive (presumably with the support of the various military chiefs) could take the decision to invade *Orientale.* In this situation, the strategic decision would clearly be made by a human. And they could deploy, or initiate, a L3AWS to oversee the invasion operation to ensure the most appropriate decision was taken every time.

In this instance, a L3AWS could potentially authorise a great number of further actions. It could, for example, choose to deploy L1 and L2AWS (which in turn become an element of the wider L3 system), and control the movements and actions of manned systems (who are also arguably a part of the wider L3AWS). A L3 system may also

[335] Early versions of such systems can already be seen in development. See e.g., Jen Judson 'US Army's future battle command system is cleared for production' (*Defense News*, 13 January 2021) https://www.defensenews.com/land/2021/01/13/us-armys-future-battle-command-system-is-cleared-for-production/ accessed 28 April 2021.

[336] Indeed, a relevant discussion, and one that is expanded upon throughout this body of research, is whether a human-centric military, armed with increasing fast, and sometimes instantaneous weapons systems, such as hypersonic missiles, energy, and cyber weapons will be capable of keeping up with machine-speed decision-making. This is one concept that is discussed by the Futurist and author August Cole, co-author of the novels 'Ghost Fleet' and 'Burn-in: A Novel of the Real Robotic Revolution'. The podcast is available at, John Amble, 'MWI Podcast: The Robotic Revolution is upon us' (*Modern War Institute,* 27 May 2020), https://mwi.usma.edu/mwi-podcast-robotic-revolution-upon-us/>accessed 27 May 2020. As is discussed further in the following chapter, an exponential increase in the speed of operation is an additional reason why opponents sight AWS should be prohibited. Typically, they highlight the failure of algorithmic systems such Knight Capital Groups wall street trader. In short, this system was capable of trading stock at speeds far in excess of human capabilities. However, on 31 July 2012, the system malfunctioned and created an endless loop of transactions, losing Knight Capital US$460 million, bankrupting them in the process. See e.g., Scharre, *ibid,* n.20, 201-202.

deploy either lethal and/ or non-lethal force, which, depending upon the type of action, could also be used offensively or defensively. If this was the case, there is simply no doubt that a course of action, which was unsupported by either the executive or the military commander *could* escalate very quickly.

With regard to the present discussion such an invasion would, once again however, only reduce the *cost* of the resulting war. Other pressures would still be placed on the executive, not least those already referred to. Heyns is one commentator who suggests that such pressures may diminish altogether over time because humans will no longer have to consider losing loved ones, killing others or being killed. [337] Crucially though. these are not the only factors an executive will have to consider. Re-election may be the top of the list of alternative factors, not least for an executive trying to repair the damage of a largely unsuccessful 20-year war. That is not to say, however, that the introduction of L3 AWS does not start to make the discussion surrounding the use of AWS more complicated.

One such difficulty is in regard of autonomous swarms.[338] As previously noted, an autonomous swarm could neutralise a state's nuclear deterrent before it had a chance to use it.[339] Moreover, a swarm may even do so without having to carry out an *utterly* overwhelming attack. Tamburrini argues that a state in possession of nuclear weapons and autonomous swarming drones would therefore be encouraged to strike first, or risk having their own second-strike nuclear capability thwarted in a similar way.[340]

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[337] Heyns, *ibid,* n.180, paras. 57-58.

[338] Tamburrini, *ibid,* n.318, 140. Because the larger swarming weapons system, is made up of a vast number of independent systems that are each capable of communicating with one-and-other, and of determining their next course of action independently of human coercion (or else they would not be considered autonomous), a swarm is considered a L3AWS. A L3AWS swarm may consist of many identical components, such as the slaughterbots previously identified *ibid,* n. 209. A L3 AWS swarm could, however, also be constructed from non-identical systems. These may include, for example, L2 AWS platforms such as autonomous UAVs and tanks. The point is, that an autonomous swarm is able to determine its own course of action based on the observations of the group. For a discussion regarding ongoing swarm developments, see e.g., Jenkins, *ibid*, n.113, 3. Here, the author notes, for example, '[w]itness, for example, the Defense Advanced Research Projects Agency (DARPA) project, Collaborative Operations in Denied Environment (CODE). This project aims to enable multiple unmanned aerial vehicles to be able to communicate, collaborate, and coordinate their activities even if their communications links to human overseers have been severed, or "denied." (Notice this applies to other communications-denied environments, such as underwater. In fact, the military is also in the process of developing autonomous boats and submersibles.)'

[339] Tamburrini, *ibid,* n.318, 140.

[340] *Ibid*.

There are, however, two primary issues with this line of reasoning. In the first instance, in order for the (potential) nuclear capability to be effectively disabled, an *Australe* swarm would have to be large enough, and efficient enough, to do so with little in the way of confirmed intelligence of the location of the nuclear instillation (or more likely, instillations). In addition, *Australe* would need to be certain that *Orientale* had no further opportunity to defend itself, either individually, or collectively.[341] Second, the very same discussion could be said of any swarm that was being remotely supervised, as opposed to autonomous.

Figure 14: A visualization of armed swarming robots.

Nevertheless, while one clearly cannot be certain how a hypothetical situation such as this would play out on a real battlefield, it is arguable that *Australe* could never know for certain whether a swarm operation would be successful, regardless of whether such a swarm was autonomous or not. Moreover, as previously alluded to, while Tamburrini is correct to acknowledge some of the dangers that swarms *could* present, he is also a little hesitant to acknowledge that AWS of this type could potentially function as a strategic deterrent.[342] For every action, there is a reaction, and electro-magnetic swarm defence systems will also very likely become weapons of the future – autonomous or otherwise.

The present researcher acknowledges that L3AWS pose certain challenges, particularly to the concept of MHC. However, for the purpose of the present discussion, the use of

[341] Individual and collective self-defence is considered in greater detail in Part 2. However, for the sake of the present conversation, the point is that nations have allies who perhaps share the same political ideologies and aspirations, but who may also have considerable arsenals.
[342] Of course, that is not to suggest that the production and use of AWS should be supported for this reason. Only, that there is a legitimate alternative to Tamburruni's argument.

an autonomous swarm could be a less destructive option, than for example, the use of an existing alternative system such a weapon of mass destruction. If AWS do become the third age of warfare, as a number of experts predict they will,[343] they may also carry with them certain strategic idiosyncrasies – in much the same way as nuclear. If that was indeed the case, then wars, and acts of aggression, would arguably not become more likely, but less likely.

2.1.9 Will the use of L4AWS Lead to a Derogation of Article 2(4)?

In the previous examination, the researcher acknowledged that certain L3AWS could be problematic – particularly in regard of MHC. In the following discussion, those concerns are somewhat magnified. This is because the use of L4AWS may well lead to a reduction in the cost of war, though it is still dependent upon a number of factors. For example, if L4AWS are to be developed and deployed, they are perhaps more likely, initially, to reflect an L2AWS platform such as the Phalanx. In other words, early L4AWS will be designed to react to an immediate threat (which by the nature of the L4 categorization will be a strategic threat), in which there is simply no time for a human to authorise a use of force. As previously identified, such (defensive) uses are generally accepted practice, and often, they are not a classification of AWS that opponents appear to want to see prohibited.[344]

In scenario 1, however, there does not appear to be any 'urgency'. Hence the weapon is assigned the category L4AWS O/L, as opposed to L4AWS D/L. Instead, the primary contentious issue with L4 systems under the *jus ad bellum,* is that the very decision for resorting to force, or the threat thereof, may be taken out of human hands altogether. The difficulty presented here, is that even with perfect programming, L4AWS would not necessarily be restricted by political, economic and perhaps even legal parameters, in the same way a human.[345]

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[343] See e.g., FLI, *ibid*, n.7. This states, 'autonomous weapons threaten to become the third revolution in warfare'.

[344] This element directly relates to self-defence. Thus, it is considered in greater detail in Part 2.

[345] Of course, every AWS must be able to operate lawfully in every deployment. And, weapons developers, and programmers, will no doubt develop algorithms to ensure this happens. The point here is, not every relevant factor will be as set in stone as the provisions contained within the UN Charter, *ibid,* n.143. Indeed, policy and economic strategies may change in a heartbeat. Thus, it will be very difficult to programme these parameters in advance, or even to keep the AWS 'updated' on a regular basis. This would be especially true if the AWS was operating autonomously for long periods of time, in an environment where radio silence was essential.

It is unlikely, for example, whether a L4AWS would be capable of foreseeing, as part of its computation, that an invasion would be well received by *Australe's* electorate (self-preservation being an inherent trait in most politicians, as much as it is within the wider species), especially given the fact that *Australe* appears to have been engaged in an unsuccessful military action for the last twenty years. The political situation would be further influenced by any number of factors, but not least by the current state of *Australe's* finances. The financial cost of entering into another conflict which could last as long as that against *Ingenii*, may simply be out of the question when considered against the current threat level.

Moreover, it could be particularly unwise for an *Australe* L4AWS to take military from a strategic perspective. This is, not least, because any derogation of Article 2(4) would be as detrimental to A*ustrale's* own peace and security, as it would to the wider global outlook. In other words, if A*ustrale* were to eventually lower the threshold that was needed for an attack to be lawful, then they would also lower the threshold that was needed for someone to lawfully attack them.

The primary concern with L4AWS is two-pronged. In the first instance, their use might lead to a loss of *control* over one's national strategy, and second, the use of strategic AI/ AWS may lead to a loss of *understanding* of one's national strategy.[346] This is key to the classification of L4AWS regardless of the legal discipline under which they are being assessed because, as noted by a leading scholar in this area, 'strategy arises from

[346] Anzhelika Solovyeva and Nik Hynek, 'Going Beyond the "Killer Robots" Debate: Six Dilemmas Autonomous Weapon Systems Raise' Central European Journal of International and Security Studies 12:3 (2018) 166, 187. Here the authors in turn cite, Srđan T. Korać, 'Depersonalisation of Killing: Towards A 21st Century Use of Force Beyond Good and Evil?' Philosophy and Society (2018) 29 (1), 49, 62. The authors argue that the use of strategic AWS may lead to a 'loss of human control over the conduct of military operations, even the entire war…[making]…strategy in a world with autonomous weapons "impossible to predict."' With regard to the latter – loss of understanding - they identify that, 'Human strategy entails the instrumental use of violence in the pursuit of goals, usually social goals, has psychological attributes and a cultural dimension meaning human strategic goals may be hard to measure, and is essentially dynamic meaning human strategic goals may change in response to emerging situations and opportunities. In turn, AWS will be "ill-equipped to gauge these subjectively experienced and dynamic goals compared to more readily quantifiable goals," implying their limited ability to capture and reproduce subjective meanings inherent in human strategy.' See also, See e.g., Michael W. Meier, 'The strategic implications of lethal autonomous weapons' in Jens David Ohlin (ed), *Research Handbook on Remote Warfare* (Elgar 2019), and Kenneth Payne, 'Artificial Intelligence: A Revolution in Strategic Affairs? Survival (2018) 60:5, 7.

the enduring nature of the human condition. This need is ongoing, it can be ignored…but it cannot be abolished.'[347]

One clear limiting factor in programming Aws to make strategic decisions (or not) is that strategy planning always regards the future. This means it is always 'beyond reach…[and]…strategy for the future always lacks reliable empirical data.[348] In addition, however, strategic decisions and planning is inescapably intertwined with matters of policy and many other considerations that exist outside of mere legal obligations.[349] Regardless of the regime employing such, strategy is an inherently human concept, that must be designed to benefit only humankind.[350] And, because one could only reasonably delegate strategic decision-making to machines based upon guess-work, and with no idea of how a strategic perspective could change in the future it is simply a risk that is not worth taking. As a result,

RULE 1
States must be prevented from developing and deploying L4AWS that would be capable of strategic level decision-making.

2.1.10 Weaknesses in the Derogation Argument.

The restriction on the development and deployment of L4AWS occurs somewhat naturally. Predominantly, however, AWS will be just another 'instrument for the exercise of State authority'.[351] They will simply be, one, of a number of means, by which a state can seek to implement its grand strategy. Regardless of Article 2(4), wars (and uses of force) *will* continue to be fought for a variety of reasons. Individuals will crave power, wealth, and natural resources.[352] Communities will rise up against

[347] Gray, *ibid,* n.66, 108-09.
[348] *Ibid,* 87.
[349] Gray identifies that strategy is intended to secure a polities position in the global order by ensuring (via the use of diplomacy, trade, and military means), that its future, national, objectives are met.
[350] See, Gray, *ibid,* n.66, 108-109 where defines strategy as ends, ways, means, and assumptions, offering that '(political) *ends* are the purpose of the endeavour, (strategic) *ways* choose and specify how the (political) *ends* should be secured, (military) *means* are the tactical agents that must be employed in order to have operational consequences with the necessary strategic value, and *assumptions* are always likely to be crucially important for action contemplated in the future, since reliable empirical evidence about the consequences of future behaviour is certain to be missing at strategy selection time.'
[351] Ford, *ibid,* n.156, 430.
[352] Boothby, *ibid,* n.122, 231.

oppressors, overthrow dictators, or lay claim to a right of self-determination.[353] Empires will collapse, and battles will ensue where the parties are divided according to religion, ethnicity, race or tribe,[354] in the future, as they have done for centuries.

However, technological superiority has 'never served as an impetus for going to war'.[355] And, there is no empirical evidence to suggest otherwise.[356] Instead, as previously noted, the question of how much war occurs, and at what intensity and level of destructiveness, depends on a slew of much more significant factors' than simply the risk to one's own forces.[357]

That, in itself, however, is perhaps not the greatest weakness with the derogation argument. Instead, opponents fail to see the paradox in calling for a new treaty to prohibit a *jus ad bellum* use of a weapon, which is already prohibited by an existing *jus as bellum* treaty provision.[358] Not only that, but a *jus ad bellum* prohibition that most believe has achieved *jus cogens* status.[359] Therefore, if a nation is prepared to go to war, in the knowledge that it is in breach of Article 2(4) UN Charter, which sits atop of the international law hierarchy, it is unlikely that a new treaty is going to change such behaviour.[360]

No doubt critics will cite, as HRW do, that banning AWS will also prevent AWS from falling into the hands of nefarious leaders and/ or NSAGs.[361] And, it is indeed possible that, insofar as Non-International Armed Conflict (NIAC) is concerned,[362] the cost of war may well be reduced. This is because a single individual in possession of one or

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[353] *Ibid.*
[354] *Ibid.*
[355] Christopher P Toscano, 'Friend of Humans: An Argument for Developing Autonomous Weapons Systems' (2015) 8 J Nat'l Sec L & Pol'y 189, 266.
[356] Mull, *ibid,* n.142, 514, in turn citing, Alex Leveringhaus, *Ethics and Autonomous Weapons* (Palgrave Pivot, 2016), 13-14.
[357] Anderson and Waxman, *ibid*, n.151, 18.
[358] Mull, *ibid,* n.142, 515.
[359] *Furundzija Case, ibid,* n.310.
[360] Mull, *ibid,* n.142, 515.
[361] See e.g., HRW (2015), *ibid*, n.191, 7. Here it states '[o]nce developed, fully autonomous weapons would likely proliferate to irresponsible states or non-state armed groups, giving them machines that could be programmed to indiscriminately kill their own civilians or enemy populations'.
[362] An International Armed conflict arises between two states. See e.g., Common Article 2 of the four Geneva Conventions which state 'the present charter shall apply to all cases of war which may arise between two or more High Contracting Parties, even if the state of war is not recognised by one of them'. Also see, *Prosecutor* v. *Tadic* (decision on Jurisdiction) (ICTY Appeals Chamber, 1995) 35 ILM 35, 54 (1996), (hereinafter *Tadic Case*).

more AWS, could apply a considerable amount of force.[363] However, this argument also fails at the first hurdle because it is not unique to AWS.[364]

The lowering the cost of war argument is not only used with regard to AWS, but also with UAVs before them. [365] And, before that, the same was said of high altitude bombings.[366] Indeed, and in contrast to military might, as far back as the year 1096, Pope Urban II decided to ban crossbows simply because they allowed peasants to kill professional knights from greater distances.[367] If AWS fall into the 'wrong hands', then those hands might be just as capable of acquiring nuclear weapons, ICBMs, armed UAV's or B52 bombers.[368] As a result, the argument that AWS will somehow *uniquely* 'embolden tyranny and terrorism are fatally flawed.'[369]

2.1.11 Part 1: In sum.

The prohibition against the threat or use of force contained in Article 2(4) UN Charter undoubtedly has a *jus cogens* status. But, despite the fact that this is an international law norm which cannot simply be set-aside, one of the primary arguments in support of the prohibition, is that AWS will make it easier for states to go to war - and may even incentivize them to do so. With the support of the *Template* the Part 1 examination demonstrated that there are many factors, both internal and external, that any political leader must consider before resorting to force. For this reason, L4AWS are not supported. An autonomous munition, however, is clearly a very different to prospect. There is, therefore, no empirical evidence to support the claim that AWS will lead to a reduction in the cost of war, and a derogation of Article 2(4). In fact, the introduction of AWS could potentially lead to the exact opposite occurring. In addition, many of the arguments employed by opponents of AWS can be applied to any advanced weapon. One way to ensure a would-be aggressor could not breach Article 2(4) would

[363] Sasha Radin & Jason Coats, 'Autonomous Weapons Systems and the Threshold of Non-International Armed Conflict' (2016) 30 TEMP. INT'L & COMP. L.J. 133, 134, Ford, *ibid,* n.156, 430-433.
[364] Please note, the criteria that qualify an armed actor, or actors, as a NSAG are considered in greater detail in the following chapter. However, as noted by Dinstein, NIACs, or 'intra-state wars', can only be considered under the *jus in bello*, there being no *jus ad bellum* equivalent. See, Yoram Dinstein, *Non-International Armed Conflicts in International Law* (Cambridge, 2014) paras. 12-16.
[365] Anderson and Waxman, *ibid,* n.151, 18.
[366] *Ibid.*
[367] Toscano, *ibid,* n.355, 222.
[368] *Ibid.*
[369] *Ibid.*

be to ban all of these weapons. However, such a suggestion is very unlikely to gain further support.

Part 2: Autonomous Weapons Systems and the Inherent Right of Self-Defence.

Part 1 of Chapter Two identified the prohibition against the threat or use of force contained within Article 2(4) of the United Nation's Charter. In contrast, Part 2 introduces the first, lawful, exception to Article 2(4). This is contained within Article 51 UN Charter,[370] which identifies a State's *inherent right* of self-defence when it suffers an armed attack (or is faced within an imminent grave threat of force amounting to an armed attack).[371] The actual text of Article 51 appears as follows,

> '[n]othing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security.'[372]

Self-defensive acts can theoretically be divided into two components. One can first repel an attack (for example by intercepting it) and second, one can abate an attack (for example by destroying an adversary's ability to launch a further attacks). Nonetheless, the two are typically considered holistically as one in the same.[373]As is expanded upon below, for the sake of the present analysis, repelling and attack is referred to as

[370] Art. 51 UN Charter, *ibid*, n.143.
[371] *Nicaragua Case, ibid,* n.309, para. 191. This is discussed in greater detail in 2.2.2 (below).
[372] Art. 51 UN Charter, *ibid*, n.143.
[373] See e.g., Green, *ibid,* n.255, 101. Also see generally, James A. Green, 'Docking the Caroline: Understanding the Relevance of the Formula in Contemporary Customary International Law concerning Self-Defense' (2006) 14 Cardozo J Int'l & Comp L 429.

interceptive self-defence. This is a lesser supported concept identified by leading scholar Yoram Dinstein.[374]

Nevertheless, the typical trajectory of discussions regarding self-defence will first identify that for an act of self-defence to be lawful, an armed attack must first be established.[375] And second, that once it has the lawfulness of the response is then be calibrated by the *jus ad bellum* principles of necessity and proportionality[376] The primary purpose of Part 2 is to examine whether AWS can be deployed without offending these key *jus ad bellum* concepts. As previously, the *Template* is utilised to support the following analysis.

2.2.2 The Inherent Right of Self-defence.

The fact that a lawful exception to the so-called absolute prohibition on the threat or use of force exist, means that it should perhaps be more correctly referred to as the *almost* absolute prohibition.[377] Nevertheless, Article 51 is largely understood to be codification of well-established principles deeply rooted within customary international law.[378] The Charter's recognition of a state's inherent right to defend itself when attacked is arguably pragmatic, realist, and necessary. Indeed, the drafters of the UN Charter themselves sought to acknowledge that an absolute prohibition on the use of force is an unachievable aspiration.[379]

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[374] Yoram Dinstein, *ibid,* n. 254, 231-235.
[375] Green (2015), *ibid*, n.255, 99.
[376] *Ibid,* 100-102. Noting that art. 51 UN Charter, *ibid*, n.143 carries two further obligations. There are that a state must immediately report all acts taken in self-defence to the UNSC, and that they must cease the forceful action once the UNSC has acted of its own. It is important to also note that there are two primary interpretations of *jus ad bellum* proportionality, a narrow legalistic version, and a wider theoretical version. This is largely due to the fact just war theory and the *jus ad bellum* are often used interchangeably. The present analysis is focused upon the lawfulness of AWS in light of the *jus ad bellum*. Just war theory proportionality is considered in greater detail Chapter Five.
[377] Nico Schrijver, 'The Ban on the Use of Force in the UN Charter', in Marc Weller (ed.) *The Oxford Handbook of the use of Force in International Law* (Oxford University Press, 2015), 465.
[378] This recognition has been noted since the time of Grotius. See e.g., Christine Chinkin and Mary Kaldor, *International Law and New Laws* (Cambridge University Press, 2017), 136.
[379] Note the Kellogg-Briand Pact attempted to entirely prohibit the use of force. Though still theoretically binding law, the prohibition contained within it has done little to stop the onset of armed conflict – including, perhaps most noticeably, WWII. For a discussion see e.g., Julie M Bunck and Michael R Fowler, 'The Kellogg-Briand Pact: A Reappraisal' (2019) 27 Tul J Int'l & Comp L 229, 229. The authors note the 'Kellogg-Briand stands as one of history's most universally scorned and criticized international agreements…[however]…[a]lthough Kellogg-Briand plainly failed to stop wars from breaking out and was marked by serious institutional and procedural defects, it stood as an important early venture in multilateralism.'

A significant criticism of Article 51 is its failure to precisely define the contours of what constitutes an *armed attack*. Though in absence of a treaty definition the International Court of Justice (ICJ) has stipulated that the gravest forms of force should be distinguished from those less grave.[380] An 'encounter' between Chinese and Indian combatants in the Himalayas, for example, in which stones were thrown, and physical blows were exchanged, would most likely fail to qualify as an armed attack.[381]

In contrast, there are ways in which a cyber-attack could qualify as an armed attack,[382] though there is some disparity in the literature. This is summarised by Grimal who notes,[383] for example, that while Sklerov believes there should be a strict liability for all cyber breaches,[384] other such as Silver believe Article 2(4) cannot breached where the attack is non-kinetic.[385] Nevertheless, while it may not be entirely clear where the exact boundary lies, the common understanding is that an armed attack should refer to a 'most grave form of the use of force'.[386]

A re-strictive reading of Article 51 leads to a situation where a victim state must have suffered an armed attack before it can act in self-defence.[387] However, the general view

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[380] At, *Case Concerning Oil Platforms* (*Islamic Republic of Iran v. United States of America*) ICJ (6 November 2003), para 51 (hereinafter *Oil Platforms* Case) the court restated its own judgement from *Nicaragua Case, ibid.* n.309, para. 191.

[381] See e.g., Dinstein, *ibid,* n.254, para. 550. See also e.g., BBC News, 'Indian and Chinese troops "clash on border" in Sikkim' (*BBC News*, 10 May 2020) < https://www.bbc.co.uk/news/world-asia-52606774> accessed 8 June 2020, Jeffrey Gettleman and Steven Lee Myers, 'China and India Brawl at 14,000 Feet Along the Border' (*The New York Times*, 30 May 2020) < https://www.nytimes.com/2020/05/30/world/asia/india-china-border.html> accessed 8 June 2020. Chinkin & Kaldor, *ibid,* n.378, 137 also note that '[w]hile there must be cross-border forcible action…minor skirmishes are unlikely to be accepted as such, even if they involve loss of life'. In support the authors identify, Eritrea-Ethiopia Claims Commission, Partial Award on the jus ad bellum: Ethiopia's claims 1-8, 19 December 2005, paras. 11-12.

[382] See, Schmitt (ed), *ibid*, n.143. Rule 92 states: 'A cyber attack is a cyber operation, whether offensive or defensive, that is reasonably expected to cause injury or death to persons or damage or destruction to objects.' The manual bases this rule upon Article 49(1) API which provides 'attacks means acts of violence against the adversary, whether on offence or defence'. Also see the decision in, *Tadic Case, ibid,* n.362, paras. 120 and 124.

[383] Francis Grimal, 'Twitter and the jus ad bellum: threats of force and other implications (2019) 6:2 Journal on the Use of Force and International Law, 183, 190.

[384] Matthew J Sklerov, 'Solving the Dilemma of State Responses to Cyberattacks: A Justification for the Use of Active Defenses against States Who Neglect Their Duty to Prevent' (2009) 201 Military Law Review 1, 54-55.

[385] See generally e.g., Daniel B. Silver, 'Computer Network Attacks a Use of Force Under Article 2(4) of the United Nations Charter' in Michael N. Schmitt and Brian T. O'Donnell (eds.) Naval War College International Law Studies, Vol. 76, Computer Network Attack and International Law, (Newport, 2002), 73. Also see, Matthew C. Waxman, 'Cyber Attacks as "Force" Under UN Charter Article 2(4)' (2011) 87 INT'L L. STUD. 43.

[386] *Nicaragua Case*, *ibid*, n.309, para. 191.

[387] Dinstein, *ibid*, n.254, para. 543 notes this is quite striking considering Art. 2(4) refers to threats of force as much as it does uses of force. Nonetheless, at paras. 585-586, the author also offers that a

is that it is not the strictly the case.[388] This is a further pragmatic acknowledgement which, recognises that a victim state would be at an considerable disadvantage if it had to suffer potentially catastrophic losses before it could react lawfully.[389] Instead, the widely supported view is that a state may resort to force in anticipatory self-defence in respect of a *threatened* armed attack amounting to a grave use of force.[390]

In all instances, whether resorting to force in self-defence of an actual armed attack, or in response to a threatened armed attack (amounting to a grave use of force), [391] the act in question must adhere to the customary *jus ad bellum* principles of necessity and proportionality.[392] Neither of these are directly referred to in the UN Charter.[393] Nevertheless, they are considered to be 'essential components of the normative framework of self-defence'.[394] These fundamental *jus ad bellum* principles have their origins in Daniel Webster's formulation that was contained in correspondence regarding what is commonly referred to as the *Caroline incident.*[395] In it, Webster stated that,

> '[w]hile it is admitted that exceptions growing out of great war of self-defence do exist, those exceptions should be confined to cases in which the necessity of self-defence is instant, overwhelming, leaving no choice of

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restrictive reading is needed, i.e., one that supports the notion that a state may only lawfully act in self-defence where it has suffered an armed attack.

[388] Green (2015), *ibid*, n.255, in particular 104-107. See also, Noam Lubell, 'The Problem of Imminence in an Uncertain World' in Marc Weller (ed), *The Oxford Handbook of the Use of Force in International Law* (Oxford University Press, 2015) 695, 718.

[389] The point is, somewhat perversely, in the event of an overwhelming attack, the victim state would be incapable of doing so. See e.g., Chinkin & Kaldor, *ibid,* n.378, 148. Here the authors identify that a strict reading of art. 51 would be paradoxical, particularly with regards to nuclear weapons and other weapons of mass destruction.

[390] This is discussed in greater detail below when the researcher considers the Caroline Incident (1837). Nevertheless, there is an argument that a more restrictive reading of art. 51 – i.e., that there *is* a need for a state to have suffered an armed attack - overrides the customary acceptance of anticipatory self-defence. However, in, *Nicaragua Case*, *ibid,* n.309, para. 35, the ICJ refused to accept that is the case.

[391] See, *Nuclear Weapons Advisory Opinion, ibid,* n.73, para. 41. Here the court identifies '[t]he submission of the exercise of the right of self-defence to the conditions of necessity and proportionality is a rule of customary international law…[and]…[t]his dual condition applies equally to Article 51 of the Charter, whatever the means of force employed.'

[392] *Nicaragua Case*, *ibid,* n.309, para. 94.

[393] See e.g., Dinstein, *ibid,* n.254, para. 651. Here the author notes that Article 51 does not contain a 'specific' reference to necessity and proportionality.

[394] See, Oliver Corten 'Necessity' in Marc Weller (ed) *The Oxford Handbook of the Use of Force in International Law* (OUP, 2017), 868, in turn citing the Institute de Droit International, Santiago Session 27 October 2007.

[395] For a useful discussion see, Martin A Rogoff & Edward Collins J, 'The Caroline Incident and the Development of international Law' (1990) 16 Brook. J. Int'l L. 493, Green, *ibid*, n.373.

> means, and no moment for deliberation. It will be for it to show, also, that…[it]…did nothing unreasonable or excessive, since the act, justified by the necessity of self-defence, must be limited by that necessity, and kept clearly within it.'[396]

Webster's formulation is widely supported, and as noted, recognised as being customary in nature. [397] Thus, the second thesis rule is presented thus,

RULE 2
An AWS must not be delegated decisions which regard the use or threat of force, other than where such a decision is in self-defence, and only then where the need to act is instant, overwhelming, with no choice of means, and no moment for deliberation.

An act of *anticipatory* self-defence must be in response to an 'imminent' armed attack.[398] Though imminence is without a definition in law,[399] an act taken against an imminent threat is generally accepted to be lawful where there is a 'specific and identifiable threat, which is highly likely to occur'.[400] This is in contrast to an act of pre-emptive self-defence, which is taken against latent and non-imminent threat.[401] Therefore, while anticipatory self-defence is, subject to certain conditions, acceptable

[396] US secretary of State Daniel Webster, letter to Henry S Fox (24 April 1841), in British and Foreign State Papers (1841-1842), 1129-1139 (1857). See also, J.B Moore, *Digest of International Law* (1906), 214.
[397] *Nicaragua Case, ibid,* n.309, *Nuclear Weapons Advisory Opinion, ibid,* n.73, *Oil Platforms Case, ibid,* n.380 para. 76, and, Case Concerning Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Rwanda), International Court of Justice (ICJ)), 18 September 2002, para. 147 (hereinafter *Armed Activities Case*).
[398] According to the ICJ, there must be no moment for deliberation, *Nicaragua Case*, *ibid,* n.309, para. 191.
[399] Green (2015), *ibid,* n.299, 105, citing Lubell, *ibid*, n.388, 702.
[400] Green (2015), *ibid,* n.299, at 105, citing Lubell, *ibid,* n.388, 702-705.
[401] Grimal, *ibid*, n.304, 328. Here the author notes U.S. policy post 9/11 was founded upon the notion that it 'would resort to the pre-emptive use of force "even if uncertainty remains as to the time and place of the enemy's attack"'.

practice,[402] the relatively recent practice of pre-emptive self-defence is not widely supported.[403]

The *jus ad bellum* requirement of necessity has two components, (i) First, that the State has exhausted all non-forcible measures, and, (ii) And secondly, that it would be wholly unreasonable to expect the responding state to attempt a non-forcible response.[404] As noted by Dinstein, at its heart, the principle requires that a state acting in self-defence *must* believe that force is a necessary response to an armed attack 'because no practicable alternative means of redress are within reach'.[405] In other words, a state may only respond with force when to do so is the last resort.

The principle of proportionality within the *Jus ad bellum* ensures that a defensive response remains true to Webster's formulation i.e. that the force applied in response is not 'unreasonable or excessive' with regards to abating or repelling an attack.[406] Dinstein, for example, notes that this is 'frequently depicted as the "essence of self-defence"'.[407] 'Repelling/ intercepting is the act of neutralizing an attack that is in progress, such as intercepting an intercontinental ballistic missile (ICBM) in midcourse flight. Whereas 'abating' refers to the additional act of preventing further attacks. This

[402] In, *Nicaragua Case, ibid,* n.309, para. 191, the ICJ state that for anticipatory self-defence to be lawful, it must be in response to a threatened armed attack. For a discussion see e.g., Ashley S. Deeks 'Taming the Doctrine pf Pre-emption', in Marc Weller (ed) *The Oxford Handbook of the Use of Force in International Law* (OUP, 2017), 655. The author identifies that Israel's use of force in Egypt in 1967 'where Israel attacked Egypt's air force after Egypt massed its forces on the Israeli border and closed off the Straights of Tiran' is an example that scholars often cite is a lawful act of anticipatory self-defence. Deeks also discusses a third concept – preventative self-defence. This is considered in greater detail in Part 3. As noted by Grimal, *ibid,* n.304, 327, the court has also noted that in practice there is also the requirement that the action is taken in response to an *imminent* threat. This reflects Daniel Webster's formula in the Caroline Incident - which is largely believed to be where the concept of anticipatory self-defence originates - which identifies that there must be 'no moment for deliberation'. The result is that providing the defensive use of force is in response to an imminent, sufficiently grave threat, an act of anticipatory self-defence is generally considered lawful. See, Grimal, *ibid,* n.304, 237.

[403] In 2002, the U.S. attempted to remove this requirement, by identifying an additional, and highly controversial concept of pre-emptive self-defence. In short, an act the pre-empts, as opposed to anticipates, focuses upon a 'potential future attack, even if the timing and place of such an attack is uncertain'. However, in 2005, the United Nations General Assembly (GA) 'failed to endorse any notion of pre-emptive self-defence', and many States and commentators believe that it stretches the interpretive elastic to breaking point. See, Grimal, *ibid,* n.304, at 328-329.

[404] Grimal, *ibid,* n.304, 326.

[405] Dinstein *Ibid*, n. 93, at para .656.

[406] Grimal, *ibid,* n.304, 326.

[407] Dinstein, *ibid*, n.254, 657 citing, I. Brownlie, *International Law and the Use of Force by States* (1963), 279, n.2 and, R. Ago, 'Addendum to eight Report on State Responsibility' [1980] II (1) *ILC Ybk* 13, 69.

could, for example, involve destroying the missile launch facility from which the ICBM originated.

A proportionate response does not require a numerically identical response.[408] But, if excessive force is used to repel or abate an attack, a 'defending' state may be seen to be acting as the aggressor, and that it is engaged in the act of launching a retaliatory or reprisal strike – which is unlawful.[409] This is all relevant to the current investigation which seeks to identify whether or not AWS deployments run counter to these fundamental principles. It may be the case, for example, that an act of self-defence with an AWS would be considered unreasonable or excessive in the circumstances, thus in breach of *jus ad bellum* proportionality. In order to determine whether is the case, the Part 2 analysis has regard of a second scenario.

2.2.3 Scenario II

An undisclosed period of time has passed since Scenario I, in which Australe was considering which of three potential pathways it would follow. Ultimately, due, not least, to Article 2(4) UN Charter and the lack of solid intelligence, the Australe executive refrained from taking the decision to use force against Orientale. Nevertheless, Australe's Integrated Air Defence System (InADS),[410] raises the alarm to indicate that Orientale has launched a number of missiles. InADS are typically constructed of many individual elements,[411] and Australe's includes an Airborne Early

[408] Note the dissenting opinion of Judge Higgins, *Nuclear Weapons Advisory Opinion, ibid,* n.73, para. 5, Grimal, *ibid,* n.304, 326.

[409] See for example, Shane Darcy, 'Retaliation and reprisal', in Marc Weller (ed.) The Oxford Handbook of the use of Force in International Law (OUP 2015), 879-896. At pp 879, the author also notes, for example, that while there is no identifiable statutory provision outlawing strikes of this nature, there is an 'overwhelming weight of opinion…that a use of force by way of retaliation or reprisal is generally unlawful'.

[410] NATO, for example, provide that their integrated air and missile defence system, (NATO IAMD) 'is the defensive part of the Alliance's Joint Air Power, which aims to ensure the stability and security of NATO airspace by coordinating, controlling and exploiting the air domain. It incorporates all measures to deter and defend against any air and missile threat or to nullify or reduce the effectiveness of hostile air action. NATO IAMD can address threats from the air, on land or at sea, which may include chemical, biological, radiological and nuclear, as well as electromagnetic and cyber threats'. See, Integrated Air and Missile Defence, (*NATO,* 15 April 2019), < https://www.nato.int/cps/en/natohq/topics_8206.htm> accessed 10 June 2020.

[411] See e.g., DoD Dictionary, *ibid*, n.146, 106. Here the DoD define integrated air and missile defence as, 'The integration of capabilities and overlapping operations to defend the homeland and United States national interests, protect the joint force, enable freedom of action, by negating an enemy's ability to create adverse effects from their air and missile capabilities.'

Warning and Control System (AEW&C).[412] *Australe also operates a Missile Defence shield (MDS), which is also comprised of a number of independent systems.*[413] *The AEW&C has identified the locations from which the missiles were launched. These include ICBMs launched from within Orientale's territory, as well as medium range 'theatre' ballistic missiles launched from Orientale's Naval vessels. All missiles are detected in the early stage of their trajectory, known as the boost phase.*

Similar to the analysis in Part 1, the remainder of Part 2 considers the above scenario in respect of the categories of AWS identified upon the backbone *Template*. And the primary purpose of the analysis is to identify whether an autonomous response by *Australe*, would somehow breach of Article 51 UN Charter, and/ or the *jus ad bellum* principles of necessity and proportionality.

Arguably, there is no need for the current analysis to consider such defensive scenarios because opponents of AWS typically refer only to wanting to prohibit o*ffensive* AWS. And given that the majority of successful ballistic missiles interceptions will occur during the midcourse phase,[414] the act of destroying a ballistic missile in an

[412] *Ibid*. See also DoD Dictionary, *ibid,* n.146, 69. Here the DoD define an early warning as an '[e]arly notification of the launch or approach of unknown weapons or weapons carriers', and, DoD Dictionary, *ibid,* n.146, 10 where an airborne early warning system is defined as, '[t]he detection of enemy air or surface units by radar or other equipment carried in an airborne vehicle, and the transmitting of a warning to friendly units'. Also see, AWACS: NATO's 'eyes in the sky', (*NATO,* 17 March 2020), < https://www.nato.int/cps/en/natolive/topics_48904.htm> accessed 10 June 2020. Here, NATO identify E-3A's (or AWACS). These are modified Boeing 707's that are equipped with 'long-range radar and passive sensors'. The information collected by AWACS can be transmitted 'directly from the aircraft to other users on land, at sea or in the air.' An AWACS 'is able to track and identify potentially hostile aircraft operating at low altitudes, as well as provide fighter control of Allied aircraft. It can simultaneously track and identify maritime contacts and provide coordination support to Allied surface forces. Under normal circumstances, the aircraft can operate for about eight hours (and longer with air-to-air refueling) at 30,000 feet (9,150 meters). The active surveillance sensors are located in the radar dome…and provides the AWACS aircraft with 360-degree radar coverage that can detect aircraft out to a distance of more than 215 nautical miles (400 kilometers). One aircraft flying at 30,000 feet has a surveillance area coverage of more than 120,000 square miles (310,798 square kilometers) and three aircraft operating in overlapping, coordinated orbits can provide unbroken radar coverage of the whole of Central Europe.'

[413] For a useful introductory discussion of the potential strategic benefits of missile defence shields see, Jonathan Marcus 'Nato's missile defence shield "up and running"', (BBC News, 20 May 2012), < https://www.bbc.co.uk/news/world-europe-18093664> accessed 11 June 2020. Also see, Robin Emmott, 'U.S. to switch on European missile shield despite Russian alarm', (Reuters, 11 May 2016), < https://uk.reuters.com/article/uk-nato-shield/u-s-to-switch-on-european-missile-shield-despite-russian-alarm-idUKKCN0Y216T> accessed 11 June 2020. For more information regarding NATO's Ballistic Missile Defence (BMD) system, (including a short but very useful film and commentary), see, Ballistic Missile Defence (*NATO,* 9 October 2019) < https://www.nato.int/cps/en/natohq/topics_49635.htm> accessed 11 June 2020.

[414] The three phases of a ballistic missile (BM) travel are discussed in greater detail below.

environment that is devoid of humans is also arguably a non-lethal response.[415] This is significant, due to the fact that many opponents only wish to prohibit lethal AWS otherwise referred to as LAWS.[416]

Nevertheless, the current researcher believes that it is a mistake to remove an entire class of weapons from the analysis. This is, not least, because ICBMs will not to be the only means a would-be aggressor would have at their disposal. Indeed, there will almost certainly be future instances in which an AWS such as a phalanx will need to apply force to a vessel which contains at least one human combatant in order to prevent it from carrying out an armed attack. And, given such circumstances the responding defensive act would clearly be 'lethal'.[417]

In addition, and as previously noted, weapons systems can contain many individual elements, none of which can be explicitly identified as being either defensive of offensive. Instead, the following analysis utilises the *Template* to ensure the thesis' investigation into the lawfulness of AWS is unabridged – even if, at times, the conclusions are the same.

2.2.4 Assessing the lawfulness of self-defensive acts with the use of Autonomous Weapons systems.

Due to the integrated nature of the armed attack, there can be little doubt that it is a deliberate manoeuvre.[418] And, from a strategic perspective, the risk to *Australe*

[415] This is, however, open to interpretation. The Oxford Dictionary, *ibid,* n.87. This supplies that lethal means: 'sufficient to cause death'. However, it also provides the further definition of: 'very harmful or destructive', which arguably is referring to objects and the environment as much as it is to humans.

[416] Mull, *ibid,* n.142, 476. The author states his analysis 'only addresses AWS that are designed to lethally attack personnel targets (hence LAWS) because the type of weapons described in the next section such as counter rocket and missile defense systems that are designed solely as a means to preserve life by attacking an inbound projectile are not subject to the same arguments regarding honor, morality, distinction, or proportionality even if designed with full autonomy and again highlight offensive weapons, and lethal arguments.

[417] Here the author envisages strategic or 'heavy' bombers such as the B-21 Raider. See e.g., B-21 Raider (*Northrop Grumman*) https://www.northropgrumman.com/what-we-do/air/b-21-raider/ accessed 9 July 2021. Of course, in the future these could be operated either remotely or autonomously, with the effect that they might be engaged and disabled without 'lethal' force. Some contributors, such as Mull, *ibid,* n.142, dismiss certain defensive actions - i.e., counter rocket and missile defence shields – even though a terminal phase counter rocket system such as the Patriot or PAC-3 can also engage manned combat aircraft.

[418] It may be the case that at the boost phase, and early midcourse phase it could be considered to be more of a threat of force than it is an actual armed attack. Though this may be merely a moot point as one could argue that would also be lawful to act in anticipatory self-defence - providing an ICBM missile launch suggested that the threat of force is imminent. See, Grimal, *ibid,* n. 304, 336. An interesting discussion, and one which the author is currently considering elsewhere, is whether a nation could be

increases as more time passes because ballistic missiles have a maximum flight time of approximately 30 minutes. As a result, it is unlikely that *Australe* would attempt to seek prior authorization to use force from the UNSC. Indeed, scenario II appears to offer the exact criteria in which the inherent right to self-defence contained within Article 51 is intended to apply. *Australe's* most pressing concern is dealing with the armed attack it is currently suffering, and that originated in *Orientale*.

With the Article 51 requirement for an armed-attacked qualified, the following paragraphs assess *Australe*'s defensive options with regard to the *Template*. This takes account of the customary *jus ad bellum* principles of necessity and proportionality. One could dismiss the need for autonomous decision making in this scenario because the flight time of the ballistic missile appears to provide ample time for there to be MHC over the decision to respond with force. To do this, however, would overlook the inherently autonomous nature of existing defence systems. Moreover, it would disregard the fact that one of the leading strategic reasons for advocating the use of AWS is that they can complete mission assigned to them where there is a complete loss of communication. The analysis, therefore, considers the backbone of the *Template* in light of L1AWS.

2.2.4.1 Intercepting a Ballistic Missile Attack with a L1 AWS.

The only realistic way to respond to a ballistic missile attack is to intercept it with another missile. And being a single use munition that is fired at either a single target or a range of targets, a missile is clearly a munition. Another way an autonomous anti-ballistic missile could be referred to is a homing munition, or a GPS guided bomb. As previously noted, certain commentators would identify this as semi-autonomous AWS.[419] Nonetheless, interceptor missiles provide a useful example of why this phrase

found to have acted unlawfully by intercepting a missile that was not targeting them but, for example, a neighbouring state that had not stated that they were under armed attack, nor had requested assistance.

[419] See e.g., The ICRC Report of the Expert Meeting: Autonomous Weapons Systems Technical, Military, Legal and Humanitarian Aspects (26-28 MARCH 2014) 14, which states that 'Semi-autonomous weapon systems…[is]…[a] weapon system that, once activated, is intended to only engage individual targets or specific target groups that have been selected by a human operator." Examples include 'homing' munitions that, once launched to a particular target location, search for and attack pre-programmed categories of targets (e.g., tanks) within the area'. See also, pp19 of the report which suggests that 'current examples…[of semi-autonomous weapons]…include homing munitions, unmanned aircraft with GPS-guided bombs, and intercontinental ballistic missiles.' Note also Scharre, *ibid*, n.20, 41. Here the author suggests GPS-guided weapons 'do not have any freedom to select their own targets or even their own navigational route'. See also pp.42, where the author also suggests that

is misleading. The following passage is a description of an Exoatmospheric Kill Vehicle (EKV) which is provided by the weapons manufacturer Raytheon,

> 'When the Ground-based Midcourse Defense System tracks a threat with its land, sea or space sensors, it launches a Ground-Based Interceptor, which uses its three-stage solid rocket booster to fly out of Earth's atmosphere at near-hypersonic speeds. Once it has exited the atmosphere, the kill vehicle's job begins…The EKV seeks out its target using multi-color sensors, a cutting-edge onboard computer and a rocket motor that helps it steer in space. It guides to the target and, with pinpoint precision, destroys it using nothing more than the force of a massive collision. No traditional warhead is necessary.'[420]

Contrary to arguments regarding supervised autonomy therefore, the EKV does have the freedom to select its own navigational route and can search and hunt for targets on its own.[421] Granted, it does so outside of the earth's atmosphere where there are very few distractions. Nevertheless, once initiated the EKV independently completes all four stages of the OODA loop. Therefore, it is a L1 AWS. While the EKV is only intended to target ICBMs in their midcourse phase, there are also other examples of existing autonomous MDS that operate in the terminal phase such as the PAC-3 missile. A NATO fact sheet provides that the PAC-3, can, with human oversight, track a ballistic missile and neutralize the threat.[422]

Its manufacture, Lockheed Martin, provides that the PAC-3 is the 'world's most advanced, capable and powerful terminal air defense missile.'[423] Similarly to the

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'homing munitions are also given very little autonomy,' and they do not 'search and hunt for targets on their own.'

[420] Kill Vehicles (Raytheon Missiles and Defense) https://www.raytheonmissilesanddefense.com/capabilities/products/kill-vehicles accessed 9 July 2021.

[421] Contrary to Scharre, *ibid,* n.419.

[422] See, Patriot [Fact Sheet], (*NATO*) < https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2012_12/20121204_121204-factsheet-patriot-en.pdf> accessed 17 December 2017.

[423] See, PAC-3 [Fact Sheet] (*Lockheed Martin*) , https://www.lockheedmartin.com/content/dam/lockheed-martin/mfc/pc/pac-3/mfc-pac-3-pc.pdf accessed 17 June 2020.

Phalanx systems previously discussed, the Patriot Missile Defence System - the platform that is responsible for launching the PAC-3 - has fully *automatic* capabilities. [424] If set in automatic mode, the Patriot can, though supervised, independently complete the four cycles of the OODA Loop.

The system is, therefore, another example of an existing AWS, and further evidence that defensive L1AWS have been routinely used for a number of years without controversary. The primary issue here, however, is that neither the EKV, nor the PAC-3 can operate in solitude. Instead, they must operate as part of a much broader weapons system. Therefore, while, prima facie, L1AWS can be used lawfully as method of interception, they generally need to be considered alongside a more advanced level of autonomy. Nevertheless, for current purposes L1AWS for defensive purposes (i.e., for interception) cannot be demonstrated as inherently unlawful. Thus, the following can be offered, with the obvious caveat being for this graphic and all other such associated graphics, subject to international law,

L1AWS	Defence [D]	Offense [O]
Lethal [L]		
Non-Lethal [N]	☑	

2.2.4.2 Intercepting a Ballistic Missile Attack with a L2 AWS.

This section considers the *jus ad bellum* implications of L2AWS deployments where for interceptive self-defence. As previously noted (1.3.4), interception is not only relevant in terms of an attack with an ICBM, or indeed in only under the *jus ad bellum*. Instead, when used in relation to the *Template*, interception refers to any act taken by

[424] The office of Director the Director, Operational and Rest Evaluation (DOT&E) (United States) says of the Patriot, 'The key features of the PATRIOT system are the multifunctional phased-array radar, track-via-missile guidance, and extensive modern software and automated operations, with the capability for human override. See, http://www.dote.osd.mil/pub/reports/FY2000/pdf/dod/00patriot.pdf accessed 23 August 2018.

an AWS in response to an attack that is underway,[425] but where the attacking weapons capability has not yet been realised.[426]

The previous section noted that an AWS such as an EKV is merely one element of a much wider system. Indeed, in much the same way as the discussion in Part 1, the weapons system which enables the deployment of an autonomous munition, is often an existing L2AWS. Platforms are, by their nature, particularly mobile. They may be fixed in position such as the Samsung armed sentry SRG-1 robot which deployed in the Korean Demilitarized zone (DMZ).[427] However, most will either be fixed to a larger platform (such as the Phalanx) or be capable of manoeuvring independently.

Where this is the case, it is vital that they are capable of distinguishing a lethal enemy munitions or platforms, from friendly platforms and/or civilian vessels such as passenger aircraft. In the past this has not always been the case, and primarily, this has been for two specific reasons. The first regards the concept of automation bias, and the second regards the concept of conformation bias. Both of which have previously led to human weapons operators making fatal errors of judgement.

Events of March 2003 provides a useful example of the former. On this day, a Patriot Air and Missile Defence System mistakenly identified a *friendly* Royal Air Force Tornado GR4A fighter jet as an enemy anti-radiation missile.[428] In this instance, even though the Patriot is designed only to intercept theatre ballistic missiles in their terminal phase, and not anti-radiation missiles, the Patriot operators were unaware, and they engaged the Tornado nonetheless. The aircraft was destroyed, and the pilots did not survive. Here, the operators simply believed the machine must be right—a 'perfect' yet ultimately tragic example of automation bias.

In direct contrast, conformation bias can be demonstrated by considering the following set of circumstances. At the height of the Iran-Iraq war on 3 July 1988, the USS Vincennes was positioned in the Persian Gulf. The Vincennes (which was already on

[425] Dinstein, *ibid*., n.254, paras. 606-614, Green, *ibid*, n.255, 107-108.
[426] Green, *ibid*, n.255, 107, refers to a situation where the attacking weapons 'injurious consequences have not yet occurred'. However, as per the present researchers general definition, a weapon does not necessarily have to apply a kinetic or destructive force.
[427] There is not a great deal of manufacture information available for the SGR-1. However, for a useful discussion, see e.g., Scharre, *ibid,* n.20, 104-105.
[428] For a more in-depth discussion also see, Scharre, *ibid*, n.20, 137-145.

high alert due to previous attacks on U.S. warships),[429] came into contact with a number of smaller Iranian military vessels. The two parties became involved in an exchange of fire. While the Vincennes crew were concentrating on this incident, the ships Aegis system identified two aircraft leaving an Iranian airfield. This airfield was used for both civilian and military purposes.[430] According to the Aegis, one of these aircraft was a civilian passenger jet Iran Air Flight 655, while the other was an Iranian F14 fighter jet.

The crew monitoring the two aircraft aboard the Vincennes made a mistake. They confused the two, and neglected to register the F-14 leaving the area.[431] They issued a number of warnings to what they believed was the F14, but what was in fact the passenger jet, on both military and civilian frequencies. There was no response. As a result, '[e]ven though the jet was squawking IFF and flying a commercial airline route,'[432] the captain of the US vessel gave the order to fire, and the aircraft was destroyed. A number of opponents of AWS use this incident to highlight the dangers of an overreliance on automation.[433] However, the opposite that is true. The Aegis was *not* at fault for the incident, but the humans-in-the-loop were.[434] If the Aegis was set to fully autonomous mode, the IFF beacon sent out by flight 655 would most likely have prevented the system from responding. In this instance, in the 'fog of war', technology may have saved 290 lives.

This contrasts the former example, where the accident did not occur because of conformation bias, but because of an overreliance upon the technology.[435] The Patriot system was not necessarily malfunctioning.[436] The problem was that through no fault of their own, the operators were not aware of the Patriots capabilities, and perhaps more

[429] For a useful discussion see, Scharre, *ibid*, n.20, 169-170.
[430] *Ibid.*
[431] See e.g., 'Conformation Bias' (Dictionary.com.) https://www.dictionary.com/browse/confirmation-bias accessed 9 July 2021 Here conformation bias is defined as 'bias that results from the tendency to process and analyze information in such a way that it supports one's preexisting ideas and convictions'.
[432] IFF is defined *ibid,* n.135. See also, Scharre, *ibid,* n.20, 170.
[433] See, HRW 2012, *ibid*, n.15, 12, HRW 2015, *ibid*, n.191, 29,
[434] See generally, Gregory P. Noone and Diana C. Noone, 'The Debate Over Autonomous Weapons Systems (2015) 47 Case W. Res. J. Int'l L. 25, Shane Harris, 'Autonomous Weapons and International Humanitarian Law, or, Killer Robots Are Here Get Used to It.' (2016) 30 Temp. Int'l & Comp. L.J. 77, 80-81, Schmitt, *ibid,* n.42.
[435] Scharre, *ibid,* n.20, 144 noting 'Army investigators determined the Patriot community had a culture of "trusting the system without question"'.
[436] *Ibid*, noting, '[i]t didn't break. It didn't blow a fuse. The system performed its function: It tracked incoming targets and, when authorized, shot them down.'

importantly, its limitations.[437] In the latter example, the problem was not automation bias, 'unwarranted and uncritical trust in automation', but conformation bias.[438] Both of which, it must be said, are inherently human traits.

Clearly, autonomous technology could have altered the outcome of both of these two scenarios in a number of different ways. Some positively, and some negatively - though it is unnecessary to attempt to introduce and analyse each at this stage. The point is, both will have ended differently if the human operators had received training that was better tailored towards the systems that they were using, and if they were supplied with sufficiently precise intel.[439]As a result, the following rules are annexed,

RULE 3
Training leading to an appropriate level of user knowledge must accompany every autonomous deployment.

In addition, where appropriate,[440]

RULE 4
AWS must be capable of receiving real-time multi-domain battlefield updates, and of acting accordingly.

Neither of these two rules are necessarily grounded in an existing legal obligation, but they are nevertheless key to the operation of *Template*, and the overall thesis analysis. This is possibly best demonstrated in Chapter Six, regarding accountability, but they feature throughout, not least, as an additional method of ensuring MHC accompanies all AWS deployments. Of course, although they are considered here under the auspices of L2AWS, they are applicable to all AWS deployments, regardless of *Template* classification.

[437] *Ibid.*
[438] See, n.438, *ibid*.
[439] Scharre, *ibid,* n.20, 137 stating the operators were using 'an unfamiliar set of equipment, they were supporting an unfamiliar unit, they didn't have the intel they needed'.
[440] There will almost certainly be tactical situations where AWS will be required to operate in 'radio silence', in order to avoid detection.

Continuing with the L2AWS analysis, there are certain unanswered questions concerning the customary obligations of necessity and proportionality. For example, there is no clarity as to the exact point in a ballistic missile's trajectory at which the principle of necessity satisfied. Necessity first requires that all non-forceful measures have been exhausted.[441] Next, a state must demonstrate that it would have been wholly unreasonable in the circumstances to expect the responding state to attempt non-forceful measures.[442] In other words, force must be the 'last resort'.[443]

In terms of the present analysis, one could argue that there would be no sense of *imminence* while the ballistic missiles are in the boost phase of their trajectory. *Orientale* could, for example, alter the missiles course. Nonetheless, this is not a matter that is limited to AWS. Moreover, both theatre MDS such as the Patriot (*ibid*), and strategic MDS such as the U.S. National Missile Defense system (NMD) have been used without controversy for many years which might demonstrate that custom has accepted their use.[444]

If, having satisfied last resort, *Australe* were to deploy a L2AWS in order to intercept a ballistic missile *jus ad bellum* proportionality would also be satisfied. This is because proportionality does not refer to an 'equivalence of scale and/or means between the attack being responded to and the response' as is the misconception,[445] but to 'to the need for the state to act in a manner that is proportional to the established defensive necessity.'[446] Some argue that AWS would have a disproportionately negative impact upon society in general.[447] Nevertheless, those discussions are firmly grounded in just

[441] Noting that arguably a state could potentially always try just one more time to prevent a course of action with dialogue rather than force.
[442] Green, *ibid,* n.255, 101.
[443] *Ibid.*
[444] The U.S. NMD (which refers to the entire MDS as opposed just to the Ground-Based deterrent) has been in operation for nearly two decades, see, Fact Sheet, 'Current U.S. Missile Defense Programmes at a Glance' (Arms Control Association, August 2019) https://www.armscontrol.org/factsheets/usmissiledefense accessed 15 June 2021. With regards to custom, see, Grimal, *ibid*, n.304, 331-334 where the author notes, 'in the strict legal sense…deploying states would need to 'deploy' MDS with strict belief that this is permissible within the law governing the recourse to self-defence'.
[445] Green, *ibid*, n.255, 101. Here the author refers in turn to, David Kretzmer, 'The Inherent Right of Self-Defence and Proportionality in Jus ad Bellum' (2013) 24 European Journal of International Law 235, 237, and notes that Kretzmer merely identifies this mistaken understanding of proportionality and does not subscribe to it.
[446] Green, *ibid*, n.255, 101.
[447] See e.g., Roff, *ibid,* n.293. Here, for example, the author argues if a State was to defend itself with the use of an AWS there would be no lethal threat to the AWS, hence a lethal response would be disproportionate.[447] In addition, she argues that the proportionality calculation must also consider the all

war theory (discussed in Chapter Five). [448] From a legal perspective, destroying an incoming ICBM would be a proportionate response.

Certain responses with L2AWS must therefore be seen as lawful. In scenario II, Article 51 restrictions have been met, and the customary principles satisfied. Nevertheless, it is true that not all armed attacks are the same. Some, more than others, may require a *more* forceful response. As a result, every autonomous response would need to take the principles of necessity and proportionality into account, in order to be lawfully permissible. This can only be done on a case-by-case basis. And, providing each response is able to satisfy all of the conditions that have been discussed, thus far, there is no justification for supporting the viewpoint that L2AWS cannot be used in self-defence, whether applying a non-lethal force, or a lethal force. The following is therefore introduced, with the same caveat as above,

L2AWS	Defence [D]	Offense [O]
Lethal [L]	☑	
Non-Lethal [N]	☑	

2.2.4.3 Intercepting a Ballistic Missile Attack with a L3 AWS.

The previous section identified that L2AWS do not uniquely exhibit characteristics that would make them problematic under the *jus ad bellum* when used as a method of intercepting an armed attack. This section focuses upon L3AWS, which as a reminder, are *command operating systems* that are capable of operational battle planning, and of

the negative costs, including the fact that the use of AWS to respond to an unjust use of force adversely effects the possibility for peaceful settlement. Given the context of scenario II, once the ballistic missiles are past the boost phase, peaceful settlement is not possible. For a similar discussion also see generally, Tamburrini, *ibid*, n.318.

[448] As a reminder the *jus ad bellum* principle of proportionality must be distinguished from the principle proportionality as considered under *just war theory* (even though just war theory is often referred to as the *jus ad bellum).* The point is, the latter is a theory that used to justify waging war (or not) wage, whereas *jus ad bellum* proportionality helps to determine the lawfulness of the recourse to force in self-defence. Just war theory, and consequently the two authors arguments (among others) are considered in greater detail in Chapter Five.

commanding other systems (including humans). At their core, L3AWS are artificial intelligence (AI) software programmes, rather than military hardware such a drone-ships and EKV's.

In reality, the software is the heart of any MDS, whether it be a terminal phase Patriot battery, or a more widely applicable GMD system. One reason for this, is that ballistic missiles travel at speeds far in excess of what humans can conceivably keep up with.[449] As a result, it is the operating system (the software), that identifies, tracks and engages ballistic targets. Humans, in fact, have very little input other than overseeing the decision to use force.[450] This is one reason why AWS classified as L3 are so controversial. Clearly, while outside of the earth's atmosphere there are limited opportunities for things to go too wrong, the same cannot be said, for example, for a L3AWS delegated decision-making responsibilities regarding the movements of a large-scale military operation on a constantly evolving battlefield. The latter is discussed further in the following chapter. For present purposes, the following graphic provides a useful overview of the autonomous nature of the U.S. MDS.

[449] See, Grimal, *ibid*, n.304 , 320, stating '[a]n incoming missile travelling at Mach 5 can be detected by the Patriot system at a range of 50 miles – and impossible feat for human beings.

[450] See e.g., 'Ground-Based Midcourse Defense Fire Control and Communications' (*Northrop Grumman*), <https://www.northropgrumman.com/space/ground-based-midcourse-defense-fire-control-and-communications-gmd-fcc/ >accessed 17 June 2020. This states the GMD 'accepts data from multiple space, maritime and ground sensors to fully identify the threat, plans the best defensive solution, launches the interceptor to engage the threat object, and intercepts and destroys the inbound threat through force of hit-to-kill technology.'

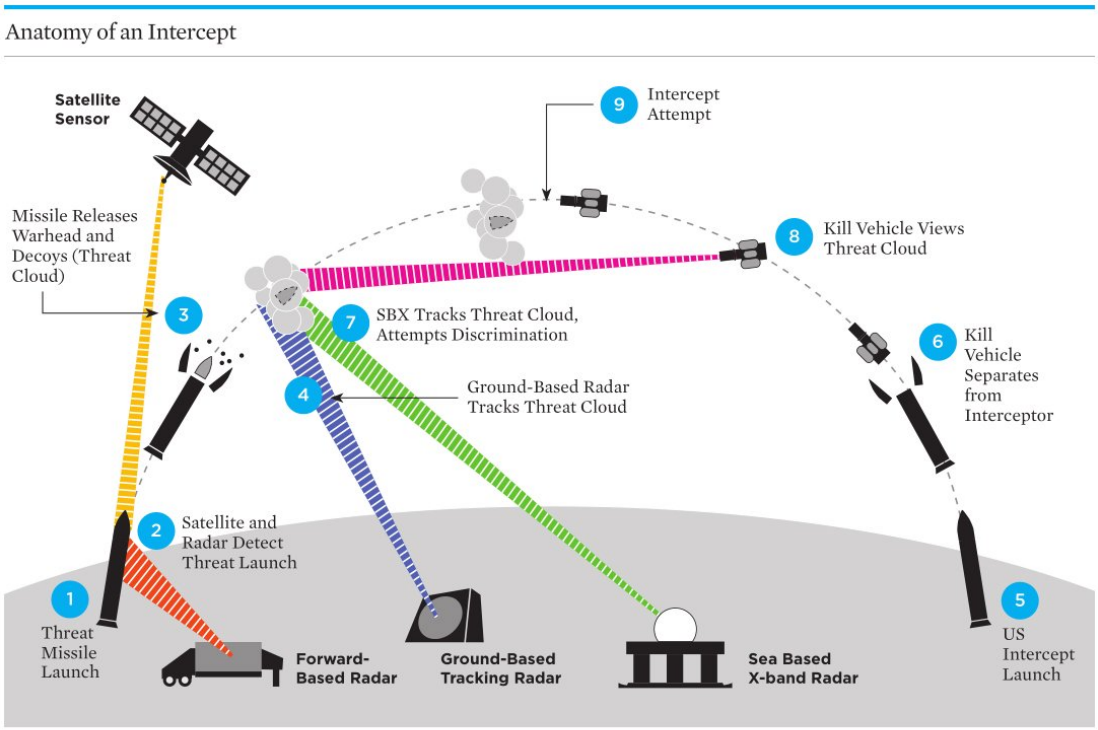

Figure 15: Elements of the GMD, and the anatomy of an intercept.[451]

Figure 6 is a graphical representation of this discussion. And, with a particular reference upon the U.S. GMD, it shows that when taken in its entirety, the system is comprised of various elements including the software which is tasked with independently monitoring and directing both platforms and munitions. The point here is that if the entire system was fully autonomous, it would operate as a L3AWS. In this instance, a further analysis is not necessary in terms of intercepting an armed attack, because exactly the same set of guidelines would apply as they did in the last analysis.

Orientale could find a way of coincidingly incapacitating *Australe's* GMD communications network, either through physical destruction, a cyber-attack or a combination of both. Given such circumstances, it would surely be nonsensical to suggest that *Australe* should be prevented from protecting its populace, due to the

[451] Image from, Arms Control Association, 'Missile Defence Systems at a Glance' (Arms Control Association, August 2019) < https://www.armscontrol.org/factsheets/missiledefenseataglance#c&c> accessed 17 June 2020. [Key to acronyms used on diagram, GMD Fire Control (GFC), Command Launch Equipment (CLE), Launch Support Systems (LSS), GMD Communications Network (GCN), and the In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT)].

premise that the decision to intercept a ballistic missile was pre-programmed by a human, as opposed to being given by a human overseeing a machine that was operating at speeds in excess of human capabilities. Indeed, when viewed holistically, there is no lawful reason states should not be permitted to use a L3AWS to defend against a potentially catastrophic armed attack where it satisfies Article 51 UN Charter, and where the *jus ad bellum* principles of necessity and proportionality are also satisfied. And, as noted in the previous section, this must, subject to existing legal obligations, be the case whether applying a lethal or non-lethal force. In other words, L3AWS cannot be identified as inherently unlawful. This can be demonstrated as follows,

L3AWS	Defence [D]	Offense [O]
Lethal [L]	☑	
Non-Lethal [N]	☑	

2.2.4.4 Intercepting a Ballistic Missile Attack with a L4 AWS.

The purpose of this section is not, as may appear to be the logical progression, to consider the lawfulness of a L4AWS to intercept the armed attack identified in scenario II. Instead, it is to highlight the fact there is actually no need for such an examination. The reason for this is simply that a human would need to have authorised the deployment of the MDS in question, or, at the very least, would have needed to have authorised the continued use the L3AWS considered above.[452] In other words, where an MDS, and/or other strategic defensive systems are in place, there is no requirement for autonomous strategic decision making. This is because human authorization can be implied from the very fact that the autonomous L3 MDS exists. Thus, the general principle from RULE 1 remains intact, and strategic level decision making remains an inherently human domain.

[452] In this respect the existence of L3 autonomous defensive systems implies strategic (L4) authorization has been given. Lack of knowledge of an antecedent autonomous L3 system such as an MDS is not a defence. In reality, it is, of course, very unlikely that any head of State or leader of any other such entity would not be furnished with the knowledge that such a system exists.

With that said, the ICJ have refused to rule out the lawful use of nuclear weapons in extreme circumstance of self-defence, in which the very survival of a State would be at stake.[453] This is the case despite the utterly destructive nature of nuclear weapons, and the fact that they are incapable of distinguishing between legitimate military targets and civilians and civilian objects.[454] And, there is no reason to suggest that the same logic would not be applied to AWS, where the very survival of the state is at risk.[455] Consequently, in order to intercept an attack, there may be no valid reason under the inherent right to prevent a state uses all resources at it fingertips, including L3 & L4 fully-networked AWS.

Although it may seem somewhat contradictory, however, the survival of the state scenario is one that would need to be considered in isolation, by an appropriate human decision-maker. And the general rule which must be drawn out from this analysis, however short, is that RULE 1 ensures AWS are prevented from operating strategically. Thus,

L4AWS	Defence [D]	Offense [O]
Lethal [L]		
Non-Lethal [N]		

2.2.5 Abating an armed attack with AWS.

The previous section examined whether the use of AWS to *intercept* an armed attack was in breach of Article 51 UN Charter, or *jus ad bellum* necessity and proportionality. In contrast, the following section considers the lawfulness of abating an armed attack with the use of AWS. As noted above (2.2), that the acts of abating and repelling/ intercepting are typically considered as one in the same. However, for present purposes, abating is conceptually distinguished from interception (which is an attack that is already underway). Therefore, where the following analysis refers to abating an attack,

[453] *Nuclear Weapons Advisory Opinion, ibid,* n. 73 para. 97.
[454] Distinction is an International Humanitarian Law (IHL) principle and is therefore considered in greater detail in the following chapter.
[455] Noting that *jus ad bellum* necessity does not require for this to be the case.

it means an act to limit an aggressor's ability to launch *further* attacks by incapacitating its underlying weapons infrastructure.

This might be the 'ultimate goal' for any state forced to respond to an armed attack, and arguably it is the act by which the proportionality assessment should be judged.[456] Somewhat importantly, abating an attack will often mean authorizing the use of force extraterritorially, and often at ground zero. As a result, humans (both combatants and civilians) may be in a much graver danger of being affected by the response. The remainder of this section once again considers the four levels of autonomy that are identified upon the backbone of the *Template*, with the additional enquiry into whether or not in the case of an autonomous abating of an armed attack, international law recognises a difference between lethal and non-lethal responses.

As a reminder the relevant information that was provided in Scenario II with regard to abating further attacks is that State *Australe's* AEW&C has identified that ICBMs were launched from within Orientale's territory, as well as medium range 'theatre' ballistic missiles launched from Orientale's naval vessels. Indeed, there is no question that *Australe* is suffering an armed attack, or that intercepting the ballistic missiles is a lawful act. However, because action taken to abate a further armed attack will ultimately involve destroying an aggressor's ability to launch another weapon or weapons, it is not strictly re-active in nature. In short, the *Template* considers this type of act to be pro-active in nature, and thus an act to abate is classified as an offensive [O] act.

Crucially, with the above in mind, the imminence that was present with regards to neutralizing the ballistic missiles threat in the last examination is lacking. Moreover, the combination of authorizing an extraterritorial use of offensive force in lieu of certain imminence must be seen to be a strategic, rather than operational decision. Consequently, the following analysis relates solely to a human authorization of each class of AWS

[456] See e.g., Douglas Guilfoyle, 'The Gulf of Tonkin Incident-1964' in Tom Ruys, Oliver Corten and Alexandra Hofer (eds.) *The Use of Force in International Law*, 116. Here the author highlights the existing debate as to whether the *jus ad bellum* principle of proportionality should relate to force used in the original armed attack (the quantitive view), or, to the force necessary to abate further attacks (the functional view). The author in turn cites, James A Green, *The International Court of Justice and Self-Defence in International Law* (Hart 2009), 88-89.

2.2.5.2 Abating an Armed-Attack with a L1AWS.

Scenario II does not provide granular detail regarding the precise locations of *Orientale's* missile silos or their naval vessels. However, where a *Australe* human commander oversees and authorises the deployment of a L1AWS in order to prevent further attacks, it is them who must carry out the necessary legal assessments. Where, for example, that commander is furnished with sufficient intelligence, i.e., the number of *Orientale* vessels, and the potential number of ballistic missiles located on each, they may, for example, lawfully decide to respond with an anti-ship missile to prevent further launches.

A L1AWS could then, for example, be directed to the location where Orientale's naval vessels were known to be positioned. And, only then, being furnished with its own sensors, will the missile 'autonomously search for and identify adversary warships, while sorting out civilian, friendly or low-priority enemy vessels…[before homing]…in on its target without external direction'[457] One might think that weapons capable of such feats are only present in science fiction movies. The previous citation, however, refers to an existing, albeit, cutting edge, weapons system.

The weapon in question is Lockheed Martin's Long Range Anti-Ship Missile (LRASM), which the manufacturer claims 'provides range, survivability, and lethality that no other current system provides'.[458] Although highly advanced, there is arguably a sufficient amount of MHC in this instance, given that the human commander needs to directly authorise each use. It may even be that weapons such as the LRASM save human lives because it is programmed to attack priority targets, where the commander might otherwise be lawfully permitted to engage the entire *Orientale* fleet.[459]

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[457] Sebastien Roblin 'The Navy's New LRASM Missile Is a Direct Challenge To China' (*The National Interest,* 17 April 2020). https://nationalinterest.org/blog/buzz/navys-new-lrasm-missile-direct-challenge-china-145142 accessed 9 July 2021.

[458] Long Range Anti-Ship Missile (LRSAM), (*Lockheed Martin*)< https://www.lockheedmartin.com/en-us/products/long-range-anti-ship-missile.html> accessed 23 June 2020.

[459] Providing, for example, attacking the fleet was of course action that was considered a proportionate response. See, Guilfoyle, *ibid*, n.456, regarding the quantitive and functional views on *jus ad bellum* proportionality.

Figure 16: Lockheed Martin's next generation Long Range Anti-Ship Missile (LRSAM)[460]

Nonetheless, when it comes to abating an attack there are many variables to consider. And the programmers of the most advanced technology cannot possibly predict every possible outcome in advance. In short, there are many ways in which Clausewitzian 'friction' can lead to unexpected results in the 'fog of war'.[461] If an AWS were to miscalculate and apply these variables, particularly if it were capable of executing strategic level decisions, it could have catastrophic repercussions for wider international peace and security.[462]

It is arguable therefore that there *will* often be a moment of deliberation, however slight, where the commander can consider his or her options. They may, for example, with reference to intel collected from radar, satellites, ground forces, autonomous navy vessels, non-armed swarming reconnaissance UAVs, submarines, cyber-intel and all other methods of intelligence collection, have several options open to them. And, if in the meantime the worst-case scenario happens e.g., *Orientale* launches another attack, *Australe* is still able to use all the resources available to it to repel a second wave.

[460] Image taken from National Interest report, *ibid*, n.457.
[461] As noted by the present author elsewhere, Clausewitzian 'frictions' are what distinguish real war from war 'on paper'. See e.g., Grimal and Pollard, *ibid,* n.4, 673-674.
[462] This not only relates to the immediate consequences the following a disproportionate or in some other way unlawful or unwanted application of force, but also to the geopolitical repossessions which may be especially volatile should there appear to be lack of human judgement and accountability. (Note that Chapter Six deals with the issue of legal accountability of AWS.).

Nevertheless, exactly the same discussion would apply to the decision to a response with force against a missile silo located within *Orentale's* territory, particularly in regard of the proportionality calculation. Therefore, so long as there is MHC in the decision to use a L1 AWS, there is no reason it should not be used in order to act under an inherent right to self-defence.

As the author has argued elsewhere, the introduction of increasingly autonomous weapons may allow for the weapon itself to conduct an additional proportionality assessment. [463] This could be carried by the munition itself. And should the commanders' original proportionality assessment be negatively affected in the period following launch, the munition may be capable of altering course, self-destructing, or perhaps even returning to a safe location. This is a way that autonomy can ensure that international norms concerning the use of force are adhered to. However, AWS classified upon the Template as L1AWS, can potentially be deployed to abate an attack because they cannot be demonstrated as inherently unlawful. Thus,

L1AWS	Defence [D]	Offense [O]
Lethal [L]	☑	☑
Non-Lethal [N]	☑	☑

2.2.5.3 Abating an Armed-Attack with a L2 AWS.

The reader will recall the researcher's statement that a munition is only as effective as the weapons system that encapsulates it. The platform that currently houses the LRSAM is a manned one. This means that the LRSAM operates autonomously as a munition only. [464] Nevertheless, as discussed in Chapter One, the bombers and fighter

[463] See generally, Grimal and Pollard, *ibid,* n.4.
[464] The LRSAM is still in the testing phase. However, it has already been launched from a F-18 'Super Hornet' fighter jet. Having received additional funding in 2019, it is also set to be integrated onto bombers such as the B52 and the new P8-A Poseidon. See e.g., Xavier Vavasseur, 'Lockheed Martin, NAVAIR and the U.S. Air Force will start working on the integration of LRASM on the B-52 following a budget allocation in FY 2019' (*Naval News,* 05 Nov 2019) < https://www.navalnews.com/naval-news/2019/11/lrasm-gets-funding-for-b-52-integration-could-find-its-way-to-the-p-8a-eventually/> accessed 23 June 2020. Note also that Israeli manufacturer Rafael, has also introduced a similar weapon,

jets of the future will at the very least be unmanned systems, with certain autonomous features, and/ or capabilities. The two primary differences between a munition and a platform, manned or otherwise, is that (i) a platform is recoverable – it being the structure from which a destructive munition is lunched, and (ii) a platform can spend a potentially unrestricted period of time carrying out the first two or three phases of the OODA loop.[465]

This is vital when analysing the lawfulness of the use of a L2AWS to abate an attack. For example, consider the following examples. First, a human commander deploys a L2AWS armed with a L1 munition (autonomous or otherwise), in the same circumstances as considered above. Here, in much the same way as deploying a LRSAM, the commander is responding to an imminent armed attack against an aggressor, who has both the means to launch an attack, and that has communicated its intention to launch an attack.[466] Under such circumstances, *just ad bellum* necessity is very likely to have be satisfied, and the destruction of Orientale's naval vessel(s) would also likely be considered proportionate.

On the other hand, following the initial ballistic missile attack, a commander could also launch a squadron of L2AWS from a carrier, and send a communication to a number of other vessels operating in various locations.[467] Here, the instruction given to all autonomous systems might be: locate and engage all *Orientale* naval capabilities. In this latter instance, however, it is unlikely that *all* of *Orietnale's* naval capabilities would be legitimate targets. A number of vessels may, for example, be docked. And it

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the 'Sea-Breaker'. See e.g., Tamir Eshel, 'Rafael Positions Sea Breaker as a Multi-Domain, Counter A2AD Cruise Missile ' (*Defense-Update*, 30 June 2021) https://defense-update.com/20210630_sea-breaker.html accessed 9 July 2021.

[465] Loitering drone munitions provide a limited exception. Israel's Harop drone, for example, can stay in the air for several hours. See, 'Israel Unveils "Harop" loitering Anti-missile drone' (Defense-Update, 10 January 2009) https://defense-update.com/20090110_harop.html accessed 9 July 2021. However, these types of munitions cannot refuel in mid-air, and are not currently powered by solar energy. Its range is not infinite, and once its fuel is spent it cannot return to base. It merely 'homes in' for example, to an enemy RADAR signal.

[466] See, Grimal, *ibid*, n. 304, 336. Here the author notes that strategy has a part to play because where there is a threat of force - but the potential aggressor clearly does not have the means to carry out that threat - it would be considered an empty threat and is therefore one which may be tolerated. In short, the threat must be credible. Also see, *ibid,* n.326. In the current scenario, the launch of the first wave of ballistic missiles clearly provides sufficient evidence in the positive.

[467] Here the author imagines a platform such as Horowitz's extraterritorial hunter killer drone that is capable of circling the globe looking for specific individuals that fall into the into a certain category. See, Horowitz, *ibid*, n.196, 27.

is also possible that other vessels could be engaged in non-combat activities such as anti-piracy patrols, and humanitarian aid support.

In other words, while an *Australe* commander in this situation may believe that there is a necessity to act in order to abate further attacks, it is clearly not necessary to engage all of Orientale's naval assets to prevent the attack occurring. Wiping out the entire fleet might also be considered a disproportionate response, not to mention the fact that civilians may be onboard either of the vessels carrying out non-combat functions.

An act to abate a further attack is an act that is taken against at threat of force, as opposed to actual force. The former of these two hypotheticals would, therefore, most likely satisfy the principles stemming from the *Caroline* incident, it being considered an act of anticipatory self-defence. However, the later would be more closely related to the concept of pre-emptive self-defence, which, as previously noted, has gained no comprehensive legal traction.[468] As a result the following rule is annexed,

RULE 5
L2 AWS should only be deployed to abate an armed-attack, where the human commander has authorised a specific target, or group of targets, having confirmed with intelligence that it/they provide(s) a sufficiently grave threat.

With RULE 5 in mind, and to demonstrate how this affects the operation of the *Template*, the following can also be introduced,

[468] Dinstein, *ibid,* n.254, paras. 608-610. The author imagines the U.S. were aware of the impending attack on Pearl Harbour and offers three potential courses of action. In the first, the Americans shoot down the incoming Japanese aircraft before they reach Peral Harbour. Dinstein identifies that although a shot has not been fired, the Americans have the right to believe that they are under armed-attack. Therefore, a response, to intercept the Japanese aircraft is a lawful response. In Dinstein's, more problematic, second scenario he considers whether the U.S. could lawfully have intercepted the Japanese fleet before the pilots left. While, for reasons previously discussed, anticipatory self-defence is problematic, Dinstein notes that in order for this response to be possible, the U.S. would need to be furnished with solid intelligence that the attack was 'imminent'. If that was the case, then he suggests that there is no reason that they could not engage the Japanese fleet at this point. This act would, therefore, be considered anticipatory self-defence. In the third instance, Dinstein imagines the Americans destroying the Japanese fleet before it left port, or, for example, where it was engaged in ta raining exercise. The author notes that this would be an act of pre-emptive self-defence that is unlawful, and that there are certain activities that simply cannot cross the threshold to be considered an armed-attack. See also, generally, Grimal, *ibid*, n.304, who also refers to, and applies, these three examples throughout his analysis.

L2AWS	Defence [D]	Offense [O]
Lethal [L]	☑	☑
Non-Lethal [N]	☑	☑

2.2.5.4 Abating an Armed-Attack with a L3 AWS.

The above analysis has identified that human decision making must play a central role in responding with a kinetic force in order to abate an armed attack.[469] This means that, in taking such actions, a L3AWS must not be utilised as an operating system to battle plan and direct other systems autonomously. Indeed, this is central to the proposition that MDS should not be capable of acting outside of the immediate threat.[470] There is a question, however, as to whether a L3AWS should be permitted to prevent a further attack by applying a non-lethal force.

For example, an *Australe* L3 AWS operating at a speed far in excess of human capability, may respond by launching an advanced cyber-weapon. Such a system could potentially, [471] ensure national security by incapacitating *Orientale's* military infrastructure, either permanently or temporarily.[472] In addition, if *Australe* had access to an electromagnet pulse weapon (EPW), for example, it could be used as a method

[469] Where the researcher identifies that a lethal force should be permitted, it is generally assumed that non-lethal force is also implicitly permitted .
[470] See e.g., Grimal, *ibid,* n.304, 339, Here the author states that (due to issues with how such systems could ever be calibrated in terms of anticipatory/ pre-emptive self-defence etc.), it is questionable whether a fully autonomous MDS could ever operate within the existing self-defence parameters. [Note that the author refers to automatic as opposed to autonomous, but the principle that the machine is 'devoid of human involvement' is, nevertheless, the same].
[471] Presently, it is very unlikely that a national could instantly gain access to a adversaries cyber system in order to incapacitate it. Instead, a cyber-attack would typically be several months in the making, and without certainty that it would ever be successful. Any nation, or agent thereof, that developed and produced a highly sophisticated autonomous cyber-weapon that was capable of hacking into an adversaries system instantaneously, would certainly be at a considerable advantage.
[472] Note that the Tallinn Manual, *ibid,* n.143, Rule 41 para. 2 does provide that a Cyber-attack may itself fall within the definition of force that is contained with Art 2(4) UN Charter. See also, Grimal & Sundaram, *ibid,* n.296, 1-2. The point here is, cyber-attacks do not necessarily mean that individuals, or even objects, will *not* be damaged as a result of their deployment.

of 'destroying electrical systems without the collateral damage often associated with traditional firepower'.[473]

The concept of responding in self-defence with the use of these emerging technologies is an area that is need of further analysis.[474] However, for the sake of the current discussion, it is arguable that if the benefits of such weapons could be utilised without harming individuals or property their use would be, prima facie, be lawful. This is because, *Australe* may, even if only limited circumstances, be able to demonstrate that this method of attack was both necessary, and that this response was proportionate. Therefore,

RULE 6
The use of L3AWS O/L are prohibited under the *jus ad bellum*. But, the use of L3AWS O/N is permitted, subject to existing legal provisions, not least, *jus ad bellum* necessity and proportionality.

With RULE 6 in mind the following is added in order to demonstrate *Template* applicability,

L3AWS	Defence [D]	Offense [O]
Lethal [L]	☑	
Non-Lethal [N]	☑	☑

[473] See, Lulu Chang, 'U.S. Air Force confirms Boeing's electromagnetic pulse weapon' (Digital Trends, 26 May 2015) < https://www.digitaltrends.com/cool-tech/us-air-force-confirms-boeings-electromagnetic-pulse-weapon/ > accessed 9 July 2021. Also see, 'CHAMP -Lights out' (Boeing) < https://www.boeing.com/features/2012/10/bds-champ-10-22-12.page > accessed 9 July 2021. Here, Boeing claim that a in 2012 test, their CHAMP weapons system successfully defeated electronic targets with little or no collateral damage.

[474] There is a substantial amount of literature with regards to cyber-weapons, but it is largely to do with whether the use of such a weapon would constitute an armed attack, see e.g., Grimal and Sundaram, *ibid*, n.296. There is no need to carry out an in-depth analysis here because the current enquiry is not directly related to these two types of weapons, but rather the hypothetical situation where an autonomous operating system deploys them.

This rule is applicable in two further ways. The first is in relation to the previous situation in which the commander deploys a L2AWS, and the second is in relation to where a commander deploys a swarming L3AWS. A swarm is a L3AWS because, at its heart, the 'individual elements' require an operating system for it to function as a 'whole'. Without it, a swarm would merely be a collection of L2 platforms, or L1 munitions - without a common purpose. While the previous discussion considered a L3 system prior to human authorization, swarms can provide an opportunity for a commander to authorise a use of force to abate an armed attack.

Nevertheless, the same principles that have been developed thus far, must apply with regards to swarms. As a result, firstly, and for exactly the same reasons as considered above, a L3AWS should only be deployed to abate an armed attack where the human commander has authorised a specific target, or group of targets, having confirmed with intelligence that it/ they constitute(s) a sufficiently grave threat. Therefore, the following rule is attached,

RULE 7
Where they exist, a commander may deploy either a L1 AWS, L2AWS, and/ or L3AWS that is designed to apply a non-lethal force against an unspecified target, providing such an act is consistent with the *jus ad bellum* principles of necessity and proportionality.

2.2.5.5 Abating an Armed-Attack with a L4 AWS.

The previous analysis considered the circumstances in which a state may invoke their inherent right to self-defence by utilizing an AWS to intercept an armed attack. It concluded that in such an instance, the very existence of the L3AWS implied that the L4 strategic decision had already been taken by a human. As a result, in the section that considered intercepting an armed attack, it was not necessary to consider L4AWS.

A question is, however, does the same principle apply to abating an armed attack? The primary difficulty, if one was trying to reconcile the two, is this: In the previous discussion an AWS was deployed to defend a specific 'friendly' territory against a specific threat. For example, the previous discussion implied an AWS such as an autonomous GMD could be used for protecting a nation from a nuclear missile attack.

In addition, and similarly, a Patriot (on fully automatic mode) might be used to protect a smaller geographic region from a theatre ballistic missile strike. And an AWS might also be fixed to a naval vessel to protect against anti-ship missiles and attack aircraft (as is the case with the Phalanx system). However, in each case, the AWS is acting to defend a pre-defined, and relatively uncontested space.[475]

In contrast, a state could utilise a L4AWS to abate an attack in a number of ways. For example, one method of utilising a L4AWS would be to deploy a platform, or swarm, with a vastly superior range of potential actions than that which was delegated - by the commander - to the L2 AWS in the discussion above. In that discussion the commander issued the order, *locate and engage any State (B) naval capability that is encountered*. However, one major concern of those opposed to AWS is the hunter killer drone, as offered, for example, by Horowitz and Scharre amongst others.[476] Such a drone, it is feared, could be pre-programmed with information regarding targets, whether they be individuals, or military software and hardware.

Potentially, the hunter killer drone could encircle the globe, perhaps for extended periods of time, without any communication with a human in the command-and-control centre. It could merely search for targets according to any number of pre-determined criteria and engage and destroy them as it came across them (thus completing all four phases of the OODA loop). In such an instance, even though authority would need to be given to deploy, or at least to continue use such a weapon, this is conceptually very different from an MDS of other defensive system that operates according to imminence, amongst other legal principles.

Instead, the hunter killer drone is a L4, thus, a strategic AWS that chooses when, where, and who/ what it attacks. It can do so without human input, other than that which was uploaded during programming. There are a number of reasons, however, why the Template will ensure that do not resort to using such weapons, not least because as Rule 1 establishes that strategy is and must remain an inherently human affair.

[475] Even if the uncontested space -such as a ship – was placed within a larger uncontested environment.
[476] See sources, *ibid,* n.207. Also see e.g., Paul Scharre and Michael C Horowitz, 'An Introduction to Autonomy in Weapons Systems' (CNAS, 2015), 15 https://www.cnas.org/publications/reports/an-introduction-to-autonomy-in-weapon-systems accessed 9 July 2021.

Extraterritorial applications of force, whether kinetic, or non-kinetic, lethal or non-lethal must not, therefore, be made autonomously.

This must be the case whether one can identify an implied authority or not. This is not, however, merely due to a theoretical perspective. Instead, it is solidly backed up by wide opposition to the concept of pre-emptive self-defence which is where the deployment of such a weapon would undoubtably sit (if, indeed, it did not create an ever wider defensive category of its own, such as pre-cautionary self-defence). In other words,

RULE 8
L4 AWS must not be utilised to abate future armed-attacks.

Clearly, another way of presenting this is as follows,

L4AWS	Defence [D]	Offense [O]
Lethal [L]		
Non-Lethal [N]		

2.2.5.6 Invoking the Inherent Right to Self-Defence with the use of AWS: In sum.

While the UN Charter makes every effort to prevent States from waging war by prohibiting the use of force, Article 51 provides one of two codified exceptions. Two essential components of the normative framework of self-defence are customary in nature. Thus, the *jus ad bellum* principles of necessity and proportionality are binding upon all parties. In the first instance, an autonomous action would be a reactive response, and, thus, a defensive act. Here, the investigation demonstrated that there is no lawful reason to prohibit the three levels of autonomy, L1, L2, and L3AWS. An investigation into L4 was unnecessary, due to the fact that L4 decision making, even only if by implication, was made by a human. In contrast, an act to abate a further

attack, does not react to armed-attack, but is taken to prevent an armed-attack. As a result, the investigation here was conducted upon the offensive axis.

This examination identified that, providing their use was authorised by a human commander, a L1 and L2 AWS could be used to apply a kinetic, and a non-kinetic force to a predetermined target or group of targets, and a L3 AWS could apply a non-kinetic force to a target or targets not previously identified by a human. However, in this instance, L4 authority could not be implied, for either the application of kinetic or non-kinetic force, not least due to the fact that such weapons operate almost entirely in the realm of pre-emptive self-defence. Consequently, the *Template* supports the prohibition of this category of AWS.

Part 3: Autonomous Weapons Systems and Intervention.

Part 3 considers the AWS alongside humanitarian intervention (HI). In this final analysis the researcher does not intend to conduct an encyclopaedic examination of AWS and HI. Rather, this section is used to identify those *jus ad bellum* concerns that have not already been considered. This section does not, therefore, go to great lengths to ensure the reader is familiar with complex legal concepts. Instead, the examination merely represents a platform for identifying any additional consequences of either allowing or prohibiting AWS deployments. Consequently, first this section briefly offers an explanation as to what HI is. And, second it conducts an analysis as to whether states should be prevented from deploying AWS for the purpose of HI.

2.3.2 What is Humanitarian Intervention?

Humanitarian intervention is a relatively recent concept which is inextricably linked with International Human Rights Law (IHRL).[477] Indeed, its primary purpose is to try and secure the rights of individuals who have been oppressed and/ or persecuted by their own governments.[478] This may include, for example, instances where the state has committed genocide against its own peoples.[479] In short, HI is similar to just war theory (considered in Chapter Five), in that it is intended to be for 'the greater good'.[480]

[477] Dinstein, *ibid,* n.254, paras. 205-209.
[478] *Ibid.*
[479] Noting, Art. I Genocide Convention, *ibid,* n.14, identifies Genocide is an international crime.
[480] Dinstein, *ibid*, n.254, paras. 205-209.

Unilateral humanitarian intervention is, however, generally considered to be unlawful.[481] And, 'no State acting alone (or even jointly with like-minded allies) has a legal option of resorting to force against another state'.[482] If they were to use force, it would breach Article 2(4) UN Charter. As a result, in the first instance, states must be prohibited from deploying AWS for the purposes of HI. There are, however, two *potential* exceptions. The first is where intervention is authorised by the UNSC, and the second where a nation acts under the agreement recognising the Responsibility to Protect (R2P).

Chapter VII of the UN Charter provides the UNSC with 'far reaching powers'.[483] And one way the UNSC may choose to use those powers is to authorise a use of force, as per Article 42 UN Charter, in response to humanitarian crisis. In short, if this was the case, the UNSC is not in a position to act itself, but rather it calls upon Member States to 'take such action by air, sea or land forces as may be necessary to maintain or restore international peace and security'.[484]

A possible second interventionalist exception R2P. However, unlike those exceptions to 2(4) UN Charter previously considered, R2P is not grounded within the treaties. It is a soft law human rights instrument, [485] grounded in a political declaration or ideology that was agreed by the Heads of State of all UN Member States. At its heart, R2P attempts to bind the contracting parties to an agreement to protect vulnerable global citizens from acts of genocide, war crimes, ethnic cleansing, and crimes against humanity. [486]

R2P attempts to offer an alternative exception to the UN Charter prohibition on the use of force for two fundamental reasons. The first is that an Article 51 only recognises the

[481] This is primarily because art. 51 requires for force to be used in 'self' defence. In other words, even where force is used with good intentions, it can still breach the art. 2(4) prohibition where it is not properly authorised. See Dinstein, *ibid*, n.254, paras. 205-209, and 540-541.
[482] Dinstein, *ibid,* n.254, para 209.
[483] Specifically, art. 39 gives the UNSC the ability to determine that *any* set of circumstances is in breach of peace and security. See e.g., Terry D Gill and Kinga Tibori-Szabo, 'The Intervention in Somalia-1992-95' in Tom Ruys and Oliver Corten with Alexander Hofer (eds), *The Use of Force in International Law: A Case Based Approach* (OUP 2018), 489.
[484] Art. 42 UN Charter, *ibid,* n.143.
[485] While Chapter Four considers AWS in relation to International Human Right law, the discussion is best placed here due to the fact that R2P is, at least *prima facie*, a *bona fide* exception to the international prohibition on the threat or use of force.
[486] It should be noted that the Genocide Convention, *ibid*, n.14 confirms that whether it is committed in a time of peace, or in time of war, Genocide is a crime under international law. This is discussed further in Chapter Four.

concept of collective self-defence if the victim State is a High Contracting Party.[487] Significantly, this requirement is not necessary for an action taken under R2P.[488] While the second difference under R2P is that there is no need for a 'victim State' to request assistance. This is core to the concept, because R2P is intervention, as opposed to support.

In other words, R2P seeks to protect the citizen's fundamental rights, over and above State sovereignty. As previously noted, this may be necessary for example, when a head of state/ acting head of state/ *de facto* head of state acts as aggressor against their own citizens.[489] R2P is potentially broader in scope than UNSC authorization because UNSC authorization is not a pre-requisite condition of acts taken in furtherance of R2P. In additionR2P might also be pursued and/ or sought by nations not party to the UN Charter.[490] Nevertheless R2P is particularly controversial. This is, not least, due to the clear contradiction with Article 2(4). Resolving the conflict is beyond the remit of the current research aims. However, the view of the present researcher is that being a soft-law agreement only, R2P is unlawful where force is used, and it has not been authorised by the UNSC. This must be the case, regardless of whether states are acting 'under the guise of securing the implementation of human rights'.[491] The Analysis which follows refers only to HI. In each case, this always refers to a UNSC authorisation, but could also refer to R2P (where authorised).

[487] The full text of Art. 51 UN Charter, *ibid*, n.143 reads: 'Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security'.

[488] Noticeable exclusions from the UN Charter, *ibid,* n.143 are Taiwan, Palestine (observer status), Holy See (observer status) and Northern Cyprus. However, there are also a number of dependencies.

[489] While R2P may, prima facie sound like a positive ideology, it is undoubtably a controversial proposition. This is not least because it appears to be at odds with the centuries old concept of statehood and the political and territorial independence that is protected by Article 2(4).

[490] For useful discussions see e.g., Birsen Erdogan*, Humanitarian Intervention and Responsibility to Protect* (Palgrave Pivot, 2017), and, James Patterson, *Humanitarian Intervention and the Responsibility to Protect: Who Should Intervene?* (OUP 2012).

[491] Dinstein, *ibid,* n.254, paras. 2-5, in turn citing, T. M. Franck and N. S. Rodley, 'After Bangladesh: The Law of Humanitarian Intervention by Military Force' (1973) 67 American Journal of International Law 275, 299-302.

2.3.3 Autonomous Weapons Systems and intervention.

The preceding section conducted an appraisal of two concepts which are central to *the jus ad bellum* - HI, and R2P. These were introduced not because of a pressing need for current thesis to conduct a thorough examination of them, but, merely to identify how they differ from the other exception to the Article 2(4) UN Charter prohibition on the threat or use of force. The primary difference is, of course, that while force applied in self-defence must be in response to armed attack or, an imminent armed attack, HI and R2P are interventionalist notions.

However, while interventionalist acts appear to be very different beasts to those considered under self-defence, the remainder of this section will demonstrate that acts in furtherance of HI and R2P are conceptually the same as those which are lawful under Article 51 UN Charter because they seek to abate attacks. This is vital when considering AWS, because rather than there being a need to identify or develop further guiding principles for AWS which are deployed with interventionalist motivations, it is more suitable instead to apply those that have already been identified in Part 2 of this chapter.

The primary reason the same rules should be applied is because, in all cases (other than when responding to an ongoing armed attack), nations must feel 'compelled' to respond due to some form of reprehensible behaviour that is being performed by another.[492] When acting in regard of interventionist notions, however, there is no 'absolute' need for immediate response - no imminent threat.[493] In other words, however slight it may be, there *is* a moment to pause, a moment to reflect, and to deliberate the most suitable course of action. Consequently, AWS deployments in furtherance of HI and R2P would generally be classified as 'offensive' acts (thus on the O spectrum of the O/D axis). Below, each of the four levels of the Template are considered in regard of AWS intervention in reverse order. However, it may be of use to note that neither Chapter

[492] As previously implied, whether acting in furtherance of HI or R2P, force is not the only option. In some instances, these will need to be examined in much greater detail. However, for the sake of the current examination, all acts falling short of force or a threat there-of, are largely irrelevant.
[493] This is of course in relation only to international peace and security. The point is, for the individuals affected by the crimes that R2P intends to prevent, the imminence may well be both grave and impending.

VII UN Charter, or the R2P agreement, mention, or indeed limit, the means or methods by which it interventionist objectives should be achieved.

2.3.3.2 L4AWS and Intervention.

As noted in Part 2, the use of L4AWS can be justified in very limited circumstances providing the need to act is instant, overwhelming with no choice of means, and no moment for deliberation.[494] Insofar as intervention, however, there is no such need. Thus, the use of L4AWS for HI and R2P purposes should be prohibited. This prohibition is arguably more important in the intervention sphere as the primary objective of those deploying AWS should be very different from that of self-defence. For example, when acting to protect territorial sovereignty and/ or political independence a nation should rightfully give gravitas to the aim of defeating the enemy as quickly as possible. However, when acting to protect societies most vulnerable, securing their protection may need to be identified as the most vital objective. This is also an important consideration when considering the flip side of the coin because arguably decisions to enter into interventionalist wars are strategic decisions. Thus, humans should not only be prevented from authorizing the use of AWS for interventionalist purposes, but Aws should be prevented from making decisions regarding the use of force for interventionalist purposes (including ordering human combatants to act).

2.3.4.3 L3AWS and Intervention.

As noted in Part 2, where there is a moment for deliberation and battle planning, the use of L3AWS may be permitted. Where they are deployed L3AWS are permitted to apply either a non-kinetic force, or a kinetic force. However, in either case the force applied must be non-lethal. This applies to both military personnel and the civilian population – and it is up to the individual responsible for deploying the AWS to ensure that is the case.[495] The individual responsible for deploying the L3AWS O/N must also, in every case pre-identify and authorise a target/ type of target/ group of targets. Where

[494] As also identified, however, it is perhaps more likely that an AWS which appears, on the face of it, to be making strategic level decisions, is actually a L3AWS having been delegated the authorization to act by a human operator.
[495] This is key to the concepts of accountability, command responsibility, and MHC, all of which are considered in greater detail in Chapter Six.

this is not possible, or where the deployment is potentially lethal, the use of L3AWS is prohibited.

2.3.4.4 L1 and L2AWS and Intervention.

Part 2 also identified that where there is a moment for deliberation and battle planning, the use of L1 and L2AWS is permitted. This is, of course subject to target verification, and not least, to command responsibility and proper use. Indeed, rather than being necessarily problematic, it is possible that States could even provide L1 & L2 AWS in order to assist the UN with its primary objectives. Although testing the legitimacy of such a claim is beyond the realm of this thesis, it is perhaps conceivable that in the future States could supply, or sub-contract the UN with individual, or battalions of AWS, with the sole purpose of protecting civilian life and property.

Over 120 States presently contribute equipment, resources and perhaps more importantly servicemen and women.[496] And, in just over seven decades, more than 3700 individuals have sacrificed their lives in the name of international peace and security, human rights assistance, and humanitarian support, while working under the banner of the UN.[497] With that in mind, it does not seem entirely unreasonable to suggest that future AWS that might be able to assist, or even independently carry out peacekeeping missions. The use of AWS in this way could allow for faster, and safer, deployment to hazardous areas.

It is difficult to find support for a prohibition on AWS's based upon humanitarian reasons, which may be due to the fact that these concepts often fail to meet their aspirations. For example, although the third tier of R2P (similarly to the UN Charter), does not accept an immediate resort to force on humanitarian grounds,[498] it does not prevent it all together. The point is the attendees at the 2005 summit were no doubt full of the best of intentions. However, they could never have imagined that the concept would very quickly become both controversial, and seemingly often of such little value.

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[496] See, 'Contributors to UN Peacekeeping Operations by Country and Post.' (UN, 31 March 2018) < https://peacekeeping.un.org/sites/default/files/1_summary_of_contributions_1.pdf > accessed .9 July 2021.

[497] See, 'Service and Sacrifice' (UN) < https://peacekeeping.un.org/en/service-and-sacrifice > accessed 9 July 2021.

[498] The obligation is to prevent, react, and construct. Military intervention should be the last resort. See e.g., Chinkin and Kaldor, *ibid*, n.378, 196.

Two authors, for example, question whether aims of the UN Security Council authorised actions in Libya, and Cote d'Ivoire in 2011, were more aligned with regime change than they were with preventing the commission of war crimes.[499]

Nevertheless, rather than AWS being considered a hindrance, they might in certain cases, in fact be forwarded as a friend of R2P.[500] Recently, there have been many reports of serious human rights abuses, including ethnic cleansing and war crimes, in States such as China, Yemen, Myanmar, and particularly Syria where the UN has confirmed President Assad has deployed chemical weapons on his own citizens. Nonetheless, the international community consistently finds itself unable to intervene with any great effect.

Although controversial, one author noted that in Kosovo, 'the ability of U.S. and NATO air forces to bomb Serbian targets, without resistance and beyond anti-aircraft missile range, likely made the decision to intervene easier.'[501] This was due largely to the concept of force protection (which is considered greater in the following chapter). Nonetheless, the current geopolitical climate means that regardless of foreign policy, many States are currently hesitant of deploying troops, and risking the lives of parents, sons and daughters for a fight which its many of its citizens feel is beyond its remit.

However, with the introduction of new unmanned technologies, force protection has increased significantly.[502] The introduction of AWS will continue this trend, and in terms of R2P, this may help to provide the emphasis to reboot the concept. And, although not as effective as boots on the ground, AWS may make humanitarian intervention more politically palatable due to the impact of the reduction of harm to one's own troops.[503] Though, as considered in Part 1, some remain critical that the use of AWS will lead reduction in the cost of war, however, if States were indeed able to harness AWS increase their capacity to react to humanitarian crises around the globe, then potentially tens of thousands of lives in the past few years alone, may have positively benefited.

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[499] *Ibid*, 207.
[500] See generally, Toscano, *ibid,* n.355.
[501] Yoo, *ibid,* n.265, 484.
[502] The US for example used Predator and Reaper UAVs in Libya between April and September 2011. Chinkin and Kaldor, *ibid*, n. 378, 206.
[503] Coleman, *ibid,* n.293, 36-37.

2.3.5 Autonomous Weapons Systems and Intervention: In Sum.

Part 3 has introduced the interventionalist concepts of R2P and HI. It also identified that together, these provide the second and third (of three) lawful exceptions to the prohibition on the threat or use of force that is contained within Article 2(4) UN Charter. Alongside self-defence, R2P and HI are, therefore, central tenets of the *jus ad bellum*. Thus, they are of considerable significance in the discussion regarding the development and deployment of increasing capable AWS. Interventionalist acts can be relatively easily distinguished from acts of self-defence However, the Part 3 analysis has demonstrated that where a state chooses to act in furtherance of either of these two notions, the same rules apply as have previously been introduced for regulating the use of AWS for the purpose of anticipatory self-defence.

This is the case, because when considering a resort to force with AWS, it is clear that anticipatory self-defence, HI, and R2P are conceptually the same thing – there being a no overwhelming need to act, and a moment for deliberation. In short this means a commander does have time to consider the means and methods of applying force, and moreover to ensure MHC is kept over the use of AWS. With that in mind, the following graphical representation provides a summary of which AWS are potentially lawful under the *jus ad bellum,*

(Cont.)

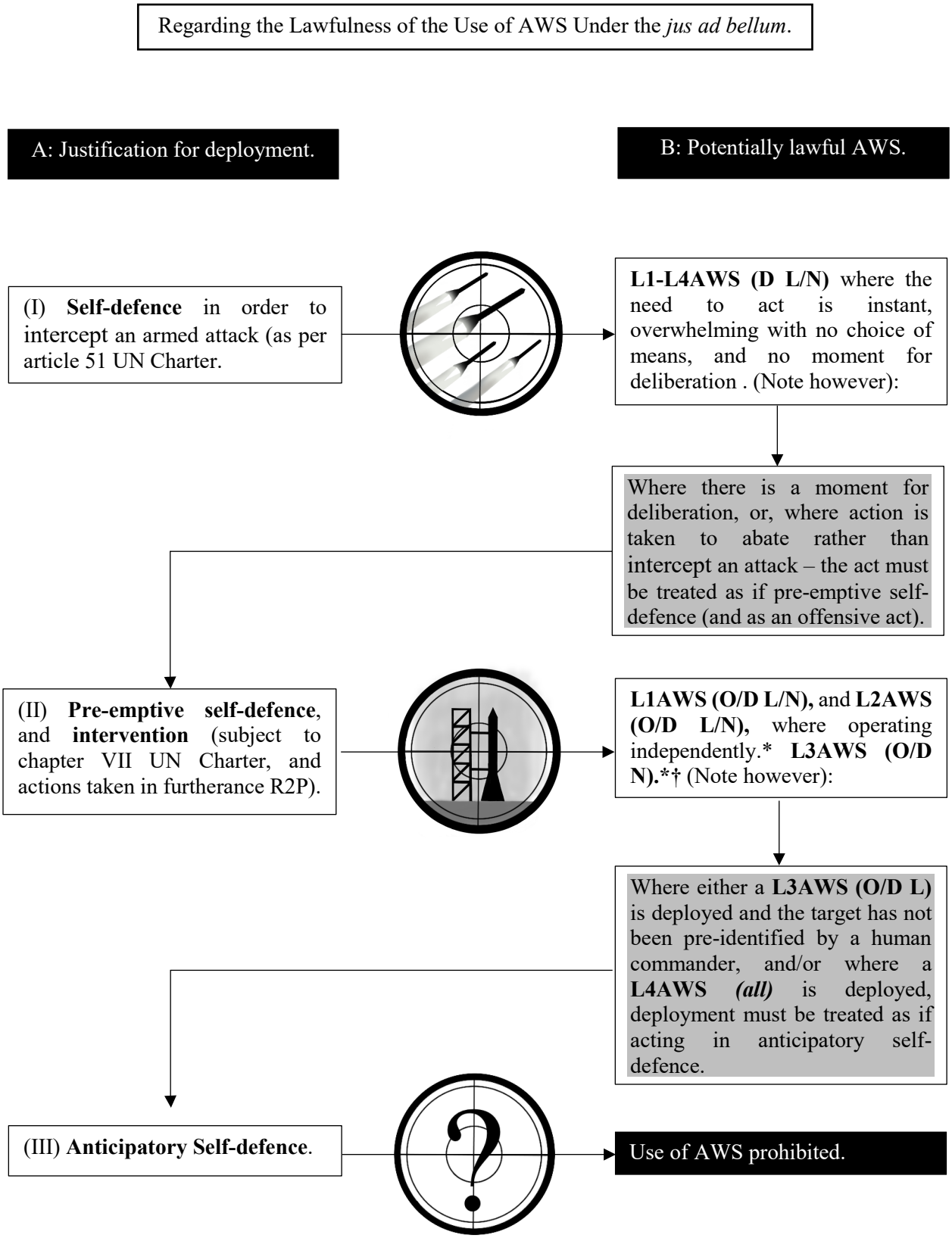

Figure 17: Summary of the Chapter Two discussion.

* Providing a specific target/ type of target/ group of targets has been pre-identified and authorised by a human commander.

† Noting lethality refers only to a potential, not an actual resulting harm(s). Lethal weapons are, therefore, considered to be those which are either anti-personnel (including those which target manned or piloted platforms such as aircraft and naval vessels), and/ or those which target uninhabited military objects, but which are deployed in a manner which is potentially injurious to civilian life.

2.3.6 Chapter Conclusion.

The primary purpose of Chapter Two has been to examine whether AWS, as defined by the *Template*, can be developed and deployed in a manner that is consistent with the *jus ad bellum*. For the purpose of this investigation, the *jus ad bellum* was distinguished from just war theory, with the latter being examined in Chapter Five due to the fact that is provides a predominantly ethical framework - as opposed to a set of positive legal obligations. The Chapter Two analysis, therefore, concentrated on the legal elements of the *jus ad bellum* that are of particular interest to the debate regarding AWS. These first of these - the prohibition on the threat or use of force that is contained within Article 2(4) UN Charter – was considered in Part 1. Specifically, this investigation was undertaken in light of the claim that AWS will reduce the cost of going to war. The remainder of Chapter Two examined the three exceptions to the Article 2(4) prohibition, in other words, the instances in which a threat or use of force is lawfully justifiable. Part 2 considered the first of these – the inherent right to self-defence (as identified in Article 51 UN Charter). While Part 3 analysed R2P, and HI, which were both demonstrated as being interventionalist notions.

During the comprehensive analysis of these three primary areas however, no evidence was found to support the hypothesis that the *jus ad bellum* should provide the platform for introducing an absolute prohibition on the development and use of AWS. In contrast, by utilizing two hypothetical scenarios, but with reference to the *Template* and authentic strategic considerations, Chapter Two identified how existing *jus ad bellum* principles can have a significant influence over the conduct of present and future autonomous military operations. By identifying and acknowledging the instances where this either occurs, or is set to occur, this chapter has been able to develop a number of General Principles (presented holistically in Chapter Seven) which help to initiate the process of constructing a legal framework to regulate the use

of AWS. These are summarized in figure 8 above, but the overarching postulation of Chapter Two is that the first of three legal disciplines that are examined by this thesis – namely the *jus ad bellum* – fully supports the regulation of AWS as opposed to supporting the *Prohibition.*

CHAPTER 3. ASSESSING THE LAWFULNESS OF AUTONOMOUS WEAPONS SYSTEMS UNDER THE JUS IN BELLO.

Chapter introduction.

Chapter Three continues the process of conducting a comprehensive legal analysis of Autonomous Weapons Systems (AWS) by extending the assessment to include the *jus in bello.*[504] This second body of law regards the use of AWS in armed conflict, and it is otherwise referred to as International Humanitarian Law (IHL).[505] Part 1 of this chapter begins by introducing IHL and establishing the circumstances within which it must be applied. Part 2 and Part 3 analyse IHLs two core principles, distinction and proportionality. Each of these plays a crucial role in ensuring the protection of the civilian population during wartime. Finally, Part 4 considers two additional concepts that are particularly relevant to AWS deployments in armed conflict – military necessity, and the duty to take precautions in attack. This IHL analysis is central to the task of creating a legal framework for regulating AWS, not least because the majority of the legal discussion relating to AWS is grounded within this discipline[506]

PART 1. What is International Humanitarian Law and When Does it Apply?

This section establishes what the *jus in bello* (IHL) is, when it applies, and importantly how it must be distinguished from the *jus ad bellum.* The distinction is significant for

[504] The primary purpose of Chapter Two was to assess whether (or not) it is possible for nations to utilise AWS as a method for resorting to force while remaining consistent with the obligations contained within the UN Charter, *ibid*, n.143. In particular, the analysis focused upon arts. 2(4) and 51.

[505] More recently, and with the support of the ICJ, these two independent bodies of law are more commonly referred to in the singular as International Humanitarian Law. Note that this body of law is also referred to as the Law of Armed Conflict (LOAC). Except where quoting directly, or when distinguishing between the *jus ad bellum* from the *jus in bello*, the current author utilises the term IHL. Note however, this is merely personal preference, and all three should be treated with equal regard. Note also that certain commentators like to sub-divide LOAC into the Law of International Armed Conflict (LOIAC), and the Law of Non-International Armed Conflict (LONIAC), see e.g., Dinstein, *ibid,* n.244, and Dinstein, *ibid,* n.364 respectively. Many of the differences in these two bodies of law are analysed below. However, because the legal principles that are most relevant to AWS are not only codified but customary in nature, they are applicable in both international and non-international conflicts.

[506] See generally e.g., HRW 2012, *ibid,* n.15. This is the report which is largely credited for bringing the discussion regarding AWS into the public domain, and it is grounded in the protestation that future AWS will not be capable of complying with IHL. For a very useful retort see generally, Schmitt, *ibid*, n.42. Also see generally e.g., Chantel Grut, 'The Challenge to Lethal Autonomous Robotics to International Humanitarian Law', (2013) 18 J. Conflict & Sec. L. 5, Asaro, *ibid,* n.317, and Sassoli, *ibid*, n.39.

two primary reasons. First, it is because though IHL *ensues* from the *jus ad bellum*, there is no other connection between,[507] and certainly no hierarchy.[508] The chapters only appear in their present order because the law pertaining to the resort to force, naturally precedes that which govern belligerents and the use weapons in armed-conflict.[509] A second bifurcation, although it is related to the first, is that although the two bodies share a similar language, the ideology behind the principles are very different.[510]

In addition, while states must constantly adhere to the UN Charter, they are bound by the principles of IHL only when participating in armed-conflict.[511] IHL only applies to the parties to a conflict, and not to those that are not participating.[512] Two types of armed conflict can be identified, International Armed Conflict (IAC), and Non-International Armed Conflict (NIAC). The former typically relates to a situation involving a war between two or more sovereign states. [513] In contrast, NIAC is used,

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[507] Dinstein, *ibid,* n.244, 4-5.

[508] In theory one could question whether in certain circumstances the case for using force in self-defence under the *jus ad bellum* is so extreme that *jus in bello* violations may be justifiable. However, this is not a generally accepted proposition and it can generally be overcome by ensuring the two distinct bodies of law remain this way. See e.g., Jasmine Moussa, 'Can *jus ad bellum* override *jus in bello*? Reaffirming the separation of the two bodies of law' (2008) 90 International Review of the Red Cross, 872, 963.

[509] See generally e.g., Green and Waters, *ibid*, n.299. As noted in Chapter Two, the authors of this piece identify that in many instances a resort to force, whether as an act of aggression, or in self-defence, will also be a declaration of war.

[510] See e.g., Dinstein, *ibid*, n.244, paras. 12-13.

[511] As noted by Dinstein, *ibid*, n.244, para. 1 an armed conflict may either take the form of a 'fully fledged war, or…amount to a 'short of war' clash of arms'. However, where such acts take place between two states, IHL will apply.

[512] Note common art. 2 of the four Geneva Conventions which identifies those Conventions apply to 'all cases of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognised by one of them'. The four Geneva Conventions are, Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (First Geneva Convention), 12 August 1949, 75 UNTS 31, Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (Second Geneva Convention), 12 August 1949, 75 UNTS 85, Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention), 12 August 1949, 75 UNTS, Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), 12 August 1949, 75 UNTS 287. (Hereinafter GCI, GCII, GCIII and GCIV respectively). In addition also note the protocols additional to the Geneva Conventions of the 12th August 1949, Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of API, *ibid,* n.43, Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977, 1125 UNTS 609 (hereinafter APII), Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Adoption of an Additional Distinctive Emblem (Protocol III) (hereinafter APIII).

[513] Common art. 2, for example, states, '[i]n addition to the provisions which shall be implemented in peacetime, the present Convention shall apply to all cases of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognised by one of them. The Convention shall also apply to all cases of partial or total occupation of the territory of a High Contracting Party, even if the said occupation meets with no armed resistance. Although one of the Powers in conflict may not be a party to the present Convention, the Powers who

for example, to refer to a conflict in which state forces are engaged with one or more non-state armed groups (NSAG) in an 'intra-state' manner. [514] As reaffirmed by the Appeal's Chamber in *Tadić*, IHL is applicable to both.[515]

IHL is codified within a number of international treaties, and most notably within the Geneva Conventions,[516] and their additional Protocols.[517] State practice and *opinio juris* further demonstrate that certain customs are binding.[518] These are commonly referred to as Customary International Law (CIL).[519] CIL binds all states, in both NIAC

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are parties thereto shall remain bound by it in their mutual relations. They shall furthermore be bound by the Convention in relation to the said Power, if the latter accepts and applies the provisions thereof.' An example of this is the Gulf war (2 August 1990 - 28 February 1991), in which the U.S. (and its allies) took action to support the state of Kuwait after it had been unlawfully invaded and annexed by Iraqi forces. Also note that in limited circumstances the classification of IAC may be applied to a situation when a State is involved in a conflict with an *organisation* as opposed to another state. This was the case, for example, when western force fought the so-called Islamic State of Iraq and Syria (ISIS). In addition, 'Wars of national liberation, in which peoples are fighting against colonial domination and alien occupation and against racist regimes in the exercise of their right of self-determination, may also, under certain conditions, be classified as IACs See, arts. 1(4), and 96(3) API. for a useful commentary see, ICRC, 'when does IHL apply?' (International Committee of the Red Cross (hereinafter ICRC)) http://blogs.icrc.org/ilot/2017/08/13/when-does-ihl-apply/ accessed 18 August 2020.

[514] See, Dinstein, *ibid.,* n.364, paras. 1-6. Noting, for example, that the ongoing hostilities between Israel, and Hezbollah and Hamas are an example of a NIAC. The author also notes that a NIAC may also be referred to as internal wars, or civil wars.

[515] See the judgement of the Appeals Chamber in *Tadic Case, ibid*, para. 70. Here it states, 'armed conflict exists whenever there is a resort to armed force between States or protracted armed violence between governmental authorities and organized armed groups or between such groups within a State. International humanitarian law applies from the initiation of such armed conflicts and extends beyond the cessation of hostilities until a general conclusion of peace is reached, or, in the case of internal conflicts, a peaceful settlement is achieved. Until that moment, international humanitarian law continues to apply in the whole territory of the warring States or, in the case of internal conflicts, the whole territory under the control of a party, whether or not actual combat takes place there.'

[516] See, GC's, *ibid*, n.512.

[517]See, APII and APII, *ibid,* n.512, and, API, *ibid*, n.43.

[518] See, art. 38(1)(b) Statute of the ICJ, *ibid*, n.57. This identifies international custom as source of international law. For a useful discussion on how CIL is formed, see, Emily Crawford, 'Blurring the Lines between International and Non-International Armed Conflicts - The Evolution of Customary International Law Applicable in Internal Armed Conflicts' (2008) 15 Austl Int'l LJ 29, 32-38. Also see, Dinstein, *ibid*, n.244, para 42. Here the author highlights the equal status given to both treaty law and custom, stating that 'the term 'source' – literally associated with a fountainhead from which a stream of water issues – does not do justice to the role that custom and treaties plat within the international legal systems. Custom and treaties are not the sources, but the very streams of international law, flowing either together or apart from each other'. For a comprehensive summary of customary provisions, see, Jean-Marie Henckaerts and Louise Doswald-Beck, *International Committee of the Red Cross: Customary International Humanitarian Law, Volume I: Rules* (ICRC, 2005) (Noting that the 161 rules that are identified therein, are hereinafter referred to as *ICRC Customary Rules*. It is important to note, however, that while these rules claim to represent existing customary laws, and while they are extremely influential, they do not represent legally binding law *per se*).

[519] See, *Nuclear Weapons Advisory Opinion, ibid*, n.73, para. 75. Here the court states, '[t]hese two branches of the law applicable in armed conflict have become so closely interrelated that they are considered to have gradually formed one single complex system, known today as international humanitarian law. The provisions of the Additional Protocols of 1977 give expression and attest to the unity and complexity of that law.' The ICJ also acknowledged that the Geneva Conventions and their additional protocols built upon the previous efforts to codify the combined laws and customs of war, notably 'The Hague Conventions of 1899 and 1907, *ibid*, n.138, the St. Petersburg Declaration, *ibid,*

and IAC, [520] regardless of whether a party is signatory to a IHL treaty. [521] And, somewhat, significantly, while APII is not as comprehensive as API, [522] CIL helps to fill any lacunae within the law relating to NIACs.[523] As a result and unless stated otherwise, the term armed conflict is intended to refer to both IAC and NIAC. [524]

At its heart, IHL has the arduous task of providing an unbiased mechanism for balancing two antithetical concepts. The first of these relates to the humanitarian concerns that are inherent in armed conflict. This is often referred to as the principle of 'humanity'. At the other end of the scale is the concept of 'military necessity'. This allows a combatant to take the 'measures which are…necessary to accomplish a legitimate military purpose.' [525] Such measures must not otherwise unlawful under

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n.138. They also note the Brussels Conference of 1874, The Regulations Respecting the Laws and Customs of War on Land, fixed the rights and duties of belligerents in their conduct of operations and limited the choice of methods and means of injuring the enemy in an international armed conflict and the Geneva Conventions of 1864, 1906, and 1929.

[520] Indeed, due to the fact that customary IHL is applicable in NIACs, it can also potentially bind non-state parties who are not provided with the opportunity to ratify treaties.

[521] See, ICRC Customary Rules, *ibid*, n.518.

[522] Note that in, Nicaragua Case, *ibid*, n.309 the ICJ identified that common art. 3 of the GC's offer only the minimum protections necessary in IAC and NIACs. Common art. 3 states, '[i]n the case of armed conflict not of an international character occurring in the territory of one of the High Contracting Parties, each Party to the conflict shall be bound to apply, as a minimum, the following provisions: (1) Persons taking no active part in the hostilities, including members of armed forces who have laid down their arms and those placed 'hors de combat' by sickness, wounds, detention, or any other cause, shall in all circumstances be treated humanely, without any adverse distinction founded on race, colour, religion or faith, sex, birth or wealth, or any other similar criteria. To this end, the following acts are and shall remain prohibited at any time and in any place whatsoever with respect to the above-mentioned persons: (a) violence to life and person, in particular murder of all kinds, mutilation, cruel treatment and torture, (b) taking of hostages, (c) outrages upon personal dignity, in particular humiliating and degrading treatment, (d) the passing of sentences and the carrying out of executions without previous judgment pronounced by a regularly constituted court, affording all the judicial guarantees which are recognised as indispensable by civilized peoples. (2) The wounded and sick shall be collected and cared for. An impartial humanitarian body, such as the International Committee of the Red Cross, may offer its services to the Parties to the conflict. The Parties to the conflict should further endeavour to bring into force, by means of special agreements, all or part of the other provisions of the present Convention. The application of the preceding provisions shall not affect the legal status of the Parties to the conflict.'

[523] Following their unprecedented study of CIL, the international Committee of the Red Cross identified that, '136 (and arguably even 141) out of 161 rules of customary humanitarian law, many of which run parallel to rules of Protocol I applicable as a treaty to international armed conflicts, apply equally to non-international armed conflicts'. For a useful overview see, Non-international armed conflicts (*ICRC*), https://casebook.icrc.org/law/non-international-armed-conflict#_ftnref_i_002 accessed 18 August 2020.

[524] Note that an armed conflict may change classification from international to non-international and *vice versa and* may even be considered as both simultaneously. Dinstein, *ibid*, n.244, para 98 calls this latter scenario 'dual conflict'. He provides the example of Afghanistan in 2001, where 'the Taliban regime, having fought a long-standing NIAC with the Northern Alliance, got itself embroiled in an inter-State war with an American-led coalition as a result of providing shelter and support to the Al-Qaeda terrorists who launched the notorious attack against the US on September 11th of that year (9/11).'

[525] 'Military Necessity' (*ICRC Casebook*), https://casebook.icrc.org/glossary/military-necessity Accessed 12 August 2020. The text continues, 'In the case of an armed conflict the only legitimate military purpose is to weaken the military capacity of the other parties to the conflict.'

IHL, though they may be under municipal law, and in some instances, International Human Rights Law.[526]

IHL is applicable to all belligerents, equally, and regardless of their *jus ad bellum* standing.[527] Consequently, it does not matter, for example, who is responsible for initiating a conflict, or whether (or not) the conflict is considered a *just* war or indeed lawful.[528] Moreover, under IHL, it does not matter whether an 'attack' takes place with the use of a catapult,[529] or with a ballistic missile. In each instance, and everything in between, exactly the same IHL principles will regulate the actions of combatants.[530]

Significantly, 'the right of the Parties to choose methods or means or warfare is not unlimited'.[531] This is key to the present analysis for if AWS can be demonstrated as operating in contravention of Article 35(1)API in particular, this would be at least one strong reason for prohibiting their use. A final key factor, as identified in the guiding principles adopted by the Group of Governmental experts (GGE) convened to discuss

[526] Note the principle of *lex speicialis* is considered in greater detail in Chapter Four. In short, this ensures that the body of law which relates to a specific subject, overrides a general obligation should the two conflict.

[527] See e.g., Michael N. Schmitt and Eric Widmar, 'The Law of Targeting' in Paul A.L. Ducheine, Michael N. Schmitt, Frans P.B. Osinga, (eds), *Targeting: The Challenges of Modern Warfare* (T.M.C. Asser Press 2016), 122, Dinstein, *ibid,* n.244, para 13. Here the author highlights that while some question whether the principle of equality of the belligerent parties should apply where there has been a clear breach of the *jus and bellum*, such a division of liabilities would have grave consequences for both civilians and soldiers who found themselves on the wrong side of a war for which they could not be held responsible.

[528] As previously noted, just war theory is considered in Chapter Five. However, the point here is, IHL protections are afforded to all, including those who might be responsible for previous *ad bellum* or *in bello* breaches.

[529] Art. 49(1) API, *ibid*, n.43 identifies that under IHL, '"Attack" means any acts of violence against the adversary, whether in offence or in defence.' IHL therefore places little-to-no weight upon the circumstances surrounding each and every attack. Instead, it accepts that exchange of violence is inevitable consequence of armed conflict. Also see, Dinstein, *ibid,* n.244, para 8 where the author notes the term attack 'is narrower than the term "hostilities"'. According to Dinstein, '[n]on-violent acts tied to military operations…(whilst are still captured by the term hostilities)…do not come within the bounds of attacks'.

[530] It is perhaps important to note that the use of weapons outside of a designated armed conflict will not be governed by IHL. Where instead, weapons are used in the municipal environment, such as by a municipal police force or other law enforcement officers, it is much more likely that International Human Rights instruments would be the most relevant and applicable form of international law. This is considered in greater detail in the following chapter.

[531] Art. 35 API, *ibid,* n.43 states, '(1). In any armed conflict, the right of the Parties to the conflict to choose methods or means of warfare is not unlimited. (2). It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering. (3). It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment.'

the potential challenges posed by AWS,[532] IHL applies (in full) to all weapons systems, including (lethal) AWS. [533] This is presented in the following RULE,

RULE 9
The development and use of AWS is, and will remain, subject to International Humanitarian Law.

PART 2. Fundamental Principles of IHL: Distinction.

Part 1 introduced IHL and considered its scope and purpose. Part 2 identifies the first IHL obligation which is especially relevant to the introduction of increasingly autonomous, armed, technologies – the Principle of Distinction. In the first instance (as is required by the doctrinal approach), the positive legal obligation is identified first. Once established, as per the thesis aims, the obligation forms a key part of focused analysis. In each case the researcher asks the specific question, how does the existing legal obligation affect the various classifications of AWS as identified on the *Template*?

Distinction is key to achieving the IHL humanity/ military necessity balance. Indeed, it is the essential first step in mitigating civilian risk,[534] which is why the ICJ have referred to it as the 'cornerstone' of IHL. [535] Distinction, or the 'basic rule' is contained within Article 48 of API which states,

> '[i]n order to ensure respect for and protection of the civilian population and civilian objects, the parties to the conflict shall at all times distinguish between civilian objects and military objects and accordingly shall direct their operations only against military objectives.'

[532] See, GGE meetings, *ibid,* n.7 for dates and other information regarding the various meetings.
[533] CCW, *ibid,* n.84.
[534] See e.g., Geoffrey Corn, James A. Schoettler Jr, 'Targeting and Civilian Risk Mitigation: The Essential Role of Precautionary Measures' [2015] Mil. L. Rev. 785, 789.
[535] Nuclear Weapons Advisory Opinion, *ibid*, n.73, para. 78. Also see e.g., Schmitt and Widmar, *ibid,* n.527, at 382.

Although this provision can be broken down into a number of individual elements,[536] the basic rule contains two primary protections. First, civilians *must* be distinguished from legitimate military targets.[537] Second, once distinguished, civilians must not be made the object of direct attack.[538] As is examined on greater detail below, the argument that the technology is not available to allow for AWS to be capable of making such a distinction, is central to the call for them to be prohibited.

The basic rule is expanded upon by Article 51 API which reaffirms civilians must not be made the object of an attack,[539] while adding that civilians are also protected against indiscriminate attacks.[540] Indiscriminate attacks are defined by Article 51(4)API.[541]

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[536] *ICRC Customary Rules*, *ibid*, n.518, 3-76 identifies 24 separate rules under the heading of distinction. See also the supporting volume which provides evidence of state practice relating to each customary rule, Jean-Marie Henckaerts and Louise Doswald-Beck, International Committee of the Red Cross: Customary International Humanitarian Law, Volume II: Practice (2005), (hereinafter *ICRC Customary Rules, Vol. 2),* Chapter One, Section A, § 1-475.

[537] As confirmed by the international Criminal Court (hereinafter ICC) in Prosecutor v. Stanilav Galic (Trial Judgement and Opinion), IT-98-29T, International Criminal Tribunal for the former Yugoslavia (ICTY), 5 December 2003 (hereinafter *Galic Case*), art. 50 API defines 'civilians' in the negative stating '[a] civilian is any person who does not belong to one of the categories of persons referred to in Article 4(A)(1), (2), (3) and (6) of the Third Convention…[GCIII, *ibid,* n.512]…and in Article 43 of this protocol…[API, *ibid*, n.43]…in the case of doubt whether a person is a civilian that person shall be considered to be a civilian'. The categories of person who are not defined as civilians are positively identified in art. 4A GCIII, *ibid,* n.512, are, '1) Members of the armed forces of a party to the conflict as well as members or volunteer corps forming part of such armed forces. 2) Members of other militias and members of other volunteer corps, including those of organized resistance movements, belonging to a Party to the conflict and operating in or outside their own territory, even if this territory is occupied, provided that such militias or volunteer corps, including such resistance movements, fulfil the following conditions: a) that of being commanded by a person responsible for his subordinates, b) that of having a fixed distinctive sign recognizable at a distance, c) that of carrying arms openly, d) that of conducting their operations in accordance with the laws and customs of war. 3) Members of regular armed forces who profess allegiance to a government or authority not recognised by the detaining power…6) Inhabitants of a non-occupied territory who, on the approach of the enemy, spontaneously take up arms to resist invading forces, without having had time to form themselves into regular armed units, provided they carry arms openly, and respect the customs of war.' Art. 43 API, *ibid*, n.43 provides, '1. The armed forces of a Party to a conflict consists of all organizes armed forces, groups and units which are under a command responsible to that Party for the conduct of its subordinates, even if that Party is represented by a government or an authority not recognised by an adverse Party. Such armed forces shall be subject to an internal disciplinary system that, *inter alia*, shall enforce compliance with the rules of international law applicable in armed conflict. 2. Members of the armed forces of a Party to a conflict (other than medical personnel and chaplains covered by Article 33 of the Third Convention) are combatants, that is to say, they have the right to participate directly in hostilities. 3. Whenever a Party to a conflict incorporates a paramilitary or armed law enforcement agency into its armed forces it shall notify the other Parties to the conflict.' In *Galic Case*, *ibid,* n.537 the trials chamber in also note that '[c]ombatants and other individuals directly engaged in hostilities are considered to be legitimate military targets.

[538] Art. 48 API, *ibid,* n.43.

[539] Art. 51(2) API, *ibid,* n.43 in particular states '[t]he civilian population as such, as well as individual civilians shall not be made the object of attack.

[540] Art. 51 API, *ibid*., n43.

[541] Art. 51(4) API, *ibid,* n.43 identifies that, '[i]ndiscriminate attacks are prohibited. Indiscriminate attacks are: (a) those which are not directed at a specific military objective, (b) those which employ a method or means of combat which cannot be directed at a specific military objective, or (c) those which employ a method or means of combat the effects of which cannot be limited as required by this Protocol,

Art. 13(2) APII (applicable to (NIACs) states similarly that, '[t]he civilian population as such, shall not be made the object of attack'.[542]

The ICRC identifies that the protections against direct,[543] and/ or against indiscriminate attacks are CIL.[544] There is further reference to distinction elsewhere within the treaties,[545] and perhaps most relevant is the Rome Statute of the International Criminal Court, which provides that 'intentionally directing attacks against the civilian population' is considered to be a war crime in both IAC,[546] and NIAC.[547]

As the basic rule also affords protection to civilian objects. This is expanded upon by Article 52(1) API stating, '[c]ivilian objects shall not be the object of attack or reprisals.'[548] As is the case with civilians, civilian objects are defined in the negative - being 'all objects which are not military objectives'.[549]In the case of doubt as to the correct status of an object, it must be presumed to be a civilian object.[550] Though there

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and consequently, in each such case, are of a nature to strike military objectives and civilians or civilian objects without distinction.' Art. 51(5), additionally states that, '[a]mong others, the following types of attacks are to be considered as indiscriminate: (a) an attack by bombardment by any methods or means which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects, and (b) an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.'

[542] Art. 13(2) APII, *ibid,* n.512.

[543] See, *ICRC Customary Rule 1, ibid*, n. 518 states, 'Rule 1. The parties to the conflict must at all times distinguish between civilians and combatants. Attacks may only be directed against combatants. Attacks must not be directed against civilians', Also see, ICRC Customary Rules, Vol. 2, *Ibid.,* n. 536, Rule 1, and, ICRC online customary IHL database (hereinafter *ICRC database*), https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule1 accessed 20 August 2020, and for related state practice, ICRC database at, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule1 accessed 20 August 2020.

[544] See, ICRC Customary Rules 11 and 12, *ibid*, n. 518. Also see, ICRC Customary Rules 11 and 12, Vol. 2, *ibid*, n.536. The vast majority of the international community has ratified the GC's. Ratification of the AP's is not quite so widespread. Perhaps the two most notable exceptions to the APs are the United States and Israel.

[545] See e.g., The preamble to the St. Petersburg Declaration, *ibid*, n.138, and the preamble to the Ottawa Convention, *ibid*, n.138, Art. 25 of the Hauge Regulations, *Ibid,* n.138, Art. 3(2) of Amended Protocol II CCW, i*bid*, n.138, Art. 3(7) CCW, *ibid,* n.138, and Art. 2(1) Protocol III CCW, *ibid,* n.138.

[546] Art. 8(2)(b)(i) Rome Statute, *ibid*, n.14.

[547] Art. 8(2)(e)(i), *ibid*.

[548] Art. 52(1) API, *ibid*, n43. For further reference also see, art. 3(7) Amended Protocol II CCW, *ibid.,* n.138, and art. 2(1) Protocol III CCW, *ibid.,* n.138.

[549] Art. 52(1) API, *ibid*, n.43. According to Article 52(2) API, *ibid*, n.43 military objects are, 'limited to those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage'.

[550] More specifically, art. 52 (3) API, *ibid*, n.43 states, 'In case of doubt whether an object which is normally dedicated to civilian purposes, such as a place of worship, a house or other dwelling or a school, is being used to make an effective contribution to military action, it shall be presumed not to be so used.' Note that this refers to property insofar as the property is 'normally dedicated to civilian purposes'. For a useful discussion see, John. J. Merriam, 'Affirmative Target Identification: operationalizing the

is no reference to the need to distinguish civilian objects from military objects within the text of APII,[551] some commentators believe that Article 13(1) APII is 'arguably broad enough to cover it'.[552] Nonetheless, the ICRC identify that the protection placed upon civilian objects is a customary norm that is applicable in both IAC and NIAC.[553]

The prohibition on indiscriminate attacks contained within Article 51(4) API applies as much to civilian objects, as it does to civilian themselves.[554] and is also applicable during IAC and NIAC.[555] Furthermore, 85(3)(b) API provides that, 'launching an indiscriminate attack affecting the civilian population or civilian objects in the knowledge that such an attack will cause excessive loss of life, injury or damage to civilian objects' will be considered a grave breach of the protocol.

It is clear from the discussion in Part 2, thus far, that the cardinal IHL principle of distinction is applicable to AWS. Therefore,

RULE 10
Where civilians are present AWS must be capable of distinguishing civilians and civilian objects from legitimate military objectives. Following this distinction, an AWS must also ensure that only legitimate military objectives are the subject of a direct attack, and that civilians and civilian objects are not subjected to indiscriminate attacks.

3.2.2 The Principle of Distinction and Autonomous Weapons Systems.

Before examine distinction in relation to AWS, two further concepts need to be considered. These must be addressed, because while RULE 10 reflects a legal obligation to distinguish, the obligation, and the RULE is based upon an underlying

principle of distinction for US Warfighters' [2016] 56 Va. J. Int'l L. 83, 91-92. Though also note there is no 'absolute' prohibition on attacking such objects.

[551] It was included in the draft protocol, see, Commentary to Article 24(1), Draft Additional Protocols to the Geneva Conventions of August 12, 1949 (ICRC) https://www.loc.gov/rr/frd/Military_Law/pdf/RC-Draft-additional-protocols.pdf accessed 10 July 2021.

[552] See, *ICRC Customary Rules, ibid*, n. 518, 27, at n.14. Also note, art. 13(1) APII, *ibid*, n.512 states, '[t]he civilian population and individual civilians shall enjoy general protection against the dangers arising from military operations…'

[553] See, *ICRC Customary Rule 7*, *ibid*, n.518, and in support, *ICRC Customary Rule 7*, Vol. 2, *ibid*, n.536.

[554] Art. 51(4) API, *ibid,* n.43.

[555] *ICRC Customary Rule 7*, *ibid*, n.518.

expectation 'that one is able to make a distinction…clearly and easily.' [556] Unfortunately, in many cases, that is simply not the case. On the contemporary battlefield, combatants do not always identify themselves as such, [557] and civilians can also choose to take up arms and participate. [558] In addition, it may also be difficult to establish the status of a particular individual, such as a surrendering solider, or another protected individual who falls under the banner of persons *hors du combat*.

3.2.3 Elements of Distinction: Direct Participation in Hostilities.

This section considers the first of the two additional concepts relating to distinction - civilian participation. As previously identified, Articles 51 API, [559] and 13 APII, [560] relate to the general protection of the civilian population against the dangers arising from military operations in both International Armed Conflict (IAC), and Non-International Armed Conflict (NIAC), respectively. The concept of DPH, which, in the modern era is inextricably intertwined with the general protection, is found codified within paragraph 3 of each of these provisions.[561]

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[556] See, Emily Crawford, *Identifying the Enemy: Civilian Participation in Armed Conflict* (OUP 2015), 1.

[557] As stated in art. 44(3) API, *ibid,* n.43 '[i]n order to promote the protection of the civilian population from the effects of hostilities, combatants are obliged to distinguish themselves from the civilian population while they are engaged in an attack or in a military operation preparatory to an attack. Recognizing, however, that there are situations in armed conflicts where, owing to the nature of the hostilities an armed combatant cannot distinguish himself, he shall retain his status as a combatant, provided that, in such situations, he carries his arms openly: a) during each military engagement, and b) during such time as he is visible to the adversary while he is engaged in a military deployment preceding the launching of an attack in which he is to participate…' See also, art. 4(A)(2) GCIII, *ibid,* n.512. This supplies that in order for an individual to granted prisoner of war status his must satisfy the following conditions: 'a) that of being commanded by a person responsible for his subordinates, b) that of having a fixed distinctive sign recognizable at a distance, c) that of carrying arms openly, d) that of conducting their operations in accordance with the laws and customs of war.'

[558] See, Nils Melzer, *Interpretive Guidance on the Notion of Direct Participation in Hostilities Under International Humanitarian Law* (ICRC, 2009) (hereinafter *ICRC DPH Guidance*) <https://www.icrc.org/en/doc/assets/files/other/icrc-002-0990.pdf> accessed 13 October 2020. This identifies two categories of *DPHing* civilians, (i) those with a continuous combat function (CCF), and (ii) those part time fighters that are referred to as "farmers by day, fighters by night". According to the ICRC, only the former remains targetable, though this perspective is not without its critics. For a useful discussion and a summary of the alternative argument, see generally, Grimal and Pollard (2020), *ibid*, n.4.

[559] Art. 51 API, *ibid,* n.43.

[560] Art. 13 APII, *ibid*, n.512.

[561] See e.g., art 51(3) API, *ibid,* n.43, and art. 13(3) APII, *ibid*, n.512.

These state that, '[c]ivilians shall enjoy the protection afforded by this section, unless and for such time as they take a direct part in hostilities'.[562] This is a codification of widely accepted, and long-established custom, [563] that an individual taking a direct part in hostilities becomes lawfully targetable.[564] A significant issue, however, is that the treaties offer no precise guidance as to which actions, or associations, should constitute DPH.

At the time the AP's were drafted, the majority of IACs were fairly traditional in character—combatants were generally uniformed members of a state's professional armed forces. However, that is simply no longer true. [565] Indeed, some have argued that in recent years the standing of the legal concept of DPH has become almost untenable,[566] due to the fact that armed forces and the civilian population are often one in the same.[567]

Much has written on DPH, including by the present researcher.[568] Perhaps the most noticeable contribution is that of the ICRC. After over five years of rigorous research, they published their Interpretive Guidance on the Notion of Direct Participation In Hostilities Under International Humanitarian Law, in 2009.[569] While influential, this guidance is neither legally binding, nor has it gone unchallenged.[570] Therefore, while

[562] *Ibid.* Note that the text of art. 13(3) APII is the same as art. 51(3)API, *ibid,* n.43 with the exception that the term 'section' is replaced with 'Part'. This is generally considered to be a matter of semantics but may be due to the fact that APII is generally less extensive in application than API.
[563] See, *ICRC Customary Rule 6*, *ibid,* n.518.
[564] Hugo Grotius, '*The Law of War and Peace'* (1625) in Leon Friedman (Ed). *The Law of War: A Documentary History* (New York: Random House, 1972), Book 3, Chapter 3, VIII-X.
[565] The last truly peer-on-peer armed conflict that the U.S. was involved in, for example, was the Iraqi conflict in 1991 (code named Operation Desert Storm). In fact, many identify the Battle of 73 Easting, fought on 26 February 1991 as part of the offensive as the last great aromoured tank battle of the 21st century. See e.g., Craig Bowman, 'The last Great Tank Battle of the 21st Century' (*War History Online,*15 May 2016) https://www.warhistoryonline.com/war-articles/the-last-great-tank-battle-of-the-20th-century.html, accessed 14 October 2020, Also see, Logan Nye, 'The story of 'the last great tank battle' where the US destroyed 30 Iraqi tanks' (*We Are The Mighty*, 29 February 2016) https://www.businessinsider.com/the-last-great-tank-battle-where-the-us-destroyed-30-iraqi-tanks-2016-2?r=US&IR=T accessed 14 October 2020, and, Thomas Gibbons-Neff, 'The tank battle that came to define the early career of Trump's new national security adviser' (Washington Post, 21 February 2017) https://www.washingtonpost.com/news/checkpoint/wp/2017/02/21/the-tank-battle-that-came-to-define-the-early-career-of-trumps-new-national-security-adviser/ accessed 14 October 2020.
[566] See generally, Crawford, *ibid,* n.556.
[567] *Ibid*, 1. Here Crawford asks, '[w]hat does one do then if a combatant looks like a civilian, or if a civilian looks like a combatant?'
[568] See generally, Grimal and Pollard (2020), *ibid*, n.4.
[569] Generally, ICRC DPH Guidance, *ibid,* n.558.
[570] See generally, Grimal and Pollard (2020), *ibid*, n.4 for a useful commentary.

courts and tribunals may sometimes interpret in line with it, [571] international jurisprudence still struggles to provide a definite interpretation, and courts are anxious about examining disputes on anything other than a case-by-case basis. [572]

It is beyond the scope of the present thesis to attempt to provide an answer to the difficulties surrounding the concept of DPH. However, the primary problem is contemporary conflict increasingly takes place on or near to the civilian population. It tends to involve at least one party who whose part-time militias are constructed of individuals who would readily refer to themselves as civilians at least some of the time.

Often factions are limited to family sized units who only come together for larger operations due to the fact that their personal objectives and/ or political motivations are not always clearly aligned.[573] Dressed in civilian clothing and failing to carry arms openly (contrary to IHL),[574] once a particular operation is over it is easy for them to disperse back into an urbanized civilian environment where they can seemingly disappear without trace.

This poses significant challenges to the programmers of AWS, who *will* find it immensely difficult to codify the ability to identify which civilian are "DPHing" and therefore, lawfully targetable, and those who are not. However, this is quite simply because human combatants currently find it an immensely difficult task identifying which civilians are DPHing. As noted, this is not least due to the fact that current interpretations are inadequate. Nevertheless, one hope this will not always be the case.

Due to these obvious difficulties, there have been calls for an additional protocol, or some other soft law document to support Article 51 API, [575] and 13 APII.[576] And, it is not unfathomable that the introduction of AWS may, in fact, motivate parties play a role in negotiating and supporting such. If this does happen, it will undoubtably offer greater support to national rules of engagement relating to AWS deployments, and

[571] See, *Galic Case,* para. 48. Here the ICTY states 'to take a direct part in the hostilities means acts of war which by their nature or purpose are likely to cause actual harm to the personnel or material of the enemy armed forces'.
[572] See generally, Grimal and Pollard (2020), *ibid*, n.4 for a useful commentary.
[573] See e.g., David Kilcullen, *The Dragons and the Snakes: How the Rest Learned to Fight the West* (Hurst, 2020) 46-53.
[574] *Ibid,* also noting the text of art. 4(A)(2) GCIII, *ibid*, n.557.
[575] See, *ibid,* pp144-145.
[576] See, Crawford, *ibid,* n.556, 203-234.

indeed to all individuals associated with AWS deployments, be they programme writers, combatants, military lawyers, an/ or judges sitting at military tribunals, and international courts.

In lieu of such guidance, however, and until AWS can be proven capable enough of operating in accordance with DPH, the following rules can be distilled from the existing obligation,

RULE 11
Until a definitive interpretation of Direct Participation in Hostilities (DPH) is agreed upon, and until an AWS has the proven ability to carry out the level of DPH assessment that is required by the conditions of the mission, AWS must not be deployed where such assessments are likely to be necessary.

Moreover, the following rule is offered in support of that posited above,

RULE 12
Where an AWS is deployed into an environment where an (unpredicted) DPH assessment becomes necessary, and where that AWS does not have the capacity to carry out the required level of DPH assessment (or where there is no additional guidance from a third-party), AWS must refrain from taking further action. This may be either aborting the mission entirely, or continuing the mission once the need for a DPH assessment has passed.

Rules 11 and 12 allow for the development of AWS to continue, but clearly restricts deployments until such time as the tech advances enough for them to be fully compliant with DPH. The benefit of both RULES, however, is that each time the tech does improve, there is no need to return to the negotiating table to draft new RULES.

3.2.4 Elements of Distinction: 2. *Hors Du Combat.*

This section considers the second primary issue with distinction – persons considered *hors du combat*. Conceptually speaking, *hors du combat* is somewhat of an opposite of DPH because it refers to combatants who is *not* involved in the fighting – as opposed civilian who are. Article 41(1) API ensures those considered *hors-de-combat* shall not

be made the object of attack. With Article 41(2) API identifies the types of individual whom this might apply to.[577]

As is true of AWS distinction generally, much ink has been split on the matter of AWS adherence to *hors du combat*.[578] One author neatly summarises the primary objections on in this respect, even going as far as to suggest that *hors du combat* may be one of the primary reasons as to why AWS are incompatible with IHL.[579] For the time being, AWS are generally not capable of identifying persons *hors du combat* in all circumstances. an AWS would need exactly the same level of critical assessment to identify a surrendering soldier (or any other such individual list in Article 41(2) APII), as it would a child with a toy gun.[580] Consequently, their use must be restricted in the early stages of their development. As a result,

RULE 13
A commander who is responsible for deploying an AWS to an environment where civilians, or belligerents are present, must ensure that AWS is capable of identifying an individual who is *hors du combat*.

The following rule is also offered in support,

[577] Art. 41(2) API, *ibid,* n.43 states, 'A person is hors du combat if: a) he is in the power of an adverse party, b) he clearly expresses an intention to surrender, or c) he has been rendered unconscious or otherwise incapacitated by wounds or sickness, and therefore is incapable of defending himself, provided that in any of these cases he abstains from any hostile act and does not attempt escape'. See also, *Galic Case*, *ibid,* n.537, para 88. Here, the trials chamber identifies, '[c]ombatant status implies not only being considered a legitimate military objective, but…being entitled to special treatment when hors-de-combat, i.e., when surrendered, captured or wounded'.

[578] See e.g., HRW (2012), *ibid*, n.15, 34, HRW (2015), *ibid,* n.191, 19-20, HRW (2016), *ibid,* n.312, 26. Also see e.g., Daniel Amoroso, 'Jus in bello and jus ad bellum arguments against autonomy in weapons systems: A re-appraisal', 8 QIL 43 (2017) 5, 13-15.

[579] See, Amoroso, *ibid*, 15, noting that because hors du combat is a factor that has the potential to arise in almost every environment, the use of AWS is inherently problematic no matter what the circumstances surrounding their use. In addition, he grounds his argument regarding hors du combat in the concept of military necessity – there being no necessity to engage a combatant hors du combat. Also see e.g., Robert Sparrow, 'Robots and Respect: Assessing the Case Against Autonomous Weapon Systems' [2016], 30, 1, Ethics & International Affairs, 93, 111.

[580] See e.g., HRW (2012), *ibid*, n.15, 31-32.

RULE 14
Where an AWS is deployed in a situation where a *hors du combat* assessment is required, and where that AWS does not have the capacity to carry out the required level of hors du combat assessment (or where there is no additional guidance from a third-party), the AWS must refrain from taking further action. This may be either aborting the mission entirely, or continuing the mission once the need for an hors du combat assessment has passed.

3.2.5 Scenario III.

Having identified a number of general issues with the principle of distinction, the remainder of Part 2 conducts a focused assessment of AWS. Specifically, the four levels of autonomy that make up the backbone of the *Template.* These are each considered to determine whether it is possible to deploy AWS lawfully onto existing and future battlefields. In order to add an element of clarity to the discussion, a further scenario is introduced. This is intended to read as a continuation of scenarios I and II posited previously, noting that the Chapter Three analysis is entirely upon IHL.

Australe's Missile Defence Shield (MDS) is extremely effective. It positively identified, and intercepted each of Orientale's ballistic missiles. Australe intelligence confirmed that none of the destroyed missiles carried a nuclear warhead. And, with the immediate threat eliminated, Australe chose not to immediately react with force. Instead, with the support of the United Nations Security Council (UNSC) and following a number of diplomatic meetings, the states avoided conflict by negotiating a peace deal. However, a year after the resulting bilateral agreement to maintain peace between the two states, was ratified Orientale's have refused to let UN weapons inspectors enter its territory (a condition of the agreement). Orientale has also simultaneously stated that it has completed its uranium enrichment program and is now in possession of nuclear warheads (also in breach of the peace deal). Orientale's has recently stated that it is preparing to deploy these weapons. The threats have been aimed at Australe in particular. Australe's has firm intelligence identifying that while Orientale has not completed its enrichment programme, it is likely to in the very near future. As a result, invoking its inherent right of self-defence under Article 51 of the UN Charter, Australe launches a military operation against Orientale. The operation (codenamed - Island

Storm) has the goal of locating and eliminating the nuclear threat. It also has the secondary purpose of identifying those responsible for authorising and conducting the enrichment program, in order for them to be held accountable. In order to do so, Australe must employ force and enter Orientale's territory. Orientale is an island nation, and city state. The topography of the island is around 50% densely populated urban environment (approximately 50 square miles to the West), and 50% sparsely populated mountainous territory to the East. Australe intelligence has identified that a complex tunnel system has been developed and is maintained by government forces within the mountain region, and, that a bunker complex, and command and control centre (CCC) are also located within the region. Intel suggests that there is a high possibility that defensive and offensive weapons systems are also located there. In addition, Orientale also has a number of military complexes located within its urbanized environment. This includes the islands only airfield which is located near the coastline in the North/ West of the island. This is dual use, thus Orientale's Air Force, and a number of civilian aviation carrier operate from it. Operation Island Storm has already been initiated, armed conflict has been declared, and the Commander and supporting staff of Australe's Joint Forces Command is assessing how best to deploy its various AWS.

3.2.6 L4AWS and the Principle of Distinction.

The following sub-section considers the first of the four levels of autonomy that are identified by the *Template* – L4AWS. As a reminder, L4AWS are defined as ***Executive Operating Systems*** **which, once activated, are capable of strategic level decision-making.** As discussed in the previous chapter, such decisions may include those relating to the matter of entering (or not) into a fresh armed conflict. However, as the following analysis reveals, in many cases strategic decisions can also be those which regard the choice of the *means* and *methods* of conducting warfare.[581] This is most apparent when considering the use of nuclear weapons, and scenario III provides a useful point of focus from which to conduct an appraisal.

[581] See e.g., Art. 57(2) APII, *ibid,* n.512 stating '…take all feasible precautions in the choice of means and method of attack with a view to avoiding, and in any event minimizing, incidental loss of life, injury to civilians and damage to civilian objects…' Also see, art. 35(1) API, *ibid*, n.43 stating, '…the right of the Parties to choose methods or means or warfare is not unlimited.'

As noted in the Scenario I, in contrast to *Orientale, Australe's* weapons' arsenal does include nuclear weapons. Thus, from a strategic perspective, a nuclear attack may be a legitimate option.[582] Nuclear weapons are the epitome of strategic weaponry.[583] And therefore, a L4AWS could potentially be delegated decision-making responsibilities regarding their deployment. Given *Orientale's* size, and location, an *Australe* L4AWS may be able to limit the effects of a such an attack to *Orientale's* territory only. Moreover, by utilising a nuclear weapon as a *means* may also offer *Australe* a high level of force protection.[584]

Nuclear weapons are unique and can be distinguished from conventional weapons in a number of different ways.[585] For the purpose of the present analysis, one distinguishing (though not unique) feature is that their overwhelming destructive capabilities cannot be limited to certain types of target. In short, nuclear weapons cannot distinguish between the civilian population and/ or civilian objects and legitimate military objectives.

As previously noted, the ICJ have not altogether ruled out the possibility that there may be circumstances in which an attack carried out with a nuclear weapon could be lawful,[586] in the vast majority of circumstances any authorisation of an attack would

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[582] Strategically speaking, if the targeted nation was also nuclear power, it would be unwise to launch a nuclear attack with just one munition as was the case in Hiroshima and Nagasaki - the only two occasions that a nuclear device has been detonated. This is because, as noted in the previous chapter, a nuclear attack might be a lawful response, and *jus ad bellum* proportionality does not restrict such a response to just a single missile. Were a nation to launch a nuclear attack against a nuclear peer, in other words, it would most likely need to be carried out in such a way that it overwhelmed the adversary in in order to prevent the peer from retailing like-for-like (this is the foundational basis of nuclear strategy) See generally, Gray, *ibid,* n.66.

[583] Note, for example, that United States Strategic Command (USSTRATCOM) states it mission is 'to deter strategic attack and employ forces, as directed, to guarantee the security of our Nation and our Allies. The command enables Joint Force operations and is the combatant command responsible for Strategic Deterrence, Nuclear Operations, Nuclear Command, Control, and Communications (NC3) Enterprise Operations, Joint Electromagnetic Spectrum Operations, Global Strike, Missile Defense, Analysis and Targeting, and Missile Threat Assessment.' See, 'About' (*USSTRATCOM)* https://www.stratcom.mil/About/ accessed 4 May 2021.

[584] See e.g., Dinstien, *ibid,* n.244, paras. 449-452.

[585] See, Anthony J Colangelo, 'The Duty to Disobey Illegal Nuclear Strike Orders' (2018) 9 Harv Nat'l Sec J 84, 85 who identifies five primary ways in which nuclear weapons differ from conventional weapons, '[f]irst, quantitatively, the blast power, heat, and energy generated far outstrip that of conventional weapons, likely rendering nuclear weapons indiscriminate. Second, qualitatively, the radiation released is so powerful that it damages DNA and causes death and severe health defects throughout the entire lives of survivors as well as their children. Third, nuclear weapons make virtually impossible humanitarian assistance to survivors at the blast scene struggling to survive, leading to more suffering and death. Fourth, damage to the environment may produce not only devastating environmental harm itself but also widespread famine and starvation. Fifth, nuclear weapons cause long-lasting multi-generational psychological injury to survivors of the blast.'

[586] *Nuclear Weapons Advisory Opinion*, *ibid*, n.453.

very likely be an unlawful authorisation for this reason – not least an autonomous authorisation. Moreover, due to the fact that nuclear weapons are arguably the most destructive of all weapons, there use will almost always have catastrophic humanitarian and environmental consequences, whether they are used lawfully or unlawfully.

As a result, decisions regarding nuclear launch must remain in the hands of humans. This provides the reason for inserting the fundamental rule,

RULE 15
AWS must never be delegated decision-making responsibilities regarding the authorization of nuclear launch.

There will, no doubt, be opposition to the premise that it is possible to apply varying levels of MHC. However, such an argument will also very likely fail to endorse the reality, that in warfare, some decisions regarding the application of force will place a greater burden upon the commander than others.

As is argued consistently throughout this thesis, what is a sufficient level of MHC can vary depending upon the circumstances. Due to the unique destructive, and strategic, nature of nuclear weapons, the very highest level of human oversight *must* remain. This is merely an extension of the discussion first noted in the previous chapter, which identifies that strategy must remain an inherently human pursuit.[587]

One significant factor to consider is that while decisions regarding strategic weapon deployments should not be delegated to AWS, a human is not necessarily prevented from deploying an autonomous nuclear weapon (which, when considered in isolation, is a L1AWS). This is also true of other strategic munitions, and also of certain strategies. What qualifies as a strategic weapon may vary from state-to-state. Nonetheless, for the sake of the current analysis they are distinguished from strategic military *assets* such as aircraft carriers, and Missile Defence shields. This is because, (and as noted in the previous chapter) while these 'assets' are clearly weapons systems

[587] Generally, Gray, *ibid*, n.66.

in their own right, the authority to use them is implicit in the fact that they have already been deployed.

What is important for the sake of the *Template*, and specifically to L4AWS, is that under the circumstances, the deployment in question would typically require an executive order or some other kind of head of state (HoS) approval.[588] Any weapon which does not (but instead, for example, only required military commander approval), is classified as a L3AWS or below. A good example of a strategic weapon for the purpose of the present discussion is the U.S. large yield-bomb the GBU-43/B Massive Ordnance Air Blast (MOAB).[589] This is known colloquially as the 'mother of all bombs'.

Figure 18: The U.S. Massive Ordnance Air Blast (MOAB) bomb.

The destructive force of a MOAB (like any other explosive ordnance) cannot be applied to legitimate military objectives while distinguishing civilian objectives with the blast zone. In other words, it cannot distinguish. Therefore, with the blast radius of a MOAB being around 600 meters,[590] if a military objective was located in, or near to the civilian

[588] It may be difficult to positively identify which nations and weapons require head of state authorization. However, the point is, adopting such a rule would require an element of openness and clarification to reach an agreement.
[589] The MOAB was designed and produced in house by the United States Air force (USAF), and a factsheet is not available. Nevertheless, for further discussion relating to its destructive capabilities see, Anthony J Colangelo, 'The Duty to Disobey Illegal Nuclear Strike Orders' (2018) 9 Harv Nat'l Sec J 84, at n. 31. Here the author notes 'the MOAB has a greater explosive yield than a number of lower yield/ tactical nuclear weapons the US has fielded at various point over the years'. Also see, for example, Robert Bejesky, 'Deterring Jus in Bello Violations of Superiors as a Foundation for Military Justice Reform' (2015) 60 Wayne L Rev 395, 461, stating 'MOAB is a passenger-bus sized bomb that weighs 21,000 pounds, must be dropped from a C-130 cargo plane, and destroys everything within a 600-meter diameter blast circle.
[590] *Ibid*.

population, the potential for civilian casualties and damage would be extremely high. Indeed, the MOAB is so powerful, and the blast zone is so large, that the U.S. Pentagon Office has conducted its own investigation into whether the MOAB is (or is not) an indiscriminate weapon - concluding that it was not.[591] Nevertheless, (i) that the weapon itself cannot distinguish, and (ii) that the U.S. President has to authorise it use.[592] It is, in other words, a strategic weapon, and another example of one which a L4AWS must not have control over.

The precise nature of strategic weapons generally will need to be established by states wishing to adopt a legal framework to regulate the use of AWS. Nevertheless, the primary characteristic of RULE 15 will remain unchanged. That is, decisions regarding the deployment of strategic weapons must not be delegated to AWS. In the IHL sphere, this must be the case regardless of whether such decisions relate to means and methods that are used in attack, or in defence. Moreover, at least in the case of L4AWS, the fact that strategy must remain a human endeavour dictates that the rule applies regardless

[591], See, Robert Burns, 'US drops "mother of all bombs" on Islamic State tunnel' (*AP News*, 14 April 2017) https://apnews.com/339a792016c14f2d87e7f5b9fa8f3b2d/US-drops-%27mother-of-all-bombs%27-on-Islamic-State-tunnel accessed 2 September. The author identifies the 2003 Pentagon report which concludes that the MOAB is not an indiscriminate weapon because '[a]lthough the MOAB weapon leaves a large footprint, it is discriminate and requires a deliberate launching toward the target…[however]…[i]t is expected that the weapon will have a substantial psychological effect on those who witness its use".

[592] In April 2017 the U.S. dropped a MOAB in the mountainous region to the East of Afghanistan near the border with Pakistan and successfully destroyed a network of (so called) ISIS tunnels. See e.g., Robin Wright, 'Trump Drops the Mother of All Bombs on Afghanistan' (*The New Yorker,* 14 April 2020) https://www.newyorker.com/news/news-desk/trump-drops-the-mother-of-all-bombs-on-afghanistan accessed 2 September 2020, Tim Kelly, 'Mother of all bombs' targets Islamic State in Afghanistan' (*Reuters,* 14 April 2017), < https://uk.reuters.com/article/uk-usa-afghanistan-bomb-factbox/factbox-mother-of-all-bombs-targets-islamic-state-in-afghanistan-idUKKBN17G0WC> accessed 2 September 2020, and, 'MOAB strike: 90 IS fighters killed in Afghanistan' (*BBC News*, 15 April 2017) < https://www.bbc.co.uk/news/world-asia-39607213> accessed 2 September 2020. This is the first, and only known instance of the MOAB being deployed in 'combat'. Although the deployment and use of the MOAB was largely thought to have been sanctioned by U.S. President Donald J. Trump, the U.S. Commander who was actually responsible for doing do did not require, or indeed request and/ or receive presidential approval. See, 'MOAB Strike Didn't Need Trump's Approval, Officials Say' (*NBC News*, 15 April 2017) https://www.nbcnews.com/news/world/moab-strike-didn-t-need-trump-s-approval-officials-say-n746806 accessed 2 September 2020, and, Robert Burns, 'Officials: There was no need for Trump's approval for MOAB use' (*Military Times*, 14 April, 2017) https://www.militarytimes.com/news/pentagon-congress/2017/04/14/officials-there-was-no-need-for-trump-s-approval-for-moab-use/ accessed 2 September 2020. Instead, a delegated, Presidential pre-approval was given to use the MOAB, and it had existed since before President Trump had taken office. Therefore, there was an existing approval regardless of the fact that a new head of state was in position, regardless of huge destructive potential of the weapon, and regardless of the fact that the weapon was arguably used in a wider strategic manner to demonstrate U.S. military prowess, and a willingness to use it.

of whether the decision relates to force that is to be applied in either a kinetic, or non-kinetic manner. Therefore, as in the previous chapter,

L4AWS	Defence [D]	Offense [O]
Lethal [L]		
Non-Lethal [N]		

3.2.7 L3AWS and the Principle of Distinction.

This section considers L3AWS compatibility with the IHL principle of Distinction. As a reminder, L3AWS are defined as ***Command Operating Systems*** **which, once activated, are capable of operational level decision-making regarding battle planning and, of directing other systems accordingly (including human combatants).** And, as previously noted, existing command and control systems are potentially one of the primary areas where AI could have the greatest impact. Providing an element of the operation is quantifiable, it is potentially subject to algorithmic appraisal.[593] This appraisal can be particularly useful from a temporal perspective – with AI systems being capable of analysing huge amounts of information and intelligence at speeds far in excess of human capabilities.[594]

A L3AWS could also operate as a 'system-of -systems', and one which was able to command any number of formations, and/ or units – whether they be squadrons of autonomous warships, or battalions of infantry personnel (be they human combatants or humanoid robots), and much more besides. The *Template* classifies this type of *autonomous machine interaction* as a 'swarm'. This term is preferred, despite the fact that it is more generally used to refer to a network of similarly, or identically constructed platforms or munitions that operate in unison.

[593] Quantifiable features could include, for example, troop numbers/ formations, weapons systems locations, geographic features.
[594] See e.g., Brown, *ibid*, n.32, minute 4.45 - 5.15 noting that a typical MQ-9 Reaper drone surveillance sortie produces between 20-40 laptops worth of data. And what may, for example take a human 6 hours to assess at 4X speed, an AI can do in seconds or less.

The term swarm is equally suitable in this instance, because while the individual elements (the means and methods) that would be utilised by a L3AWS in 'control' of *Operation Island Storm* could vary significantly, they still 'act in sync towards a particular strategic goal'.[595] It is theoretically possible that a future L3AWS could complete an entire military *operation* independently.

If such a system-of-systems was available to an *Australe* commander, they might choose to activate it, and provide it with the relatively simple instruction, secure the island. Of course, any such order *must* be given under the assumption the L3AWS was capable of operating in accordance with IHL - which in turn implies that the AWS must *know* IHL. The IHL compliant L3AWS could then consider all of the relevant variables and *decide* upon the most appropriate course of action.

A system-of-systems of this variety could potentially reduce Clausewitzian frictions.[596] However, clearly, the more systems a L3AWS is comprised of, the more they may also introduce frictions of their own. An *Australe* L3AWS could gain control of the island without suffering a single human casualty, and without a need for a human to provide any further instruction. Prima facie, this would appear to be an exceptional result for *Australe,* and IHL certainly does not require for war to be fair.[597]

Critics argue, however, that the complete removal of humankind from the battlefield carries with it many inherent dangers. According to some, this is likely to include an increase in unnecessary harm and suffering because AWS 'lack emotions, including compassion and a resistance to killing, that can protect civilians and soldiers'.[598] In the case of swarms, however, as with all AWS such anxieties are largely misplaced because API already contains a number of stipulations to prevent such wide-spread autonomous deployments.

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[595] Grimal and Sundaram, *ibid,* n. 296, 109.
[596] See, *ibid,* n.461.
[597] This is perhaps best summarized by the manufacturer of an existing AWS, Uvision. With reference to their HERO series of robotic munitions, they state 'It's not about fair play, it's all about being superior'. See, 'HERO SERIES: Battlefield Game Changer, High Precision Loitering Munitions' (Uvision) https://uvisionusa.com/defense/ accessed 4 May 2021.
[598] See, HRW (2016), *ibid,* n.312, 25-26. Here the report argues, for example, that, '[h]umans possess empathy and compassion and are generally reluctant to take the life of another human…[thus]…[h]uman emotions are…an important inhibitor to killing people unlawfully or needlessly'.

In the first instance Article 51(4)(a) API identifies that an attack is indiscriminate if it is 'not directed at a specific military objective…[and/ or]…cannot be directed at a specific military objective.' The provision also states that amongst others, the following attacks are to be considered indiscriminate,

> 'an attack by bombardment by any methods or means which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians…' [599]

There are a number of issues to consider here in respect of applying Article 51(4)(a) to L3AWS. In the first instance, if a L3AWS was capable of distinguishing and of targeting only legitimate military objectives, it would be utterly different in character to that of say, a nuclear, or a chemical weapons attack which is what the provision appears to prevent. Second, with regard to Article 51(4)(b), it could also be argued that an attack with a "distinction capable" L3AWS is also very different to the total war /carpet bombing tactic that saw the British and German air-forces in particular drop hundreds of bombs upon large swathes of densely populated civilian territory WWII. Some might argue, therefore, that if a L3AWS was capable of distinction, this provision is of no use.

The drafters of the treaties could not have envisaged AWS. Consequently, in order for them to remain applicable to AWS deployments, they may sometimes need to be read sympathetically. For example, Article 51(5)(a) refers specifically to 'bombardment', which is a term that can, for example, be applied to the German and British aerial bombing campaigns of the second world war. However, the provision also ensures that must continue to apply to all methods or means that are to be used in a similar manner.[600]

The Oxford dictionary defines bombardment as 'a continuous attack with bombs, shells, or other missiles'.[601] And, the present researcher sees no reason as to why a this should be interpreted to include AWS. Attacks which treat a populated geographical

[599] Art. 51(3) and art.51 (4) API, *ibid*, n.43.
[600] The author is currently considering this hypothesis in greater detail elsewhere.
[601] 'Bombardment' Oxford Dictionary, *ibid,* n.87.

area as a single military objective are prohibited not least because they have the potential to inflict lasting physical, and physiological damage upon the civilian population.[602] This is, for example, true of autonomous munitions as much as it is non-autonomous variants. As a result, a commander with L3AWS at their disposal must be prevented from utilizing L3AWS O/L to target a general geographic area where civilians are located, in the 'hope' that it will locate and destroy a legitimate military target(s).

This becomes even more clear when the second major factor is considered – which is the recent international commitment to retain MHC over AWS. Indeed, it is very likely, and quite rightly so, that the vast majority of nations would not support the proposition that MHC is maintained where a commander is permitted to provide an AWS with a simplistic instruction such as 'secure the island' (or a remotely similar order). If this was ever the case, MHC would merely be an illusion due to the fact that there would be an almost infinite amount of battlefield decisions that could potentially be altogether removed from the human chain of command.

When these existing legal provisions are considered in light of these two vitally important factors, the Guiding Principles should reflect an interpretation which reads as follows: In relation to 51(4)(a),

RULE 16
Where L3AWS are delegated decision-making responsibilities regarding the authorization of pro-active attacks, a human operative must identify and verify each individual military objective.

Application of RULE 16 not necessarily mean a human has to identify each specific target. Instead, the rule merely reflects current targeting practice. This means for example, that munitions can be deployed to attack a 'group' of targets, such is the case with the British L1AWS Brimstone missile,[603] and, or 'types' of target, as does Israel's

[602] This is discussed in greater detail in Chapter Four in relation to art. 9 of the International Covenant on Civil and Political Rights (hereinafter ICCPR).
[603] See e.g., Brimstone, *ibid,* n.234.

autonomous munition (L1AWS) the Harpy Drone,[604] and the U.S. Long Range Anti-Ship Missile (LRSAM) – additionally an existing L1AWS.[605] This is indicated in the following,

RULE 17
A commander may pre-authorise and deploy an AWS to attack a group of targets, and/ or type of target.

Article 51(4)(b) does not require a great deal of further interpretation - the rule simply restating the existing obligation that,

RULE 18
When deployed in a pro-active manner an AWS must not employ a method or means of combat which cannot be directed at a specific objective.

Perhaps most importantly, however, for the sake of the discussion relating to all-out autonomous warfare, the rule relating to 51(5)(a) provides that,

RULE 19
An offensive attack with the use of an AWS will be considered indiscriminate where the human operative responsible for authorizing its use, treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects.

These rules ensure a commander is prevented from providing an AWS with the instruction merely to 'secure the island'. Instead, each L3AWS decision to deploy a further AWS must identify a specific target, group of targets, or type of target – the point being that any system deployed by L3AWS worked only towards achieving a

[604] The Harop, *ibid,* n.465, is also referred to as the Harpy 2. See also, 'Harpy: Autonomous Weapon for all Weather' (IAI) https://www.iai.co.il/p/harpy accessed 9 July 2021. For a useful discussion also see, Scharre, *ibid,* n.20, 46-56.
[605] LRASM, *ibid,* n.458.

single tactical goal. This means that although there is no restriction upon the number of further autonomous systems that a L3AWS can deploy, every element of the attack *must* be identified and authorised by a human commander. This prevents, any AWS that would be deployed by a L3 operating system from joining another element of an attack without first receiving human authorization from command and control, or from another designated human 'on the ground'.

In order to ensure MHC over L3AWS, the following rule is also annexed,

RULE 20
Where a military force authorises L3AWS to direct human combatants to carry out pro-active attacks, the human military personnel must be made aware of the autonomous nature of the order, and must also be permitted to refuse an order where he or she believes that there is a genuine reason to do so. [606]

RULE 20 is necessary because a human soldier cannot have MHC over their own decision-making capability, if he or she is unconditionally bound to follow all orders passed down to them from a commanding officer - for which a L3AWS is a direct replacement.[607] When these rules are considered alongside the specifics that were presented in scenario III, and in light of L3AWS – which, as a reminder is the classification the *Template* affords to swarms – the following effects materialize. First, an armed drone-swarm could be deployed to attack *Orientale's* military aircraft located at the airfield, and potentially to destroy the runway. Another system might be directed to an *Orientale* air-force command centre located at the airfield, and another to target the airfield's aviation fuel silos. However, a human commander must not instruct a L3AWS only to 'secure' the airfield, completing ignoring the fact, for example, that it is a mixed-use complex.[608]

[606] The point is, that while there is a customary duty to disobey a manifestly unlawful order, a subordinate is typically required to follow orders – though there is some variation between states as to which types of orders should be disobeyed. See, Grimal and Pollard (2021), *ibid,* n.4 where the present author considers this in greater detail and analyses how, for example, AI might be used to assist human decision making in this area.
[607] *Ibid.*
[608] That is not to say that there could not be civilian casualties – just that they must, as a minimum, be subjected to proportionality assessments (this is discussed in greater detail in Part Two of the current chapter).

A L3AWS could, however, authorise a number of autonomous naval vessels to support the pro-active airfield attack, including, for example, an autonomous aircraft carrier from which further AWS could be deployed. Such a naval operation might include an autonomous amphibious assault ship, from which an autonomous landing craft, laden with autonomous armoured ground vehicles was deployed - again in a pro-active manner. While this version of operation island storm arguably utilises just as much autonomy as would have been necessary to fulfil the 'secure the island' order, the rules relating to the principle of distinction ensure that the operation can be conducted with appropriate levels of MHC.

While the majority of the rules regarding distinction should apply equally to both spectrums on the [D]/[O] axis, there should be some dispensation to RULE 16 relating to the identification and authorization of individual targets. This is because there will very likely be instances where a L3AWS should be permitted to authorise a sequence of re-active attacks without first seeking human authorisation. This could be in the event of a loss of communications due to an offensive action taken by an adversary (either lawfully or unlawfully), but where there is an imminent threat, and/ or risk to the civilian population. The result RULE is as follows,

RULE 21
Where a L3AWS is delegated decision-making responsibilities regarding the authorization of pro-active attacks, a human operative must identify and verify each individual military objective. This principle applies to a L3AWS acting in a re-active manner, unless circumstances dictate that human authorization is not possible. Where such a situation arises, and providing acts are limited to those of a re-active nature, a temporary moratorium may be applied to this rule insofar as it is immediate and necessary.

One final point regarding L3AWS relates to the [L]/[N] axis. Thus far, the discussion in this section has intentionally focused upon the lethal force spectrum [L] – to which all of the above rules are applicable. Nevertheless, when a L3AWS is delegated, decision-making responsibilities relating to the application of non-lethal force [N], such restrictions are unnecessary. Instead, insofar as a non-kinetic application of force is concerned,

RULE 22
L3AWS may authorise actions which have not been directly pre-defined by a human commander under the condition that an any action which is likely to result in permanent damage to objects adhere to the principle of distinction, and/or where no damage is likely to occur as a result of the attack.

Such an attack could, for example, take the form cyber-attack that was designed to cause permanent physical damage to a nation's information technology infrastructure in order to disrupt its state broadcasting capabilities. The reasons for supporting this position are discussed in greater detail Chapter One, but primarily it is because the main opposition to AWS is appropriately focused upon life-or-death decision-making. This is also relevant to the additional related rule which provides,

RULE 23
L3AWS may authorise indiscriminate non-lethal actions which have not been directly pre-defined by a human commander, providing no physical damage is caused, or where physical damage caused is temporary in nature.

Due to the fact that these rules do not relate to the method of inflicting harm directly upon an adversary, these final two rules apply equally to a L3AWS acting upon either the [D] and [O] spectrum.

The final two rules presented in the above paragraph complete the analysis in respect of L3AWS and IHL principle of distinction. As the following two sections demonstrate much of the discussion in this section is also relevant to L2AWS and L1AWS. Nevertheless, the ideology that is contained within the examination above can be summarised as follows. Where a L3AWS [L]/[O] is delegated the decision-making responsibility to authorise an attack/or attacks, a human operator must identify and verify individual military objectives. This principle also applies to a L3AWS [L]/[D], except where circumstances dictate that human authorization is not possible.

In such a case, and providing all actions are limited to those that are re-active in nature, a temporary moratorium of this rule will be tolerated, providing there is sufficient evidence to demonstrate that the imposition of such is both immediate and necessary.

In contrast a L3AWS [N]/[D] and L3AWS [N]/[O] may authorise attacks against military objects which have not been directly pre-defined by a human commander, providing such attacks adhere to the principle of distinction, or where no damage is likely to occur as a result of the attack. Moreover, an L3AWS [N]/[D] and L3AWS [N]/[O] may apply a non-lethal force indiscriminately to objects where 'damage' caused only temporarily.

Where L3AWS [L]/[O] are deployed, it/ they must not employ a method or means of combat which cannot be directed at a specific military objective. And, in furtherance of this principle, any act which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects is considered indiscriminate. Finally, should a L3AWS direct human combatants, adherence to the concept of MHC requires that those combatants are made aware of the autonomous nature of the order, and that they must be permitted to disobey it where they harbour a subjective believe that there is a genuine need to do so (for example to comply with IHL). This summary is distilled further in the table below, which represents the foremost of the principles regarding L3AWS and distinction. In addition, this is completed with a graphical representation of the GPs that regulate the lawfulness of swarming AWS,

(cont.)

L3AWS	Defensive [D]	Offensive [O]
Lethal [L]	• Temporary moratorium may be placed upon the rule requiring human identification and verification of objectives where human authorization is not possible under the prevailing circumstances.	• A human commander must identify and verify targets. • Commander must not employ a method or means which cannot be directed at specific objective. • A specific objective is NOT a number of clearly separated & distinct objects. • Where a L3AWS provides order to humans, those humans must be made aware of autonomous nature of order, and must be permitted to refuse such an order if necessary.
Non-Lethal [N]	• L3AWS may authorise attacks that cause damage to objects that have not	• L3AWS may authorise attacks that cause damage to objects that have not

	previously been identified by a human commander providing they adhere to distinction. • L3AWS may authorise indiscriminate attacks where no damage is caused, or 'damage' to objects is only temporary.	previously been identified by a human commander providing they adhere to distinction. • L3AWS may authorise indiscriminate attacks where no damage is caused, or 'damage' to objects is only temporary.

Figure 19: A Summary of the Rules Relating to L3AWS and the Principle of Distinction.

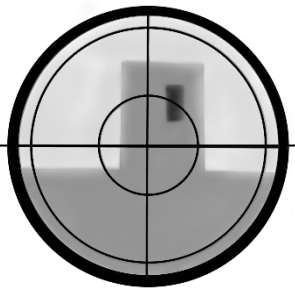
(cont.)

Regarding the Lawfulness of Swarming AWS Under the *jus in bello*.

A: Has a lawful Target been Pre-identified by a Human Prior to AWS Deployment?

B: Category of AWS, the use of which is potentially lawful given the circumstances.

(I) Target has been pre-identified by a human operative prior to AWS deployment, and target is considered lawful under contemporary IHL standards.

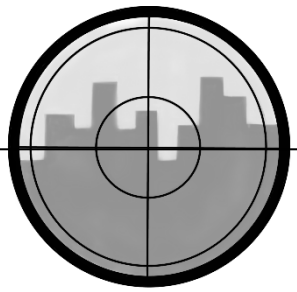


Swarming Munitions: Individual Elements of the swarm are destroyed when force is applied (single use only).

Swarming Platforms: Individual elements of the swarm are recoverable weapons platforms (though not necessarily identical). Swarm must not independently identify and engage additional targets. (Note however):

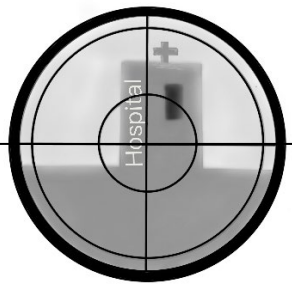
Where swarming platforms are capable of independently completing the four stages of the OODA loop, the system must be considered under pathway II.

(II) Target has not been preidentified by a human operative prior to AWS deployment.



Defensive Lethal (D/L) and Offensive Non-lethal (O/N) Operational Swarms: Operating as a system-of -systems - individual elements of the swarm may be both tangible and non-tangible. Swarm is capable of independently altering its course of action based upon intelligence gathered by the group.

(III) Target has been pre-identified by human operative prior to AWS deployment, but is not considered lawful under contemporary IHL standards.



AWS deployments prohibited.

Figure 20: The *jus in bello* Lawfulness of Swarming AWS.

3.2.8 L2AWS and the Principle of Distinction.

With continued reference to scenario III, the following section examines whether L2AWS can operate in adherence with the IHL principle of distinction. As a reminder, a L2AWS is defined as **recoverable *Weapons Platforms* which, once activated, are capable of identifying, selecting and, engaging targets (or not) free from further human coercion, though not necessarily from human supervision**. A L2AWS could take the form of a battle tank.[609] Though L2 classification would also be afforded to a larger platform such an autonomous version of a Vanguard nuclear sub-marine.[610] In contrast, L2AWS also encapsulates future weapons systems such as humanoid robots. Indeed, due to the fact that provocative images are often used by the mainstream media when reporting on AWS,[611] it is fair to say that L2AWS are perhaps the most mis-understood, and controversial of all *Template* classifications.

[609] For a useful discussion regarding the operational capabilities of Russia new battle tank, and indeed how it compares to western military hardware, see, Will Flannigan, 'Facts over Fear, T-14 Armata' (*The Wavell Room*, 19 February 2019) https://wavellroom.com/2019/02/19/facts-over-fear-t14-take-the-threat-seriously/ accessed 9 September 2020. Also see, Marie Boren, '"Killer robots" are not science fiction - they're here' (*The Irish Times*, 11 July 2019) https://www.irishtimes.com/business/innovation/killer-robots-are-not-science-fiction-they-re-here-1.3951632 accessed 9 September 2020. The author suggests that the T-14 is 'rushing' towards full autonomy.

[610] For a Vanguard factsheet see, The Future of the United Kingdom's Nuclear Deterrent: Factsheet 4, (*Ministry of Defence & Foreign and Commonwealth Office)*, https://fas.org/nuke/guide/uk/doctrine/sdr06/FactSheet4.pdf accessed 9 September 2020.

[611] Images of the red-eyed humanoid 'killer robots' from the Terminator movie franchise is perhaps the one that is most widely utilised by the mainstream press when considering AWS. See e.g., Tracy McVeigh, 'Killer robots must be stopped, say campaigners' (*The Guardian*, 23 February 2013), < https://www.theguardian.com/technology/2013/feb/23/stop-killer-robots> accessed 30 September 2020, Sally Hayden, 'Killer robots are almost inevitable, former defence chief warns' (*The Independent*, 27 August 2017 https://www.businessinsider.com/killer-robots-are-inevitable-warns-former-defence-chief-2017-8?r=US&IR=T accessed 30 September 2020, Killer robots: Jai Galliott, 'Why banning autonomous weapons is not a good idea' (*ABC News*, 30 August 2018) < https://www.abc.net.au/news/2018-08-31/killer-robots-weapons-banning-them-is-not-a-good-idea/10177178> accessed 30 September 2020, and, Sarah Knapton, 'Killer robots will leave humans utterly defenceless' warns professor' (*The Telegraph*, 27 May 2015) < https://www.telegraph.co.uk/news/science/science-news/11633838/Killer-robots-will-leave-humans-utterly-defenceless-warns-professor.html> accessed 30 September 2020.

Figure 21: The Russian advanced, though traditional 'platform', T-14 'Armata' AFV.

Figure 22: An additional platform in the traditional sense -The British Vanguard Class of Nuclear Submarine.

A L2AWS may, of course, be a component of a L3AWS. And, as noted in Chapter One, where this is the case the classification is 'rounded up'. This section is predominantly concerned with *isolated* deployments of L2AWS systems – that is, platforms which have been ordered by a either a human commander, or by a L3AWS, to attack a target, a group of targets, or a type of target. As has already been established, where civilians or civilian objects are located, all AWS must be capable of operating in accordance with distinction - or of withdrawing where they are not.

Even with these existing obligations in place, one of the primary opposition arguments is that in a wide variety of circumstances, AWS, and particularly L2AWS,[612] will be unable to distinguish. Indeed, although distinction is perhaps the most well-established of all IHL principles, this is one of the leading lines of reasoning for those who support of a prohibitive treaty. The primary argument offered is that current technology, and indeed, medium-term technology, is unlikely to be sufficiently advanced for it to allow AWS to make a distinction, in the fog of war, between lawfully targetable combatants and the groups of individuals noted above [613] i.e., children in or around the battlefield playing with toy guns,[614] civilians *DPHing* (or not),[615] and those *hors du combat.*[616]

The rules identified thus far leave no doubt as to the fact that an AWS operating in an environment where such mistakes might occur must be capable of making distinction assessments. However, perhaps crucially, no one in support of AWS is suggesting that the strategic, and humanitarian, benefits of AWS should be harnessed if they are incapable of conforming to established international legal standards.[617] Instead, in order to harness the benefits of AWS, [618] their development should be permitted, as should their deployment, where civilians and civilian objects are not present.

In terms of both DPH, and *hors du combat*, a discussion that is routinely overlooked (or one that is at the very least brushed over), is the fact that distinction is not an *absolute* requirement. As a result, a commander adhering to the rules identified is not prevented from authorizing tactical deployments of L2AWS to an environment where

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[612] Clearly, the existing literature does not refer directly to L2AWS because this classification is unique to this thesis.

[613] See, HRW (2012), *ibid*, n.15, 30. Here the report states: 'autonomous weapons would not have the ability to sense and interpret the difference between soldiers and civilians'. Also see, HRW (2015), *ibid*, n.191, 8 stating: 'autonomous weapons would face great, if not insurmountable, difficulties in reliably distinguishing between lawful and unlawful targets as required by international humanitarian law.' This is also repeated verbatim in, HRW (2016), *ibid,* n.312.

[614] HRW (2012), *ibid,* n.15, 31. Provisions are in place to attempt to prevent children from being used as soldiers, see e.g., Optional Protocol to the Convention on the Rights of the Child on the involvement of children in armed conflict (2000). However, IHL does not place age restrictions on targets. If a child was carrying a real gun with the intent to use it, either as a combatant, or as a civilian playing a direct part in hostilities, they would be lawfully targetable (subject to the exceptions noted in this sections discussion).

[615] See, discussion, *ibid,* 3.2.3.

[616] See, discussion, *ibid,* 3.2.4.

[617] Sassoli, *ibid*, n.39, 311-312.

[618] As attested to in the previous chapter, 'human supervised' AWS have not operated with a 100 per cent success rate as far as distinction is concerned with passenger airlines and friendly forces having been previously targeted and destroyed as a result of mis-identification. Nevertheless, as previously argued, current tech and indeed autonomous technology in particular, can remove a number of negative human elements such as fear, and mistrust, and thus can help to prevent a reoccurrence.

no civilians, or (a minimal amount) belligerents are present.[619] This is clearly because, in such environments, there is little-to-no-need to distinguish civilians or civilian objects from military objectives.

To that end, one way a *Australe* commander could choose to utilise a L2AWS in an offensive manner [O] would be authorise the use of an armed military satellite that was capable of engaging other platforms such as enemy communications satellites, and/ or aircraft. Conversely, if there was sufficient intelligence regarding the lack of a civilian presence in the mountainous region to west of *Orientale*, a commander might also choose to deploy an autonomous platform there.

Indeed, a L2AWS [O] might be a member of a forward operating special forces group that was tasked with gathering the intelligence that was needed to support the decision to authorise further L2AWS [O] deployments. The advantages of deploying AWS in this regard are numerous, but most certainly include the fact that a L2AWS [O] could be positioned in a dedicated observation post for much greater periods of time than even the most dedicated special forces operative and would not need to move and perhaps risk detection.

An *Orientale* commander might choose to deploy L2AWS in a defensive/ reactive manner [D]. When used this way, a commander is most unlikely to be certain about the specific targets/ types of target / groups of targets the L2AWS [D] will be required to engage. And, for reasons already discussed, including the fact that the majority of opponents look only to prohibit offensive systems, greater targeting leniency should be provided to AWS that are used in a defensive manner. This is particularly the case where they are used to protect combatants and civilians from otherwise unlawful applications of force.

That being the case,

[619] In this respect the author envisages individuals such fighter jet pilots, who, while actively engaged in flight or fight, are very unlikely to meet the parameters for *hors du combat* set out in art. 41(2) API, *ibid,* n.43.

RULE 24
A L2AWS D may authorise attacks that cause damage to objects that have not previously been identified by a human commander. Such attacks must adhere to the principle of distinction.

In addition, and once again for reasons considered previously,

RULE 25
L2AWS may authorise indiscriminate attacks where no damage is caused, or where damage to objects is only temporary. *See also*: RULES19 and 23.

In addition, the following general rule is annexed,

RULE 26
Where an AWS is required to carry out a distinction assessment, but it is unable to do so, civilian status must be presumed, and the AWS must be capable of refraining from taking further action. An acceptable course of action may be aborting the mission entirely, or the AWS may continue its assigned mission once the need to distinguish has passed.[620]

Note that in contrast to the *jus ad bellum*, (armed) attacks are not prohibited by IHL. Thus, offensive deployments are acceptable providing that are compatible with the RULES identified in the current chapter, and wider legal obligations.

[620] For a discussion regarding the presumption of civilian status where there is doubt, see generally e.g., Mirriam, *ibid*, n.550, and Grimal and Pollard (2020), *ibid,* n.4.

L2AWS	Defence [D]	Offense [O]
Lethal [L]	☑	☑
Non-Lethal [N]	☑	☑

3.2.9 L1AWS and the International Humanitarian Law Principle of Distinction.

The final *Template* classification that is considered in this section is L1AWS. The Template defines L1AWS as, **single use *Munitions*, which, once activated, are capable of identifying, selecting and, engaging targets (or not) free from further human coercion, though not necessarily from human supervision**. A L1AWS may be launched or fired by a human operative, or by a L2 or L3AWS. To ensure clarity, "single use" refers to the fact that a L2AWS cannot be recovered after it has discharged its payload, whether that be a kinetic, or a non-kinetic force such as a cyber/ logic bomb.[621] Where the payload is not discharged, however, it may be possible to recover and re-use a munition.

Many examples of L1AWS have been presented in the previous two chapters. However, by way of a reminder, a L1AWS could, for example, be a *smart* grenade such as that which was considered in Chapter One. Although such a weapon does not currently exist, if developed it might resemble an existing grenade, but with an added facility to be able to alter or withhold its explosive charge to reduce or avoid collateral damage.[622] It may achieve this, for example, by utilising inbuilt cameras, sensors, RADAR, LIDAR, and pre-determined, pre-programmed criteria. L1AWS classification would also be afford to an over-the-horizon munition such as a medium

[621] See, Laura Fitzgibbons, 'Logic Bomb' (Tech Target) https://searchsecurity.techtarget.com/definition/logic-bomb accessed 9 July 2021. Here it states, 'A logic bomb, sometimes referred to as slag code, is a string of malicious code used to cause harm to a network when the programmed conditions are met. The term comes from the idea that a logic bomb "explodes" when it is triggered by a specific event. Events could include a certain date or time; a particular record being deleted from a system or the launching of an infected software application.'

[622] IHL does allow some level of 'Collateral damage'. This is considered in greater detail in Part 3 of the present chapter in regard of IHL proportionality.

range tactical ballistic missile.[623] An autonomous version of such a weapon could, for example, choose to abort if it detected that civilians were located within a predetermined kill-zone that had not been identified by a human combatant at the time of launch.

There can be no argument that where AI technology is used in such a manner, L1AWS have the potential to save lives, and unnecessary damage to civilian objects. Such uses are, however, clearly highly dependent upon the AWS being able to operate in accordance with the principle of distinction. Significantly, the decision to deploy less advanced L1AWS can be taken by a human operative, as is the case with Israel's Harpy drone.[624] Moreover, where this happens, there is arguably an element of MHC.[625] While this may not be the case for every deployment, it is at least possible. Thus, L1AWS cannot be identified as being inherently unlawful.

In some respects, the Harpy munition is 'cutting edge'. Nevertheless, its ability to distinguish is very limited. It, and other autonomous munitions such as the PAC-3, do provide a reasonable indication of the competence (or not) of existing autonomous battlefield technologies with regard to operating in full adherence to the finer elements of distinction such as DPH and *hors du Combat*. And it is for that reason that

RULE 27
AWS are prohibited from treating humankind as a target, type of target, or a group of targets.

Rule 27 is required because of the current technological shortcomings surrounding autonomous positive identification, and also because it prevents an AWS from being programmed to engage an individual based upon a classification or category. This is

[623] Although, as per the discussion in Chapter One, any munition that was capable of independently completing the four tasks of the OODA loop would be considered an AWS.
[624] See, Harpy, *ibid*, n. 604. The Harpy's manufacturer, Israel Aerospace Industries Ltd. identifies the Harpy as, 'a "Fire and Forget" autonomous weapon, launched from a ground vehicle behind the battle zone.'
[625] As previously noted, the concept of MHC is intertwined with the discussion regarding human accountability for AWS. This is discussed in greater detail throughout the remainder of this work, and in particular in Chapter Six. However, the point here is, currently a human is responsible for assessing the operational parameters of every Harpy deployment, and the environment into which it is sent. This is clearly very different, for example, to a L3AWS Harpy authorization. For an overview of MHC see, the discussion in 1.3.8.

the concern of many in opposition to AWS, including for example, HRW who argue that someone might simply instruct an AWS to engage individuals such as males, between the age of 18-50, and with an online presence linked to a particular organization. [626] Nevertheless, L1AWS cannot be identified as inherently indiscriminate, thus,

L1AWS	Defence [D]	Offense [O]
Lethal [L]	☑	☑
Non-Lethal [N]	☑	☑

3.2.8 Part 2: In Sum.

Part 2 was primarily focused upon conducting a comprehensive investigation into the lawfulness of AWS – in accordance with the IHL cardinal principle of distinction. The present researcher intentionally veers away from technical discussions about what may or may not be possible in terms of future autonomous capabilities. Nevertheless, there is no denying the fact that AWS are currently, and by some distance, incapable of adhering to the principle of distinction under all battlefield environments. Be that as it may, this section has identified that use of AWS in armed conflict is not altogether ruled out. Indeed, states will continue to deploy "basic" AWS into environments where no, or very few civilians and/ or combatants are present. It is simply not possible to accurately predict the levels of machine decision-making capability in 10 years' time, let alone 20-50 years'. However, it is highly likely future systems will continue to become *more* adept at distinguishing people and objects.[627] With that in mind, future

[626] See, Slaughterbots, *ibid*, n.209.

[627] Humankind has consistently increased its reliance upon robotic systems. They are now used in a variety of environments, civil and military, quite simply because they can complete the task that has been assigned to them better than humans can. See, the three D's, *ibid,* n.9. Robotic systems are able to work in extremely harsh environments, with more accuracy, and with processing speeds far in advance of human capabilities, and these technological advances are leading us towards the human becoming the weakest link. Robotic systems can be connected in real-time to a much larger digital network. They do not require healthcare, pensions, holidays or even rest. For these reasons it is very unlikely that investment will cease. Insofar as the tech relating to the principle of distinction, AI Global corporation giants, such as Microsoft, Apple and Google are investing heavily in AI recognition software and machine learning See e.g., < https://www.cbinsights.com/research/top-acquirers-ai-startups-ma-

teleological developments may also be likely to lead to a *greater* adherence to IHL, including to the principle of distinction. [628] As a result, the development of AWS should be allowed to continue subject, *inter alia*, to the rules which are identified throughout this body of research.

PART 3. Fundamental Principles of IHL: Proportionality.

Part 3 continues the analysis of AWS in regard of a second fundamental IHL principle – proportionality. [629] As previously, the legal base for this principle is first identified before the focused analysis is conducted with due regard of the *Template*. Nevertheless, the following discussion will demonstrate why distinction and proportionality are said to fit together like hand-and-glove. Part 3 will demonstrate this is the primary reason why the researcher adopts the same position in regard of proportionality, as was applied in part 2.

3.3.2 IHL Proportionality in Law.

Despite its standing as a fundamental principle of IHL, proportionality is not explicitly referred to in the treaties. Instead, it is distilled from following paragraph,

> [w]ith respect to attacks, the following precautions shall be taken…those who plan or decide upon an attack shall…refrain from deciding to launch any attack which may be expected to cause incidental loss of life, injury to civilians, damage to civilian objects, or a combination

timeline/> accessed 20 March 2018. In other words, whether military of civilian, considerable advancements in recognition software are inevitable. Ultimately, machines will be able to distinguish faster, with greater accuracy, at a greater distance, while remaining unaffected by hostile environmental conditions.

[628] The primary point here is greater adherence to the principle of distinction will save human lives. See, e.g., Sassoli, *ibid,* n.39, 328. Here the author states 'I simply do not see any reason of principle why a machine could never become better at fulfilling this task than a human being', Also see, Schmitt, *ibid*, n.42, 16-17 stating the 'development of an algorithm that can both precisely meter doubt and reliably factor in the unique situation in which the autonomous weapon system is being operated will prove highly challenging. After all, artificial intelligence is artificial.' He continues, however, 'algorithms attributing values to sensor data, thereby enabling the autonomous weapon system to compute doubt (or, since it is a machine, the likelihood of being a lawful target), are theoretically achievable.'

[629] Noting once again that *the jus in bello* proportionality must be differentiated from the *jus ad bellum* principle that shares the same name.

thereof, which would be excessive to the concrete and direct military advantage anticipated.[630]

There is a similar, though not identical, reference to proportionality in Article 51(5)(b) API.[631] The most significant aspect here is proportionality does not prohibit attacks which have the potential to cause civilian harms. Instead, its purpose is to limit civilian harms to an *acceptable* level where they simply cannot be avoided. In other words, proportionality 'protects the proximate civilians and civilian property from the incidental or collateral effects of the attack on a lawful target'.[632] Article 8(2)(b)(iv) of the Rome Statute provides that it is a war crime to carry out a disproportionate attack[633] Proportionality is customary in nature. [634]

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[630] See, art. 57(2)(iii) API, *ibid*, n.43. The full text of article 57 which relates to 'Precautions in Attack', states: '1. In the conduct of military operations, constant care shall be taken to spare the civilian population, civilians and civilian objects. 2. With respect to attacks, the following precautions should be taken: a) those who plan an attack shall: (i) do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives within the meaning of paragraph 2 of Article 52 and that it is not prohibited by the provisions of this Protocol to attack them, (ii) take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects, (iii) refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, (b) an attack shall be cancelled or suspended if it becomes apparent that the objective is not a military one or is subject to special protection or that the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, (c) effective advance warning shall be given of attacks which may affect the civilian population, unless circumstances do not permit. 3. When a choice is possible between several military objectives for obtaining a similar military advantage, the objective to be selected shall be that the attack on which may be expected to cause the least danger to civilian lives and to civilian objects. 4. In the conduct of military operations at sea or in the air, each Party to the conflict shall, in conformity with its rights and duties under the rules of international law applicable in armed conflict, take all reasonable precautions to avoid losses of civilian lives and damage to civilian objects. 5. No provision of this Article may be construed as authorizing any attacks against the civilian population, civilians or civilian objects. See also Article 51(5)(b) API.

[631] See, art. 51(3) API, *ibid,* n.43. But note, at least with regard to identifying the principle of proportionality, art. 57(2)(iii) API, and art. 51(5)(b) API are indistinguishable.

[632] Geoffrey Corn, Ken Watkin and Jamie Williamson, *The Law in War: A concise Overview* (Routledge 2018), 152.

[633] Article 8(2)(b)(iv) Rome Statute, *ibid*, n.14 states, [For the purpose of this statute, a 'war crimes' is:] Intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated (which is also referred to as an attack which causes excessive collateral damage).

[634] ICRC Customary Rule 14, *ibid,* n.518 noting, 'Proportionality in attack. Launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited. State practice establishes this rule as a norm of customary international law applicable in both international and non-international armed conflicts'

As the author has posited elsewhere, proportionality seeks to ensure IHL performs its critical function of balancing humanitarian needs with military necessity.[635] These two concepts are represented in Article 57(2)(iii) by civilian harms, and military advantage respectively. [636] Proportionality is an acknowledgement that despite distinction, civilians are still inevitably killed in war.[637] Indeed, 'proportional civilian collateral damage stemming from the targeting process is acceptable...'[638]

Proportionality, or, collateral damage assessments, must be made on a case-by-case basis by military decision-makers – be they a rifle firing private, a tank commander, or a military-general authorizing a large-scale airstrike. Where a decision-maker 'reasonably assesses' that no civilian harms will be caused by a lawful attack on a military target, there is no need for them to consider proportionality.[639] This matter is crucial in terms of assessing the lawfulness of AWS. Because AWS will not always have to make collateral damage assessments. Thus, they clearly cannot be identified as inherently unlawful.

Where either an AWS or a combatant is required to consider proportionality, the effects of the attack upon the civilian population in the immediate target area, and in some instances, the wider civilian population, must be taken into account.[640] Ultimately, a

[635] The present author does seek to support armed conflict *per se but* recognise and indeed support the need to balance military necessity with humanitarian protections where war does take place. As noted by Dinstein, *ibid,* n. 244, xii '[s]hould nothing be theoretically permissible to belligerent parties, ultimately everything will be permitted in practice - because the rules will be brushed aside'. Also see the present authors discussion in, Grimal and Pollard (2021), *ibid*, n.4, 12.

[636] See e.g., Dinstein, *ibid*, n.244, para.425. The ICRC have suggested that the military advantage must be substantial, see e.g., J. Pictet, Hans-Peter Gasser, Sylvie-So Junod *et al,* 'Article 57', ICRC commentary on the additional protocols 677, 684. Noting that Dinstein, *ibid*, n.244, para 430 argues that the ICRC is misguided, and that instead, the advantage 'must be concrete, that is to say, it must be particular, perceptible and real as opposed to general vague and speculative'.

[637] Hilly Moodrick-Even Khen 'Reaffirming the distinction between combatants and civilians: The cases of the Israeli Army's "Hannibal Directive" and The United States' Drone Airstrikes Against ISIS' (2016) 33 Ariz. J. Int'l & Comp. L. 765, 777.

[638] Yishai Beer, 'Humanity considerations cannot reduce war's hazards alone: revitalizing the concept of military necessity' (2015) European Journal of International Law 801, 807.

[639] Corn *et al*, *ibid,* n.632.

[640] The military commander may have to consider the wider cost of the destruction of civilian property, possibly even the lives of the individuals outside of the immediate battlefield, for instance in term of refugees and asylum seekers. See e.g., 32nd International Conference of the Red Cross and Red Crescent: International humanitarian law and the challenges of contemporary armed conflicts (ICRC, 2015), 5 noting that '[t]he devastation caused by violence has prompted increasing numbers of people to flee their communities, leaving their homes and livelihoods behind and facing the prospect of long-term displacement and exile. The number of internally displaced persons (IDPs), refugees and asylum seekers uprooted by ongoing armed conflicts and violence worldwide has soared in the past two years. In 2013, for the first time since the Second World War, their total number exceeded 50 million people, over half of whom were IDPs. This negative trend continued in 2014, as conflict situations deteriorated.'

military commander must consider proportionality when designing his overall battle strategy.[641] If civilian harms are likely to be too high in comparison to the anticipated military advantage, the attack must not take place.

3.3.3 Proportionality and Autonomous Weapons Systems.

The following section considers how the principle of proportionality might affect how a commander could lawfully deploy AWS upon the battlefield. In order to do so, the discussion returns to the specifics that are contained within scenario III, and assesses them in light of the *Template*. This analysis starts by considering the *Template* in regard to a *Australe* attack on the sparsely populated region to west of the island (attack 1). This is followed by an additional analysis considering a second *Australe* attack upon a legitimate military target located in a downtown area of the densely populated heart of the city *Orientale* (attack 2).

Before moving on to consider attacks 1 and 2, it is first important to note,

RULE 28
IHL proportionality is applicable to AWS (noting that proportionality can be applied either by the decision-maker responsible for authorizing AWS deployments, or, by the AWS itself).

Although a small number of AWS that are currently deployed are able distinguish military targets from civilian objects,[642] no existing weapons are capable of operating in full adherence to proportionality. Therefore, the following analysis is focused largely upon hypothetical future technologies – though, as previously, the researcher does not wish to pursue a line of enquiry regarding the possibilities (or not) of such tech ever materialising.

3.3.4 Attack 1.

If an *Australe* commander was able to reasonably assess that no civilian harms would be caused by launching a lawful attack on a legitimate military target located in the

[641] See e.g., HRW 2016, *ibid*, n.312, 5.
[642] See e.g., LRASM, *ibid*, n.458. This munition, for example, can bypass civilian vessels because they do not send out a radar signal which is only use by combat vessels.

mountainous region, they could deploy any number of weapons – including, where they had access to such, an AWS. These could be a munition such as an autonomous ICBM. Where no civilians are present, the AWS can be deployed *not* because the commander has made a proportionality assessment (and therefore that the ICBM does not need to) - but rather, neither the commander, nor the ICBM are required to make a proportionality assessment.[643]

Regarding attack 1, the overall analysis has already provided that an *Australe* commander is prohibited from deploying a L4AWS. Where no civilian harms will result, a *Australe* commander would be permitted to deploy L3AWS O/K at targets in the mountainous territory, provided each target is pre-identified and authorised by a human. Noting, that were a lawfully deployed L3AWS to come under attack from a source that had not been previously identified by a human, a temporary moratorium in placed upon the rule so that the L3AWS can use force to defend itself.

The commander may also deploy an a L3AWS O/N swarm at targets not previously identified, providing no damage is caused, or that damage is only temporary. Such a system, may for example, be utilised to jam *Orientale* defensive radar signal, and/ or satellite installations. The same rules are applicable to L2AWS and L1AWS as were noted above. Therefore, these systems must not identify humanity as a single target. In addition, they must be capable from withdrawing from an attack if they are operating in manner in which an *hors du combat* assessment becomes necessary, where the AWS is incapable of carrying out such assessments. Finally, L1 and L2AWS must only be used for tactical purposes, meaning a L2AWS must not be capable of instructing or manipulating other 'friendly' systems without human intervention, or authorisation.

The point here is that an AWS may not be required to make proportionality assessments where it is deployed into a sparsely populated geographical region. Although in that instance the focus was placed upon a mountainous region, the same discussion and rules should be applied to an attack upon a lawful target located in a desert, at sea, underwater, in the air, or in space. Attacks in these regions with the use of an AWS, is no different to a commander lawfully deploying any one of a number of weapons that are incapable of conducting their own proportionality assessments because the there

[643] To be clear, where no civilian population is located proximate to a lawful target, there can be no incidental or collateral effects of an attack upon it.

are no civilians at or proximate to the attack 'zone'. Existing weapons which are used in this manner are generally non-autonomous munitions such as a Hellfire or a MOAB. However, more advance AWS such as the Brimstone and the LRASM are capable of operating similarly. There is no doubt, that when weapons development allows for deployments of increasingly advanced autonomous platforms, the very same principle would apply.

3.3.5 Attack 2.

This section considers an attack upon what is presumed to be a lawful target, though it is located in a densely populated location. And it is circumstances such as these which opponents of AWS generally refer to when arguing that proportionality should be used as a grounds for prohibiting AWS. Once again, this analysis considers Scenario III, which, has identified a number of potential military targets that are located within the civilian population. Target (i) is a military compound which houses, amongst other things, approximately 100 ground platforms such as tanks and mobile defensive missile systems. Target (ii) is a munitions factory. These are both clearly defined military instillations, though they are located in close proximity to the civilian population. Target (iii) is the dual use airfield. These three targets are considered below with specific regard given to the *Template*, and to IHL proportionality.

All three of the targets identified pose a challenge to a commander because they all have the potential to cause collateral damage. As noted, this is not unlawful *per se*. However, proportionality it perhaps the most controversial of all IHL obligations because is application is particularly challenging to convey.[644] Therefore, while proportionally is often used as grounds for supporting the *Prohibition*, the introduction of increasingly advanced AWS could actually provide the international community with an opportunity to resolve a long established IHL imbalance.

As previously noted, the principle of proportionality is an implicit acknowledgment that civilians are inevitably killed in war. And, as is discussed by the author elsewhere, this is actually an increasing rather than a decreasing phenomenon, given that contemporary armed conflict tend to be conducted in particular urbanised environs.[645]

[644] Corn *et al*, *ibid.,* n.632, at 152.
[645] Noting that at the Battle of Solferino, the last great European battle in which two monarchs led the lines, only one civilian casualty was recorded. See e.g., William H. Boothby, 'Direct Participation in

Proportionality assessments clearly, therefore, play a vital role in helping IHL to achieve its task of reducing the impact of armed conflict. In the preceding discussion, two methods of applying proportionality to AWS were identified, either by the decision-maker responsible for authorizing the deployment of AWS, or by the AWS itself. Both of these are considered below.

One might reasonably argue that a commander could authorise an attack with an Aws upon targets (i) and (ii) having conducted his or her own proportionality assessment and deemed that any anticipated collateral damage was proportionate in the circumstances. Here, for example, the commander might employ a L2AWS [O]/[L] which was capable of loitering for a short period. This system might be preferable to a non-autonomous munition for a number of reasons, not least due to the commander's duty and willingness to protect their own combatants (force protection),[646] and also to prevent *Orientale* hacking into the communication channel of a remotely operated UAV.

Depending upon the prevailing circumstances, the L2AWS may decide to pause for a moment, and to wait for the opportunity to cause the greatest damage, having identified a convoy of an additional 40 platforms heading towards the compound. Situations such as these are typically overlooked by the ongoing debate, which tends to focus instead upon AWS that operate at a greater temporal distance from the commander.[647] The

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Hostilities – A Discussion of the ICRC Interpretive Guidance' (2010) 1 International Humanitarian Legal Studies 143, 145. Here the scholar cites in turn, Pierre Krähenbühl, 'Civilians Bear the Brunt of the Changing Nature of Hostilities' (23 June 2009) para. 1 https://www.icrc.org/en/doc/resources/documents/interview/research-interview-240609.htm accessed 12 July 2021. Also see, 'The Battle You've (Probably) Never Heard of: June 24, 1859'(24 June 2018), para. 5 https://intercrossblog.icrc.org/blog/the-battle-youve-probably-never-heard-of-june-24-1869 accessed 11 June 2021. In contrast, as noted by, François Bugnion, 'From Solferino to the Birth of Contemporary International Humanitarian Law' (ICRC, 2009), 3 https://www.icrc.org/en/doc/assets/files/other/solferino-bugnion-icrc.pdf accessed 11 July 2021, 'in ten hours of fierce fighting, more than 6,000 soldiers were killed and more than 30,000 wounded.

[646] As previously noted, the protection of the civilian population is the paramount objective of IHL. However, if on the one hand a military decision maker must consider the civilian impact of choosing to launch, or not to launch a particular attack, the other hand must reflect upon a second concept – force protection - the wellbeing of their own combatants. Though it is not entirely clear, some have considered whether there should be a hierarchy, or legal obligation placed upon the targeting party to ensures that they consider the lives of the civilian population, over and above that of their own combatants. However, see e.g., See e.g., Jens David Ohlin, 'Is Jus in Bello in Crisis?' (2013) 11 Journal of International Criminal Justice 27, 28-29. Here, the author argues that it would seem a little perverse if international law did prevent an attacking force from lowering the risk to its own personnel if doing so not did not increase the risk of collateral damage to civilians.

[647] This point is implied by Schmitt and Thurnher, *ibid*, n.38, 280. Her ethe authors argue '[h]uman operators, not machines or software, will...be making the subjective determinations required under the law of armed conflict, such as those involved in proportionality or precautions in attack calculations.

hunter-killer drone, considered in the previous chapter, being a perfect example. Nevertheless, where an AWS is incapable of applying an independent proportionality assessment, it may still, in certain circumstances be possible to deploy them lawfully.

For the reasons previously identified, L4AWS should not be utilised in this manner. And an operational swarm would also need to be deployed in accordance with the rules that were applicable to the L3AWS identified in attack 1. An example of a L2Aws has already been provided, and again these would need to be restricted to tactical deployments only to ensure MHC is kept. Finally, a L1AWS would operate similarly to a L2AWS, with one obvious example of a current L1AWS [O]/[L] being deployed upon battlefield being the Harpy drone (considered above).

There is likely to be a temporal point in the future at which the commander's proportionality assessment must be seen as obsolete. Though, it would be unwise to attempt to identify a fixed moment, for example 30 minutes in the future. This is because each proportionality assessment is highly contextual, and dependent on a large verity of factors. For example, as previously noted, the time it takes for existing weapons to apply their force after launch can vary significantly. The Harpy drone can loiter for up to six hours, and it can take upwards of 30 minutes for an ICBM to complete its three phases of flight. In contrast however, although still considered a munition, a hand-grenade will typically detonate in just a few seconds.

As a result, where AWS are deployed according to a commander's proportionality assessment, the commander must have a specific situational awareness with regard to the operating procedure of each AWS at his or her disposal. As noted by RULE 3 the reality is that this can only be achieved through adequate training. However, the following should be considered,

Although the subjective decisions may sometimes have to be made earlier in the targeting cycle than has traditionally been the case, this neither precludes the lawfulness of the decisions, nor represents an impediment to the lawful deployment of the systems.'

RULE 29
Where there is a possibility that an AWS could continue to operate free from human coercion after the expiration of a commanders assessment, the AWS must be capable of conducting its own assessment. Where it is incapable of doing so, it must at the very least be programmed to refrain from taking further action. This may be either aborting the mission entirely, or continuing the mission once the need for a proportionality assessment has passed.

According to their opponents, this is one of the gravest areas of concern when it comes to AWS deployments.[648] And, in terms of attacking targets (i), (ii), and (iii), there is no existing weapon, autonomous or otherwise that can adhere to the rule above. According to HRW, is very unlikely that a machine could ever do so because they would be unable to quantify the concepts of civilian harms and military advantage, and even less likely to be able qualitatively balance them.[649] In addition, they argue that the programmers of AWS could never anticipate all of the circumstances in which a proportionality assessment would be necessary, and thus that a commander could never truly know how an AWS is going to behave.[650] According to HRW, only humans can make proportionality assessments - these are made according to the concept of the reasonable military commander. As a result, this concept is considered in greater detail below.

3.3.6 The Reasonable Military Commander.

The reasonable military commander is a standard to which military decision makers are judged. Consequently, while a military decision-maker must 'do everything feasible to verify that the objects are neither civilians nor civilian objects',[651] they are not, in the fog of war, expected to go to extraordinary lengths to gather information. Instead, they must 'take all *feasible* precautions in the choice of means and methods of attack'.[652]

[648] HRW 2016, *ibid*, n.312, 5-8.
[649] *Ibid,* 6.
[650] *Ibid,* 7.
[651] Art. 57(2)(a)(i) API, *ibid*, n.43.
[652] Art. 57(2)(a)(ii) API, *ibid*, n.43.

As the author has discussed elsewhere, these can be referred to as feasible verification, and feasible precautions respectively.[653] The point is however, in terms of weapons selection, they must choose carefully. Nevertheless, while there is a broad range of acceptable behaviours, it is not an exact science.[654] And, if a retrospective appraisal of a commanders actions upon the battlefield is necessary, it is compared to behaviour of the reasonable military commander. This standard is deduced from the case of *Galic*, where the ICTY stated that,

> '[i]n determining whether an attack was proportionate it is necessary to examine whether a reasonable well-informed person in the circumstances of the actual perpetrator, making a reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack.'[655]

An attacker must, therefore, make a subjective analysis of the facts at their disposal. They cannot turn a blind-eye, they must act in good faith.[656]

3.3.7 AWS and The Reasonable Military Commander.

If AWS are going to be capable of making individual proportionality assessments, they must either meet or surpass the standard of the reasonable military commander. This section therefore examines (i) whether only the reasonable military commander can make subjective battlefield appraisals, and (ii) whether an AWS could ever be programmed to be *reasonable*? Opponents believe they are not.[657] For example, some claim to have demonstrated that the proportionality assessment is a solely human characteristic that is highly dependent upon moral and ethical evaluations.[658]

Moreover, they add, due to highly contextual nature of armed conflict, *reasonableness*

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[653] Generally, Grimal and Pollard (2021), *ibid,* n.4.
[654] Dinstein, *ibid,* n. 244, para. 424. Dinstein in turn cites, W.J. Fenrick, 'The Rule of Proportionality and Protocol I in Conventional Warfare' 98 [1982] Mil. LR 91, 102.
[655] *Galic Case*, *ibid,* n. 537, para 58. This definition puts beyond doubt that the proportionality assessment is necessary in each and every attack, not only those directly authorised by a commanding officer. Nevertheless, it must also be noted that the concept of command responsibility, also holds the commanding officer in-directly responsible for the targeting decisions of his subordinates.
[656] Dinstein, *ibid,* n. 244, para. 426.
[657] See e.g., HRW (2016), *ibid*, n.312, 7.
[658] *Ibid.* Noting that greater discussion regarding AWS and ethics is to be found in Chapter Five.

is a subjective assessment that is incapable of being objectively defined.[659] Indeed, Dinstein notes that '[t]here is no objective possibility of 'quantifying the factors of the equation' and that the process of assessment 'necessarily contains a large subjective element"'.[660] There are, however, a number of difficulties with this presumption, which Dinstein himself notes. In the first instance, [m]ilitary advantage and civilian casualties/damage are incomparable in a quantifiable manner.

HRW 2016 offers that '[e]ven if the elements of military advantage and expected civilian harm could be adequately quantified by a fully autonomous weapon, it would be unlikely to be able qualitatively to balance them.'[661] However, while it may be possible for both humans, and AWS, to identify the likely civilian casualties and/ or damage, how can one measure military advantage?[662] And, if it is not possible to place a tangible mark upon a scale, how can we then go on to balance one projection against another, when the two share no common denominator?[663]

HRW fail to sufficiently acknowledge such difficulties. Instead they appear content to portray the *reasonable military commander* as an individual who is consistently capable of making the necessary subjective assessment, whilst at the same time noting that 'the sort of judgment required in deciding how to weigh civilian harm and military advantage in unanticipated situations would be difficult to replicate in machines'.[664] Nevertheless, while it is true that there are difficulties in conceptualising the military advantage,[665] is also true that '[c]omparing military advantage anticipated against expected civilian losses is a process riddled with inevitably subjective value judgments', which in this instance, is not necessarily a good thing.[666]

HRW discuss subjectivity as though it is a concept that needs to be protected at all costs. However, should it be considered just, that a subjective application of IHL proportionality could lead to death of one or more civilians in one instance, whilst an

[659] *Ibid.*
[660] Dinstein, *ibid,* n. 244, para. 424.
[661] HRW (2016), *ibid*, n.312, 6.
[662] Dinstein, *ibid,* n. 244, para .425.
[663] *Ibid,* para. 425. Also see generally, Grimal and Pollard (2021) *ibid,* n.4.
[664] HRW (2016), *ibid*, n.312, 8.
[665] Sassoli, *ibid*, n.39, 331.
[666] Sassoli, *ibid*, n.39, 331.

appraisal by an alternative reasonable commander might spare them? [667] Surely this is not the most appropriate way of applying IHL, and AWS could help to address this. Although it is likely to be a difficult task, the increase in objectivity that would be required for the programming fully proportionality compliant AWS will be nothing but beneficial. This is, not least, because, although it may be a complex task, programming proportionality 'may have the advantage of obliging States to agree on how exactly proportionality must be calculated, and also on which parameters influence this calculation.'[668]

A second issue Dinstein notes is that presently '[t]here is little prospect of agreement between the opposing Belligerent Parties as to the values of military advantage and collateral damage.' [669] AWS, however, could be pre-programmed with a set of indicators, and/ or criteria that had been previously identified by a number of military, legal, and humanitarian experts.[670] Contrary to the predominately westernised *just war theory*, these experts must be representative of different States and cultures. Cultures, for example, which have a very different perspective on the development and use of robotics in society generally.[671]

As a consequence, such a discussion could help to balance some of the opposing battlefield perspectives. And, if it were indeed possible to identify, agree, and programme such *objective* criteria, an AWS would be in a position to evaluate the two branches of the principle of proportionality more accurately - and faster than its human counterpart. In other words, an AWS could consider the *reasonableness* of an attack, while remaining uninfluenced by biases such as force protection, cultural prejudice.[672]

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[667] Sassoli, *ibid*, n.39, 335. Here Sassoli offers, 'why should a certain civilian be better protected under the law from incidental effects arising from an attack by one soldier than by another soldier? Why should the soldier's youth, education, values, and religion or ethics matter at all? Should not the only consideration be the military advantage to be gained and the incidental effect upon civilians?'
[668] *Ibid,* 331.
[669] Dinstein, *ibid,* n.244, para. 425(b).
[670] Sassoli, *ibid,* n.39, 331.
[671] For example, while many western cultures appear inherently suspicious of the use of robots, in the home, and in other settings such as the healthcare environment, most Japanese citizens welcome their introduction. See e.g., Joi Ito, 'Why Westerners Fear Robots and The Japanese Do Not' (*Wired*, 30 July 2018) < https://www.wired.com/story/ideas-joi-ito-robot-overlords/ > accessed 28 September 2018.
[672] Dinstein, *ibid,* n.244, para. 425(b).

The complexities of warfare also mean that the 'matter of pre-attack expectation and anticipation…is necessarily embedded in probabilities.[673] Consequently, the actual military commander must subjectively weigh up the two branches of proportionality in order to identify whether he believes the military advantage outweighs the likely collateral damage. Nevertheless, is there no guidance as to whether he should proceed with the attack if there is a less than 100 percent probability of gaining a military advantage.

Therefore, the question is, what if the chance of success appears to be only 60, or even only 40 percent? Once again, the law offers no substantial guidance. As a result, the actual military commander must decide upon whether or not to attack, based upon the knowledge available at the time. In addition to considering both relevant information and concrete intelligence, a commander's decision is also likely to be based upon intuition, or instinct – though it may only become clear if an action requires retrospective analysis as to whether their reasons for launching the attack were speculative, rather than certain.

Further to identifying the benefits of introducing a greater level objectivism into proportionality assessments, it is important to highlight that the balancing of probabilities is what that algorithms do best. Indeed, since the 1960's, when Ray Solomoff identified that 'the universality of Universal Turing Machines (UTMs) could be used for universal Bayesian prediction and artificial intelligence (machine learning)',[674] the development of probability algorithms has continued in haste. Probability algorithms are currently used in a variety of contexts, from predicting human behaviour, to stock market forecasting, to the development of driverless vehicles.

Primarily, this is because they are able to function more accurately, and infinitely faster than humankind. With that in mind, it may be possible to eventually develop and deploy IHL compliant AWS which will operate according to a set of predetermined, objective criteria. When this happens, they will be much more capable of identifying and

[673] *Ibid*, para. 425(c).
[674] David L Dowe (ed), *Algorithmic Probability and Friends. Bayesian Prediction and Artificial Intelligence: Papers from the Ray Solomonoff 85th Memorial Conference*, (Springer, 2011). Also see generally, Ray J. Solomonoff, 'The Discovery of Algorithmic Probability' [1997] 55 Journal of Computer and System Sciences, 73.

calculating the relevant balance of probabilities with more accuracy than it human counterparts.

The final issue is that it is uncertain whether a commander should include secondary, and/ or tertiary effects in proportionality assessments.[675] Though this is not an entirely settled debate, Dinstein suggests that indirect consequences should *not* become part of the targeteer's analysis. A narrow reading of Article 57 API does appear to support this. And such a reading is not necessary any more problematic for AWS deployments which can be linked, for example, to a commanders proportionality assessment.

This discussion is not directly linked to the programming of the two concepts contained within Article 57. However, AWS are likely to offer a greater real-time overall impression of the battlefield than has ever been possible before. A future commander might, therefore be more capable than ever of considering the combined consequences of, either a limited number of individual attacks, or the status of the overall combined battleplan. And with that in mind AWS *must* share information, and, for example, constantly receive real-time, battlefield updates.[676]

There are many reasons to support this viewpoint, not least because a commander with access to this information will be the most *informed* commander ever. However, as has been previously noted, AWS must also be limited in the way in which they are permitted to *react* to this shared information. The point here is, if AWS are permitted to operate in either a strategic or operational manner, they become much more unpredictable, and thus, a more dangerous concept.

As noted in Part 2, it is simply remiss merely to highlight the difficulties that an AWS might have with regards to assessing whether or not an enemy was directly participating in hostilities, without also pointing out the various obstacles and challenges faced by the human combatant. Opponents of AWS believe that the concept of the *reasonable military commander* is key to determining the lawfulness (or not) of AWS. They argue that this necessarily subjective notion is responsible for balancing the two concepts that are central to each proportionality assessment – collateral damage, and military advantage.

[675] Dinstein, *ibid,* n.244, para. 425(d).
[676] Sassoli, *ibid,* n.39, 328.

Nevertheless, while it would be an arduous task to write and programming objective code reflecting proportionality, it is not necessarily impossible. And, doing so will provide the international community an opportunity to identify and agree upon acceptable values for proportionality assessments – something which is currently lacking. Command operating systems have the potential to provide future human commanders with a more detailed and accurate real-time illustration of the battlefield than ever before. However, to ensure compliance with the concept of MHC, autonomous systems should be limited to striking pre-identified and authorised targets [L3AWS [O]/[L]. For the same reasons considered above, this is not the case for L3AWS [O]/[N], where the attack does cause physical or lasting civilian harms.

The use of L2AWS and L1AWS is also as before. Noting, that these examples are where a fully proportionality compliant AWS may lead to a better application of IHL. Currently, when a non-autonomous missile is deployed, a commander is unable to recall it. However, an autonomous ICBM might be programmed to carry out a continuous proportionality assessment,[677] and in doing so, decide not to commit to destroying a target that was pre-identified by a human decision-maker. It may reach this decision for a number of reasons, including where the situation 'on the ground' was actually very different to that which was envisaged by the individual authorizing the weapons deployment.[678] Moreover, autonomous platforms can provide a method of better applying IHL in light of the increase in force protection, because a commander may feel more at ease authorising a L2AWS to fly at a low altitude to ensure greater targeting accuracy, than they might with a manned aircraft.[679]

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[677] See generally, Grimal and Pollard (2021), *ibid,* n.4.
[678] *Ibid.*
[679] During the Kosovo war, NATO commander chose to employ a policy of high-altitude bombings (air strikes took place from March 24, 1999 – June 10, 1999) beyond the range of land-to-air defence systems (pilots were ordered to fly above 15,000ft). NATO employed this strategy in order to protect the lives of its own combatants. However, many have been critical that because the bombs were launched from a higher altitude, a greater number of civilians died as a result. The bombings could therefore be considered as indiscriminate, and therefore incompatible with IHL. Although highly controversial, no successful legal action has been brought against any NATO member State. For a useful discussion see e.g., John Yoo, 'Embracing the Machines: Rationalist War and New Weapons Technologies' [2017] 105 Cal. L. Rev. 443, 469. Here the author argues '[a]ir war suggests that we should welcome robotics with open arms. Robots offer greater precision in combat, which should reduce destruction to both military soldiers and civilians alike. They should lead to a de-escalation of the intensity of warfare prompted by the technological developments of the twentieth century. We should understand the traditional rules of war to demand that armies choose the least destructive means to achieve a military objective, just as those who argue in favor of precision-guided munitions do today. If this is so, robots will allow nations at war to comply with the grand humanitarian goals of the laws of war far better than a world where drones are banned...'

3.3.8 Part 3: In Sum.

This section has demonstrated that there are a number of circumstances in which a commander is, and will continue to be, awfully permitted deploy AWS. This is the case, regardless of whether or not an AWS is capable of conducting its own proportionality assessments. Moreover, this applies where civilian harms are likely to arise from an attack. This is possible, in the first instance, providing that a commander is able to demonstrate that their own proportionality assessment is sufficient in the circumstances. However, because the circumstances in which a commander can deploy an AWS according to their own proportionality assessment are highly contextual, this means that,

RULE 30
A commander must consider proportionality on a case-by-case basis.

In addition, there is a clear need to introduce a fail-safe, that is the

RULE 31
Where a commander authorises the deployment of an AWS that is unexpectedly placed in a situation where a proportionality assessment is required, but where the AWS does not have the capacity to carry out such an assessment, (or where there is no additional guidance from a third-party) the AWS must refrain from taking further action. It may do so either by aborting the mission entirely, or by continuing the mission once the need for a proportionality assessment has passed.

Finally, this section has also demonstrated that although their use would be particularly controversial, and even unwelcomed in certain instances, AWS could potentially be programmed to conduct their own proportionality assessment. In order for that to happen the international community will need to attempt to answer some uncomfortable questions regarding the value of certain targets, and their corresponding civilian harms. This will go some way to addressing the current shortfalls contained with the obligation as it currently stands.

PART 4. Military Necessity and the Combatants Duty to Take Precautions in Attack.

Distinction and proportionality are undoubtably the single most significant IHL principles regarding AWS deployments. Nevertheless, the previous analyses have demonstrated that these principles cannot be used show that AWS are inherently unlawful under the jus in bello. This final part of Chapter Three, therefore, examines two additional IHL concepts that are particularly pertinent in the enquiry into the lawfulness of AWS deployments. The two concepts are, military necessity and, the combatant's duty to take precautions in attack.

As the following analysis demonstrates, as well as being intrinsically linked to one and other, these two concepts are further intertwined with distinction and proportionality. As a consequence, many factors which are pertinent to the Part 4 discussion have already been considered previously. To avoid repetition, some relevant discussion is not repeated here - although there is inevitably some crossover. They are considered here as independent concepts, primarily because that is how opponents of AWS have generally referred to them

3.4.2 Military Necessity.

This section continues the analysis of AWS under IHL by considering an additional concept of military necessity. This is a concept that is also referred to simply as 'necessity',[680] and it is often referred to as an independent IHL principle.[681] Proponents of this denotation believe that it should be viewed on an equal footing with the principles of distinction and proportionality.[682] And, to some extent necessity *has* already been considered above in terms of proportionality – military 'advantage' being one of the two elements which Art 57(2)(a)(ii)(b) seeks to balance. Indeed, as this

[680] See generally e.g., Lawrence Hill-Cawthorne, 'The Role of Necessity in International Humanitarian and Human Rights Law' (2014) 47(2) Israel Law Review, 225. Once again, IHL necessity must be distinguished from its *jus ad bellum* counterpart.

[681] See e.g., 'How Does Law Protect in War: Military Necessity' (ICRC) https://casebook.icrc.org/glossary/military-necessity accessed 11 July 2021. For a useful discussion regarding military necessity see, Dinstein, *ibid,* n.244, paras. 20-32.

[682] This is, for example, how HRW introduce it. See, HRW (2012), *ibid,* n.15, 26.

chapter has routinely noted, 'the task of the law of armed conflict is to balance the demands of military necessity against humanitarian concerns'.[683]

Necessity simply cannot be considered in isolation. Humanitarian considerations, for example, prevent the parties to the conflict from choosing any method and means of warfare that they desire in order to gain a military advantage.[684] As is considered in the following section, where possible, these provisions ensure that a weapon must be chosen that minimises civilian harms. Humanitarian considerations also prohibit a party from causing unnecessary suffering to combatants. This is a concept that is reflected in the treaties,[685] in the decisions of the ICJ, [686] and also regarded as CIL.[687]

In short, a military decision-maker must regularly evaluate, and determine which one of these two independent concepts - in the circumstances ruling at the time - appears to outweigh the other. [688] When considering necessity as one half of a balancing act, a belligerent Party cannot justifiably wield a violent force, only insofar as it leads to them gaining a military advantage.[689] Simply put, necessity requires that a belligerent must only use force in order to *leverage a military advantage*.[690]

3.4.3 AWS and Military Necessity.

The remainder of this section draws attention to, and discusses the inadequacies of, the submission that the independent *principle of necessity* should prevent the development, production, and use of AWS.[691] It does so, in a number of individual, yet interrelated ways. First, the analysis demonstrates the *concept* of military necessity is so inextricably intertwined the legal principles of distinction and proportionality, it is very

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[683] Beer, *ibid,* n.638, 802.
[684] See, art. 35(1) API, i*bid*, n.43 states: '[i]n any armed conflict, the right of the parties to the conflict to choose methods or means of warfare in not unlimited', Also see, *Nuclear Weapons Advisory Opinion*, *ibid*, n.73, para 78.
[685] Art. 35(2) API, *ibid*, n.43. This states, '[i]t is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering'. In addition, see, Art. 35(3) API, *ibid*, n,.43. Here it provides, '[i]t is prohibited to employ methods and means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment'. Also see e.g., the (CCW), *ibid,* n.2, Protocol II CCW, *ibid,* n.138, Amended Protocol II CCW, *ibid,* n.138, and, the Ottawa Convention, *ibid*, n.138.
[686] See e.g., *Nuclear Weapons Advisory Opinion*, *ibid,* n.73, para. 78.
[687] ICRC Customary Rule 70, *ibid,* n.518.
[688] Dinstein, *ibid,* n.244, para. 21.
[689] *Ibid*, para 22. Here the author states: 'the determination of what action or inaction is permissible in wartime does not rest on the demands of military necessity alone'.
[690] Dinstein, *ibid*, n.244, para. 21.
[691] See e.g., HRW (2012) *ibid,* n.15, 34-35.

difficult to identify how autonomous targeting decisions made in furtherance of those two fundamental humanitarian objectives should be seen as misplaced.

In addition, and similar to the proportionality analysis, this section identifies the concept does not require the subjective human analysis that critics of AWS insist is necessary.[692] Finally, this section acknowledges and supports the proposal that the introduction of AWS, offers States an ideal opportunity to re-evaluate a concept that aims to reduce the hazards of war in the positive way, but is largely underutilised in armed conflict.[693]

3.4.4 Military Necessity: A Case of Mistaken Identity.

As noted, many define necessity as the third independent IHL principle. However, an alternative interpretation, and one which has been provided by the ICJ, is that military necessity is one of the two *driving forces* of IHL.[694] Given the ICJ's function,[695] the present author prefers the definition which they have supported. And, in contrast to HRW and the ICRC, it holds that necessity should be seen as a foundational concept which underpins the whole of IHL.[696]

Prima facie, it appears to make little difference, because in either case necessity still runs through the very heart of each and every targeting decision.[697] However, the distinction is vitally important because the latter interpretation recognises that necessity does not provide an additional legal obligation by which AWS should be assessed. Instead, it is an enabler, which allows for IHL to function correctly. This viewpoint is compounded by the fact that necessity is not specifically referenced or codified within

[692] *Ibid*. One of the grounds on which HRW seek to prohibit the development, production and use of AWS, is that adherence to military necessity 'requires a subjective analysis of a situation…(and therefore)… [f]ully autonomous weapons are unlikely to be any better at establishing military necessity than they are proportionality.
[693] Generally, Beer, *ibid,* n.683.
[694] Dinstein, *ibid,* n.244, para. 20.
[695] See, art. 38(1) Statute of the ICJ, *ibid*, n.57. This states, '…whose function is to decide in accordance with international law such disputes as are submitted to it'.
[696] Also see, Schmitt, *ibid*, n.42, 22, Dinstein, *ibid,* n.244, para. 21. Both supporting the 'driving force' variant, as opposed to the independent legal principle.
[697] The second driving force being humanitarian considerations. See, Dinstein, *ibid,* n.244, para. 22.

the Treaties.[698] And, it is primarily for that reason that while the ICRC *have* identified military necessity as CIL,[699] that is not an altogether uncontroversial assertion.

As the rules, thus far, have identified, an AWS that fails to distinguish civilian from combatant is undeniably unlawful. In addition, and AWS that operated without a clear military advantage, or that caused excessive damage to the civilian population, would fail to meet the proportionality obligation.[700] However, the previous investigations have demonstrated that it is possible to deploy AWS where they cannot adhere to distinction and proportionality requirements. And, in the circumstances where such weapons can still be lawfully deployed, military necessity cannot provide grounds for preventing their use because are it has 'no independent valence when assessing the legality' of AWS.[701]

While necessity may not provide a positive legal obligation, it nevertheless remains an important element of military operations. As a result, if Aws are to have regard for it, necessity may need to be *objectively* programmable. Similar to the examination regarding proportionality, HRW claim that due to subjective analysis being a prerequisite, '[f]ully autonomous weapons are unlikely to be any better at establishing military necessity than they are proportionality'.[702]

For a number of reasons, some of which have been previously identified, that premise is lacking. The first reason, as evidenced in the previous sections, it that there are a number of circumstances where AWS's can be deployed regardless proportionality.[703] This has also been previously demonstrated for distinction. The second, albeit the primary, retort to HRW's submission, is analogous to the nature of the discussion surrounding proportionality, and, in particular the *reasonable military commander* already considered.

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[698] As noted by, HRW (2012), *ibid,* n.15, 25 regardless of their argument.
[699] See e.g., *ICRC Customary Rule* 43, *ibid*, n.518. In consideration of the environment identifying '[t]he general principles on the conduct of hostilities apply to the natural environment: A. No part of the natural environment may be attacked unless it is a military objective. B. Destruction of any part of the natural environment is prohibited, unless required by imperative military necessity. C. Launching an attack against a military objective that may be expected to cause incidental damage to the environment that would be excessive in relation to the concrete and direct military advantage anticipated is prohibited.'
[700] Schmitt, *ibid,* n.42, 22.
[701] *Ibid.*
[702] HRW (2012), *ibid*, n.15, 35.
[703] This is even acknowledged by opponents of AWS. See e.g., Sparrow, *ibid,* n.579, 103.

The reality is, that the current balancing act is subjective, merely because it has to be. But that does not mean that it should remain so. If the international community reached an agreement to place a value upon each element of the equation, and the technology presented itself, identifying the correct equilibrium could become a straightforward objective assessment, that was identifiable both in advance of, and following an attack.[704]

Currently, in the same way that 'there is little prospect of agreement between the opposing belligerents as to the rival values of military advantage and collateral damage',[705] there is little chance of complete agreement as to the precise obligation to consider the weight of the military necessity. As a result of this imbalance, one commentator proposes that the concept falls far short of shielding combatants and civilians alike.[706]

Instead, '[c]urrently any shot in the battlefield aimed against a combatant is generally lawful and could be justified as necessary'. In much the same way, another commentator offers, AWS 'would not be unlawful *per se* because it is clear that autonomous weapon systems may be used in situations in which they are valuable militarily—that is, militarily necessary'.[707]With that in mind, as previously noted the introduction of AWS may provide nations, and indeed the GGE, with an opportunity to place more emphasis upon achieving a suitable balance.

A set of objective criteria can help military decision-makers to apply the principle of proportionality more uniformly and more accurately. They can also contribute to ensuring a better administration of the balancing of military necessity and humanitarian considerations. In an attempt to counter the existing bias weighting, a small number of

[704] This would clearly help support any tribunal or court assigned the task of assessing an act retrospectively.
[705] See e.g., Dinstein, *ibid*, n.244, para. 425(b), and, Beer, *ibid*, n.638, 827 who highlights the ICTY committee established to review NATO's bombing campaign in Kosovo (also see, *ibid,* n.679) offered '[i]t is unlikely that a human rights lawyer and an experienced combat commander would assign the same military values to military advantage and to injury to combatants…' See, Final Report, *ibid*, n.290, para. 50.
[706] Beer, *ibid,* n,638, 828.
[707] Schmitt, *ibid*, n.42, 22.

militaries have limited, internal, self-imposed doctrines that oblige combatants to accept great risk in order to minimalize harm to non-combatants.[708]

The introduction of AWS will ensure these types of humanitarian policies are concreted into the heart of IHL, because AWS will not be affected by the uniquely human concept of self-preservation. Beer forwards a hypothesis which seeks for all States to adopt professional military constraints. He does so because he believes it is becoming increasing more justified due to the changing character of war. Insofar as the introduction of AWS is concerned, this view must be supported. And the introduction of AWS can also provide States with an opportunity to consider the 'cultural, social, technological and military changes that are now taking place'.[709] Thus, the framework forwarded by this thesis can help to redress the imbalance of the military necessity assessment.

In seeking the middle ground between military necessity and humanitarian considerations, IHL 'amounts to a checks and balances system aimed at minimalising human suffering without undermining the effectiveness of military operations'.[710] While it is indeed difficult to overstate the significance that military necessity plays, it is also a complex task to establish the extent to which military commanders consider themselves restricted by it. Where a military commander has launched an attack according to the 'principles of distinction, proportionality and the forbiddance of unnecessary suffering',[711] they are generally considered to be operating within the confines of the law - and importantly, according, to the concept of military necessity. Thus, necessity cannot be used in isolation to support the development and use of AWS.

3.4.5 The Combatants Duty to Take Precautions in Attack.

This final, albeit brief analysis, considers the introduction of increasingly advanced AWS in regard of two concepts which have been referred to previously - feasible verification, and feasible precautions. As is also previously noted, the present author

[708] See, Beer, *ibid*, n.638, 807. Here the author notes, for example, U.S. Marines counter insurgency doctrine (COIN), requires that commanders adopt appropriate and measured levels of force and apply that force precisely so that it accomplishes the mission without causing unnecessary loss of life or suffering. Also see, The US Army – Marine Corps Counterinsurgency Field Manual (University of Chicago Press, 2007) 37-39 and 42-52, paras. 1-142.
[709] Beer, *ibid*, n.638, 824.
[710] Dinstein, *ibid,* n.244, para. 25.
[711] Beer, *ibid,* n.638, 803.

has considered these concepts in detail elsewhere,[712] where the author also notes that these two concepts can be distilled from Article 57(2)(a)(i), and 5Article 7(2)(a)(ii) API respectively. These provisions identify, for example that, 'those who plan or decide upon an attack shall'[713]

> '(i) do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives within the meaning of paragraph 2 of Article 52 and that it is not prohibited by the provisions of this Protocol to attack them…[and]…'[714]
>
> '…(ii) take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects'.[715]

API does not define of the term feasible. And, though much ink has already been split trying to identify the best interpretation,[716] the present author does not wish to further that decision here. However, in terms of the obligation to feasibly verify military objectives, and to take feasible precautions in the means and method of attack, feasible is generally understood to mean, 'those precautions which are practicable or practically possible taking into account all circumstances ruling at the time, including humanitarian and military considerations'.[717]

Article 35(1) API is also relevant to the duty to take precautions.[718] This states, for example, that 'the right of the Parties to choose methods or means or warfare is not unlimited'.[719] There is no requirement for the targeteer to use the least force necessary when attacking a legitimate military target.[720] But, feasible verification, and feasible

[712] See generally, Grimal and Pollard (2021), *ibid,* n.4.
[713] Art.57(2)(a) API, *ibid,* n.43.
[714] Art. 57(2)(a)(i) API, *ibid,* n.43.
[715] Art. 57(2)(a)(ii) API, *ibid,* n.43.
[716] This forms a central part of the discussion in, Grimal and Pollard (2021), *ibid,* n.4.
[717] See, art. 3(10) Protocol II CCW, *ibid*, n.2.
[718] Grimal and Pollard, *ibid,* n.4, 681-682
[719] *See*, Regulation 22 annexed to the Hague (1907), *ibid*, n.138 stating '[t]he right of belligerents to adopt means of injuring the enemy is not unlimited'.
[720] This is discussed in greater detail in the following chapter.

precautions ensure that those who are tasked with conducting distinction and proportionality assessments, must do all that is practicable in the circumstances to avoid, or in any case minimize, civilian harms.

When the preceding discussion is taken into account, it is not hard to see why the duty to take precautions is so inextricably intertwined with the IHL principles of distinction and proportionality. Indeed, the duty to take precautions in attack includes the requirement for a decision-maker to make assessments where necessary, and to refrain from launching any attack which may be expected to cause excessive collateral damage.[721] This clearly refers to the proportionality assessment, which, having been previously considered, does not need addressing again here.

3.4.6 AWS and the Combatants Duty to Take Precautions in Attack.

As has already been addressed in the discussion regarding proportionality, the duty to precautions in attack does potentially impact upon the introduction of AWS. The investigation in this section however, does not need to be overly extended. Simply put, some opponents of AWS believe that where an AWS is deployed, the duty to take *sufficient* precautions cannot be discharged.[722] They argue, for example, that where an AWS is deployed in circumstances where the target has not been previously identified, it is impossible for the commander to know whether all feasible precautions have been taken to determine whether the target is a legitimate one.

While in certain instances this may be true, the primary purpose behind introducing the rules throughout this chapter, is that where AWS deployed, and in particular where lethal AWS are deployed, target identification is of paramount importance. Indeed, thesis Rule 26, for example, stipulates that where a target cannot be clearly identified the AWS must abort, or at the very least pause its mission. As a result, while there is some truth in the protestation that feasible verification should prevent the use of AWS, the reality is that it should only prevent certain uses of AWS.

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[721] Art. 57(2)(a)(iii) API, *ibid,* n.43.

[722] See e.g., ICRC, 'Artificial intelligence and machine learning in armed conflict: A human-centred approach' (ICRC, 2019), 7-8 https://www.icrc.org/en/document/artificial-intelligence-and-machine-learning-armed-conflict-human-centred-approach accessed 11 July 2021. In contrast see generally, Eric Talbot Jensen, 'Autonomy and Precautions in the Law of Armed Conflict' (2020) 96 Int'l L. Stud. Ser. US Naval War Col. 577.

Feasible precautions should not, therefore, be used as a method for demonstrating that AWS are inherently unlawful. Nevertheless, the obligation will continue to play an important role in determining the lawfulness of the use of AWS. This is because, as the author has noted elsewhere,[723] should AWS reach their potential, and one day be capable of adhering to IHL principles more precisely than human combatants, commander may be obliged to use them.[724]

The point here is,

RULE 32
When taking feasible precautions, a commander will need to take account of whether greater civilian harms would occur as a result of not deploying an AWS. Where this appears to be the case, he or she may, in the circumstances, be compelled to deploy the AWS.

A future commander may, for example, have a choice as to whether they should launch a non-autonomous missile as compared to a missile that was capable of carrying out its own proportionality assessment once it got closer to its target. And, while it is true that he or she will not always be obliged to the AWS, there are some circumstances where they will be.

3.4.7 Part 4: In Sum.

Part 4 has considered two final IHL concepts, military necessity and the duty to take precautions in attack. However, while opponents of AWS have identified these as independent grounds for supporting the *Prohibition,* this analysis has shown that in reality, such musings are merely a rephrasing of existing distinction and proportionality arguments. In the first instance, necessity cannot provide a legal mechanism by which to establish the lawfulness (or not) of Aws, but rather a mechanism to try to ensure IHL is applied as best it can be. Vitally, the subjective elements opponents identify can

[723] Grimal and Pollard (2012), *ibid*, n.4, 686-694 in particular.
[724] See e.g., J Beldon – Lethal Autonomous Weapons Systems: Humanity's Best Hope? (*Leading Edge*, 1 September 2015) https://leadingedgeairpower.com/2015/09/01/lethal-autonomous-weapons-systems-humanitys-best-hope/ accessed 2 February 2021.

prevent a universal, or fair application of IHL. Nevertheless, the introduction of increasingly intelligent AWS might start to address this. This section also considered the combatants duty to take precaution in attack. It noted, that rather than supporting the prohibition, feasible precautions may eventually *ensure* that a commander deploys an AWS where less civilian harms would arise as a result.

3.4.8 Chapter Three Conclusion.

Chapter Three has considered the second legal discipline that will govern AWS deployments - the *jus in bello*. Part 1 established that at its heart, IHL attempts to providing an unbiased mechanism for balancing humanitarian concerns and military necessity. And each of these central aims of IHL have been used to support calls for a prohibition of AWS. The analysis demonstrated that opponents have also grounded their argument in the cardinal principle of distinction, and the accompanying principle of proportionality. However, while it is true that AWS are currently incapable of adhering to the principle of distinction and proportionality in all battlefield environments, this cannot comprehensively preclude recourse to AWS in all armed conflicts. Indeed, states will continue to deploy existing AWS into environments where no civilians, or at least very few civilians or combatants are present. This is important, because teleological developments are likely to lead to a situation where AWS will be capable of applying these key IHL principle with greater precision than humans. Indeed, this is the primary reason why the development of AWS must be allowed to continue subject to the rules identified throughout.

Regardless of the inability to conduct distinction and proportionality assessments in any great detail, Part 3 confirmed that that is still possible for a commander to lawfully deploy an AWS, where their assessment is sufficient - though this would need to be assessed by the commander on a case-by-case basis. Part 2 demonstrated that although the use of AWS would, in some instances, be particularly controversial, the introduction of increasingly advanced AWS provides the international community with an opportunity to address some of the uncomfortable questions that already exist regarding the value of certain targets, and their corresponding civilian harms.

Finally, Part 4 considered two further IHL concepts, military necessity and the duty to take precautions in attack. This section identified that although opponents have

identified these as being independent grounds for supporting the *Prohibition,* these arguments are fundamentally a rephrasing of existing distinction and proportionality discussion. As a result, necessity and the duty to take precautions, were utilised to support the researcher's hypothesis, rather than argue against it. AWS are capable of promoting humanitarian considerations, while at the same time offering strategic advantages. This chapter has noted that adherence to IHL may only initially be possible if the operating environments of AWS are restricted to locations where civilians are not typically present. Such restrictions however also provide nations, and weapons contractors, the opportunity to continue to develop the tech that might ultimately be responsible for saving the lives of many combatants and civilians alike. Somewhat importantly, there is no overwhelming evidence to suggest that AWS are inherently unlawful weapons. But, more than enough to show that the regulation of AWS should be given the highest priority.

CHAPTER 4. ASSESSING THE LAWFULNESS OF AUTONOMUS WEAPONS SYTEMS UNDER INTERNATIONAL HUMAN RIGHTS LAW.

Chapter Introduction.

Chapter Four continues the analysis of Autonomous Weapons Systems (AWS) in respect of a third and final legal discipline that is applicable to their use in armed conflict – International Human Rights Law (IHRL). Naturally, while the relationship between IHRL and those disciplines previously considered is in general 'complex, contested and evolving',[725] Chapter Four's focus is placed upon those IHRL areas of contention which appear to be most at odds AWS deployments. Therefore, the following analysis begins by considering the applicability of IRHL in armed conflict, doing so, *inter alia*, to identify whether IHRL is applicable to extraterritorial military operations.

It is particularly important to establish this, not least because Part 2 examines the lawfulness of use of so-called 'hunter-killer drones'. Part 3 scrutinises the use of AWS alongside one of the most foundational of all human rights - the Article 6 ICCPR Right to Life.[726] Finally, Part 4 assesses a number of further IHRL obligations that may affect the lawfulness of AWS deployments, namely Articles 7, 9, and 14 ICCPR. As previously, this chapter is intended to support the hypothesis that international law does not absolutely prevent the use of AWS. And, in support of the thesis' aim of constructing a legal framework to regulate AWS, where the researcher identifies a proposition that is key to AWS deployments, this is presented as a rule.

PART 1. The Applicability and Functioning of International Human Rights Law in Armed Conflict.

Compared to the two legal disciplines previously considered, IHRL is both relatively new,[727] and somewhat unfamiliar. The unfamiliarity arises primarily because, unlike

[725] Jens David Ohlin, The inescapable Collision, in Jens David Ohlin (ed.) *Theoretical Boundaries of Armed Conflict and Human Rights* (Cambridge University Press, 2016), 1.
[726] Art. 6 ICCPR, *ibid*, n.602.
[727] The first international human rights treaty, the Universal Declaration of Human Rights (1948) 217 A (III) (hereinafter UDHR) coming eight decades after the St. Petersburg Declaration (1868), *ibid*, n.138.

those bodies of law previously considered, IHRL is applicable at all times, including in peacetime.[728] As a result, there can often be conflict between IHRL and other legal disciplines – most specifically, International Humanitarian Law (IHL). This can best be demonstrated by contrasting the Article 6 ICCPR right to life with the combatants privilege. While the former ensures *the state* must a*bsolutely* prevent the arbitrary taking of life, the latter allows for a combatant to inflict injury and kill without fear of prosecution. Although Article 6 does provide a useful comparison for present purposes, its influence upon AWS deployments is examined in greater detail in Part 2. The aim of Part 1 is to identify how IHRL should be applied in armed conflict, and especially in light of contradictory legal disciplines such as IHL. The Part 1 analysis also identifies the applicability of IHRL obligations when AWS are utilised to conduct operations extraterritorially.

4.1.2 The Relationship Between International Humanitarian Law and International Human Right Law.

This section identifies the relationship between IHL and IHRL in order to demonstrate why IHRL obligations are relevant to all AWS deployments. This analysis begins by returning briefly to the previous chapter. The reader will recall that there, the researcher identified IHL provides the rules and obligations, of which belligerents, including those responsible for authorizing AWS, must adhere to when involved in military operations. And, until relatively recently, the general rule was that IHRL need not go where IHL goes.[729] That is not to say that 'human rights' have not influenced the drafters of IHL treaties. Article 75 API,[730] Article 4 APII,[731] and, Common Article 3 of the Geneva

[728] Though note, for example, that art. 4 ICCPR, *ibid*, n.603. This states '[i]n time of public emergency which threatens the life of the State and the existence of which is officially proclaimed, the States Parties to the present Covenant may take measures derogating from their obligations under the present Covenant to the extent strictly required by the exigencies of the situation, provided that such measures are not inconsistent with their other obligations under international law and do not involve discrimination solely on the ground of race, colour, sex, language, religion or social origin.' Art. 4(2) identifies the fundamental rights from which there can be no derogation – namely, arts. 6, 7, 8 (paragraphs 1 and 2), 11, 15, 16 and 18. Leaving aside times of public emergency, however, IHRL is applicable at all times. (hereinafter this is referred to the *temporal* application of human rights).

[729] As an independent concept, IHL is a relatively new term. The IHL principles such as distinction and proportionality are no doubt grounded in what is more correctly referred to the laws of war, or the Law of Armed Conflict (LOAC). And these can be traced back to the middle ages. See e.g., Amanda Alexander, 'A Short History of International Humanitarian Law' (2015) 26 1 EJIL 109, 112-113. However, though it may be conceptually possible to separate LOAC from IHL, they share a common history and today the terms are generally used interchangeably. Also see, Dinstein, *ibid*, n.244, para. 57.

[730] Art. 75 API, *ibid,* n.43.

[731] Art.4 APII, *ibid,* n.512.

Conventions,[732] for example, all refer to certain *fundamental* guarantees, and seek ensure that states adhere to them when involved in armed conflict. Previously, this 'nod' to IHRL, and the duly noted need for 'compliance with…[inter alia]…common article 3, would result in respect for IHRL, and vice versa'.[733]

Arguably, given its nature, purpose, and universal application,[734] IHL is better positioned to govern the behaviour of belligerents, and to limit the effects of warfare. Nevertheless, in 1996, in giving its seminal *Nuclear Weapons Advisory Opinion*,[735] the international court of Justice (ICJ) observed that human rights, including obligations such as the right to life, do 'not cease in times of war'.[736] This has since been restated by the Court on a number of occasions, including in the *Wall Advisory Opinion*.[737]

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[732] See, 'The Geneva Conventions of 1949 and their Additional Protocols' (ICRC, 29 October 2010) para. 7. Here the ICRC note '[c]ommon Article 3 establishes fundamental rules from which no derogation is permitted. It is like a mini-Convention within the Conventions as it contains the essential rules of the Geneva Conventions in a condensed format and makes them applicable to conflicts not of an international character.' https://www.icrc.org/en/doc/war-and-law/treaties-customary-law/geneva-conventions/overview-geneva-conventions.htm accessed 12 July 2021. Also see, Dinstein, *ibid,* n.244, para. 20, Here the author identifies that, '[t]he framers of the four Geneva Conventions for the Protection of War Victims (concluded in 1949 and currently in force for every existing state) ushered in a new era by crafting for the first time an agreed-upon text relating directly to LONIAC…[Law of Non-International Armed Conflict]...This is Common article 3 of the four Conventions. Admittedly, the language chosen by the drafters consists in the main of broad-brush strokes rather than specifics, but it must never be forgotten that it was Common Article 3 which blazed a new Trail in the terrain of NIAC law.'

[733] Corn *et al*, *ibid,* n.632, 19.

[734] IHL is applicable to every party involved in an armed conflict, equally and without regard for concepts such as the nature of relationships, and/ or the party to which a particular belligerent is aligned. On the other hand, IHRL generally only applies to a state (or agents thereof), it being only the state who is able to effectively 'deliver' IHRL. See e.g., Prosecutor v. Kunarec *et al*. (ICTY, Trial Chamber, 2001), para. 463 (hereinafter *Kunarec Case*). For a useful discussion also see, Dinstein, *ibid.,* n.244, para. 78.

[735] *Nuclear Weapons Advisory Opinion, ibid*, n. 73, para. 25.

[736] *Ibid.* Before providing its judgement the court noted that a number of leading commentators had argued that the ICCPR rights made no mention of war or weapons, and it had never been envisaged that the legality of nuclear weapons was regulated by that instrument. The court also identified that those in support of that proposition suggested that the ICCPR was designed to apply in peacetime, and, as a result the use of force should be judged by the law applicable to armed conflict, in other words, by international humanitarian law (IHL). Nevertheless, in contrast, the ICJ observed that 'the protection of the International Covenant on Civil and Political Rights does not cease in times of war, except by operation of Article 4 of the Covenant whereby certain provisions may be derogated from in a time of national emergency.'

[737] Advisory Opinion on the Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory [2004] ICJ Rep 136, 106 (hereinafter *Wall Advisory Opinion*). Here the court state '[a]s regards the relationship between international humanitarian law and human rights law, there are thus three possible situations: some rights may be exclusively matters of international humanitarian law, others may be exclusively matters of human rights law, yet others may be matters of both these branches of international law'. Since these seminal cases, this part of the judgement has been repeated by a number of international hard and soft legal sources. See e.g., Helin M Laufer, 'War, Weapons and Watchdogs: An Assessment of the Legality of New Weapons under International Human Rights Law' (2017) 6 1 Cambridge International Law Journal, 62, 65. Here the author notes for example, 'regional human rights courts, the Human Rights Committee, and the International Law Commission' have all restated the fact

While the following analysis will show that many IHRL provisions do, *prima facie*, appear at odds with IHL, the applicability of IHRL in armed conflict is well established. Consequently, the following is annexed,

RULE 33
Any State deploying AWS in armed conflict that is a party to the relevant IRHL treaties, must have regard to the obligations contained within those treaties. In addition, should any IHRL provision be regarded as customary in nature, then any states deploying AWS will be bound by that rule (subject to RULE 34).

4.1.3 *Lex Specialis Derogat Legi Generali*.

As a result of, *inter alia*, the ICJ's insistence that it is applicable in armed conflict, IHRL does undoubtably affect the lawfulness of AWS deployments. This is despite the fact that, as previously noted, there are clear examples of where IHRL obligations conflict with those arising under IHL – the latter being a body of law which has evolved over centuries of warfare with a single purpose of governing the behaviour of belligerents. The researcher examines the workings of this, sometimes awkward, relationship in much greater detail in the ensuing analyses, but with specific regard to AWS.

The purpose of Part 1 is first to identify the applicability and functioning of IRHL in armed conflict. For present purposes, therefore, it is important to identify the legal concept of *lex specialis derogat legi generali*.[738] This ensures that where there is a discrepancy, or conflict, between two legal disciplines (in respect of the present discussion - between IHRL and IHL) the more focused, specific, norms must be applied before, or instead of, those which are more generally applicable.

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that IHRL is applicable in armed conflict.' Laufer identifies the following cases where the ICJ have noted the same, *Armed Activities Case*, *ibid*, 397, 206, Coard v United States (1999) I/ACommHR, Rep No 109/99, para. 39, Hassan v United Kingdom App No 29750/09 (ECtHR, 16 September 2014), para. 87, For further discussion also see, International Law Commission, 'Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law' (1 May – 9 June and 3 July – 11 August 2006) UN Doc A/CN.4/L.682, para. 104, and Dinstein, *ibid,* n.244, para. 89.

[738] This is translated to read 'special law repeals general laws'. See e.g., 'lex specialis derogat legi generali' (Oxford Reference) https://www.oxfordreference.com/view/10.1093/acref/9780195369380.001.0001/acref-9780195369380-e-1303 accessed 11 July 2021.

This has been acknowledged by the ICJ in both the *Nuclear Weapons Advisory Opinion*,[739] and the *Wall Advisory Opinion*.[740] In addition, the ICTY trial chamber has also stated,

> '…notions developed in the field of human rights can be transposed in international humanitarian law only if they take into consideration the specificities of the latter body of law.'[741]

It is important to note that *lex specialis* should applied to individual obligations/ provisions, and not to a whole legal discipline. In other words, one cannot simply argue that IHRL is not applicable to AWS deployments because IHL provides the more specific obligations. In addition, while some have argued that the relationship between IHL and IHRL is much more nuanced than a mere simple rule which holds IHL norms must prevail over inconsistent rules of IHRL,[742] such discussions remain theoretical.[743] Therefore, the following rule should be borne in mind when considering the following analyses,

RULE 34
Rights conferred by IHRL are applicable to all AWS deployments. Where these rights are, however, incompatible with the *lex specialis derogat legi generali* of IHL, the latter must prevail over the *lex generalis* of IHRL.[744]

4.1.4 Extraterritorial Application of International Human Rights Law.

There is no doubt that IHRL obligations must be applied during armed conflict. That is, albeit, alongside those which arise under IHL, and sometimes conditional upon those

[739] *Nuclear Weapons Advisory Opinion, ibid,* n.73, 240.
[740] *Wall Advisory Opinion, ibid.,* n.737, 178. For a useful discussion see, Dinstein, *ibid*, n.244, paras. 89-92.
[741] *Kunarec Case*, *ibid,* n.734 para. 471.
[742] See generally e.g., Marko Milanovic, 'The lost Origin of *Lex Specialis*: Rethinking the Relationship Between Human Rights and international humanitarian law,' in Jens David Ohlin (ed.) *Theoretical Boundaries of Armed Conflict and Human Rights* (Cambridge University Press, 2017), Ohlin, *ibid*, n.725, 14. For a contrasting perspective see generally, David Luban, 'Military necessity and the cultures of military law' (2013) 26 Leiden J. Int'l L., 213
[743] They have not, for example, received substantial backing from the international community or courts.
[744] Dinstein, *ibid,* n.244, para. 90-91.

arising under IHL. There is, however, a second fundamental difference between these two oft-conflicting legal disciplines which could have a fundamental impact upon IHRL applicability to AWS. It is that IHL and IHRL bind states in two very distinct ways. As succinctly summarised by the International Criminal Tribunal for the Former Yugoslavia (ICTY) trials chamber,

> '[h]uman rights law is…born out of the abuses of the state over its citizens and out of the need to protect the latter from state-organized or state-sponsored violence… [while] … [h]umanitarian law aims at placing restrictions on the conduct of warfare so as to diminish its effects on the victims of the hostilities.'[745]

In other words, IHRL confers rights upon humans, without the intervention of the state, while IHL obliges a state (and its agents) to behave in a certain manner. This raises one question that is especially relevant to AWS extraterritorial deployments. In short, it concerns the matter as to whether a state must adhere to its IHRL obligations when conducting armed operations only within their sovereign territory (where they have a considerable influence and a high chance of ensuring IHRL is applied), or whether the IHRL obligations must also be applied when operating extraterritorially (where they may have much less of an influence, and very little chance of completely ensuring IHRL are applied).

It is clearly important to identify whether the requirement to adhere to IHRL obligations can be switched on and off. If this were the case, for example, it must be reflected upon within the context of the *Template.* And, *prima facie*, the ICCPR does appear to provide a limitation. It states, for example, that an individual claiming that their rights have been breached, must in some way be demonstrate that at the time of the breach they were 'within the territory and subject to its…[the states]…jurisdiction'.[746] A narrow interpretation is supported by a number of states in opposition to the extraterritorial application of IRHL.

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[745] *Kunarec Case ibid.,* n.734, para. 470.

[746] Art. 2(1) ICCPR, *ibid,* n.602. This states, 'Each State Party to the present Covenant undertakes to respect and to ensure to all individuals within its territory and subject to its jurisdiction the rights recognised in the present Covenant, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.'

Perhaps the most of these is the U.S., which has historically, and repeatedly, refused to accept the universal application of IHRL - *jus cogens* obligations aside. [747] In other words, the U.S. has previously stated that the ICCPR does not apply outside of its sovereign territory.[748] In the view of the U.S., 'IHL is the primary, if not the exclusive, source of international regulation to IACs'.[749] This position has also been also adopted, for example, by Israel, who have similarly claimed in the past that 'the Covenant [ICCPR] and similar instruments did not apply directly to the current situation in the occupied territories'.[750]

Nonetheless, these stated opinions are in the minority. In contrast, the widely accepted view is that the fundamental rights arising under IHRL treaties *are* to be applied by militaries (the state) when operating overseas. This is of course key to AWS deployments, and is therefore recognised by the following rule,

RULE 35
IHRL must be applied concurrently with IHL during both Non-International Armed Conflicts (NIAC) and International Armed Conflicts (IAC).[751]

[747] See e.g., Corn *et al, ibid,* n.632, 35. The authors note that regardless of the U.S.'s adopted position, a number of human rights obligations are customary in nature including the 'prohibition from murder, torture, or other cruel, inhumane, or degrading treatment or punishment or prolonged arbitrary detention'. For further discussion also see, Michael N. Schmitt, 'Extraterritorial Lethal Targeting: Deconstructing the Logic of International Law'(2013) 52 Colum. J. Transnat'l L. 77, 109-10, Ohlin, *ibid*, n.725, 2. Here, for example, the author notes 'if the ICCPR does not apply extraterritorially, then there will be no conflict between IHL and IHRL during extraterritorial military actions (with the exception of jus cogens obligations).'

[748] Ohlin, *ibid,* n.725, 5. Perhaps aware of the growing international tendency to recognise extraterritorial application, the legal advisor to the U.S. Department of State under the Obama administration, Harold Koh, signed a memorandum calling for the U.S. government to change is position. See, Harold Koh, 'Legal Advisor, U.S. Department of State, Memorandum Opinion on the Geographical Scope of the International Covenant on Civil and Political Rights' (October 19 2010), <https://www.justsecurity.org/wp-content/uploads/2014/03/state-department-iccpr-memo.pdf> accessed 21 October 2020. At the time of writing, however, U.S. opposition to the extraterritorial application of the ICCPR remains.

[749] Corn *et al*, *ibid,* n.632, 19.

[750] *Wall Advisory Opinion, ibid,* n.737, para. 110.

[751] Corn *et al, ibid,* n.632, 19.

This rule is likely to be supported by the ICJ, who, for example, have previously noted[752] that the ICCPR obligations are primarily, though not necessarily, territorial.[753] In short,

RULE 36
IHRL is applicable in respect of acts done by a State in the exercise of its jurisdiction outside its own territory.[754]

Therefore, IHRL follows State armed forces wherever they operate.[755] The nature of these obligations to respect IHRL are not, however, absolute. Instead, they are *limited* by the element of 'control'. With regards the extraterritorial application of the Article 6 Right to Life, for example, the Human Rights Committee (HRC) have suggested, [756]

> '[i]n light of article 2, paragraph 1, of the Covenant, a State party has an obligation to respect and to ensure the rights under article 6 of all persons who are within its territory and all persons subject to its jurisdiction, that is, all persons over whose enjoyment of the right to life it exercises power or effective control…This includes persons located outside any territory effectively controlled by the State, whose right to life is nonetheless impacted by its military or other activities in a direct and reasonably foreseeable manner.'[757]

[752] *Wall Advisory Opinion*, *ibid*, n.737, paras. 109-112.
[753] Daniel Møgster, 'Towards Universality: Activities Impacting the Enjoyment of the Right to Life and the Extraterritorial Application of the ICCPR' (EJIL: Talk!, 27 November 018) < https://www.ejiltalk.org/towards-universality-activities-impacting-the-enjoyment-of-the-right-to-life-and-the-extraterritorial-application-of-the-iccpr/ > accessed 11 July 2021 .
[754] *Wall Advisory Opinion, ibid,* n.737, para. 111.
[755] Corn *et al*, *ibid,* n.632, 19.
[756] A statutory body made up of independent members who monitor the implementation of the fundamental rights stemming from the ICCPR.
[757] See, Human Rights Committee, 'General comment No. 36 on article 6 of the International Covenant on Civil and Political Rights, on the right to life.' CCPR/C/GC/36 (30 October 2018), para. 63.

This is not the only time the element of *control* has been forwarded by the HRC.[758] And, a number of states have adopted a variation of an 'effective control test'.[759] Although the General Comment (above) was made in relation to a single ICCPR provision, there is no doubt that this is an 'important development that is likely to shape future practice',[760] even if it only expands the definition of jurisdiction (as per Article 2(1) ICCPR) , to include 'impact' as a method of control.

As a consequence, the following is annexed,

RULE 37
Where a State deploys AWS extraterritorially, and they are a party to the relevant IHRL treaties, they must have regard to the obligations stemming from those treaties.

RULE 37 is central to the functioning of the *Template* with regards to IHRL, because, *inter alia,* the fact that IHRL is not restricted either temporally or geographically, means that an additional *Template* axis is not required.

4.1.5 The applicability of Human Rights in Armed Conflict: In Sum.

IHL was, for many years, the sole legal discipline responsible for governing the behaviour of belligerents in armed conflict. More recently, there is widespread international recognition that the temporal application IHRL is unrestricted. This

[758] Human Rights Committee, 'General Comment No. 31 The Nature of the General Legal Obligation Imposed on States Parties to the Covenant', CCPR/C/21/Rev.1/Add. 1326 (May 2004), para 10. This states, 'The Nature of the General Legal Obligation Imposed on States Parties to the Covenant States Parties are required by article 2, paragraph 1, to respect and to ensure the Covenant rights to all persons who may be within their territory and to all persons subject to their jurisdiction. This means that a state party must respect and ensure the rights laid down in the Covenant to anyone within the power or effective control of that State Party, even if not situated within the territory of the State Party. As indicated in General Comment 15 adopted at the twenty-seventh session (1986), the enjoyment of Covenant rights is not limited to citizens of States Parties but must also be available to all individuals, regardless of nationality or statelessness, such as asylum seekers, refugees, migrant workers and other persons, who may find themselves in the territory or subject to the jurisdiction of the State Party. This principle also applies to those within the power or effective control of the forces of a State Party acting outside its territory, regardless of the circumstances in which such power or effective control was obtained, such as forces constituting a national contingent of a State Party assigned to an international peace-keeping or peace-enforcement operation.'

[759] Typically, these require an that there must be an element of effective control over an individual, a situation, or a territory, in order for a duty to arise. For a discussion see generally e.g., Oona A Hathaway, Philip Levitz, Elizabeth Nielsen *et al,* 'Human Rights Abroad: When Do Human Rights Treaty Obligations Apply Extraterritorially' (2011) 43 Ariz. St. L. J. 389.

[760] Møgster, *ibid*, n.753, para. 11.

means that all states conducting military operations, and specifically those involving AWS deployments, must have full consideration of IHRL at all times. Where two or more legal principles are incompatible, however, the *lex specialis derogat legi generali* of IHL must prevail over the *lex generalis* of IHRL. When AWS are deployed overseas, signatories must have regard for the obligations arising from IHRL treaties. This geographical application of IHRL can only be 'enforced' subject to the concept of control.

PART 2 The Lawfulness of Autonomous Extraterritorial Targeted Strikes.

Part 2 continues with the primary aim of assessing the lawfulness of AWS. The analysis that follows is different from those conducting in previous chapters, however, because it considers a particular *type* of attack - autonomous extraterritorial targeted strikes. The following examination is necessary due to the fact that critics have identified so-called hunter-killer drones as the antithesis of evil, and a primary reason that AWS need to be prohibited.[761]

As the following analysis demonstrates, any discussion considering autonomous extraterritorial targeted strikes must have reference to all three bodies of law that are relevant the use of AWS in armed conflict. Thus, the investigation could have been positioned in the those considering the *jus ad bellum* or the *jus in bello*. In addition, there are genuine ethical concerns regarding the types of attack under investigation.

Ultimately, however, the discussion regarding autonomous extraterritorial strikes is positioned in this chapter for two primary reasons. First, the researcher has already examined two of the three disciplines in detail so the reader should have a level of familiarity with the concepts considered. But second, and perhaps most importantly, IHRL provides the legal norms (and thesis rules) which most restricts AWS from being used in this manner. The following investigation shows this to be the case, not least because targeted strikes tend to be regarded as acts falling short of armed conflict, thus there is no recourse to the *lex specialis* of IHL. [762]

[761] See, for example, the previous discussion regarding hunter-killer drones, *ibid,* n.207. In addition, see the discussion regarding 'slaughterbots' (a form of the same weapon), *ibid,* n.209.
[762] Indeed, because IHRL is applicable it all times, it is relevant to AWS when deployed for municipal purposes such as policing. Where police utilise AWS for riot control, for example, the level of violence deployed would generally fall below that which is required for it to be considered an armed-conflict. See

4.2.2 Hunter-Killer Drones.

Before the focused analysis is conducted, two fundamental elements of the discussion need first to be defined. First, the specific 'type' of AWS is introduced, namely, autonomous hunter killer-drones. While the second element that is considered is extraterritorial strikes. Autonomous hunter-killer drones are considered individually, because they (or, at least, some version of them), are regularly referred to in the literature. Indeed, this is the primary reason the present researcher has routinely referred to this type of AWS.

While there is a good deal of reference to such systems throughout the literature, however, it is vital that hunter-killer drones are defined for the sake of the present analysis. This is, not least, because they can be classified upon the *Template* in a number of different ways. In their most fundamental form, and similar to an existing UAV, a hunter-killer drone would be a platform.

The UAV is perhaps the most common imagining of this AWS, noting that platform classification would also encapsulate humanoid robots, such as those imagined by Hollywood. As a reminder, platforms receive a basic *Template* classification of L2AWS. [763] Hunter-killer drones, therefore, are defined as **recoverable systems** *which, once activated, are capable of identifying, selecting and, engaging targets, free from further human coercion (though not necessarily from human supervision)*.

As with all AWS, one way this *Template* classification could change would be with regard to inter-connectivity with other autonomous systems, and the types of delegated decisions that are delegated to them. For example, where operating as one element of a wider autonomous system, *Template* classification would be rounded up to L3AWS. Moreover, where either the single unit, or wider system, was capable of a making

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e.g., art. 1(2) APII , *ibid*, n. 512 stating 'this protocol shall not apply to situations of internal disturbances and tensions, such as riots, isolated and sporadic acts of violence and other acts of a similar nature, as not being armed conflicts. Municipal uses of AWS fall outside of the remit of the present thesis. Nonetheless for a useful discussion see generally, Christof Heyns, 'Human Rights and the Use of Autonomous Weapons Systems (AWS) during Domestic Law Enforcement', 38 HUM. RTS. Q. 350 (2016), and, Andrea Spagnolo, 'Human rights implications of autonomous weapon systems in domestic law enforcement: sci-fi reflections on a lo-fi reality' (2017) 43 QIL, Zoom-in 33 (2017).

[763] Note basic classification is intended to mean L1-L4 only, whereas advanced classification relates to all three axes.

strategic level decisions (such as authorizing the use of, or deploying a weapon of mass destruction) the use a L4AWS *Template* classification would be applied.

There are, however, a number of alternative ways hunter-killer drones might be classified on the *Template*. For example, in the first instance a hunter-killer drone could be a L1AWS such as the Harpy previously considered. Existing Harpy's can loiter for around eight hours, but the researcher believes there this could potentially be extended by utilising an alternative power source such as solar. Nevertheless, eight hours of operation post human authorisation, is arguably a more than sufficient period of time in which to consider the weapon autonomous.

While existing Harpy's are designed to target RADAR installations, there is also no reason that target types could not also be expanded upon for future operations. Crucially, though, the Harpy *is* the weapon, and is therefore a L1AWS. Once again, when operating as part of a wider system, the Harpy's *Template* classification is rounded up. However, this would also apply to weapons such as the 'slaughterbots' that have been identified by NGO's such as ICRAC and HRW.

The creators of the slaughterbot video imagine a swarm of small munitions being deployed at some distance from person authorising their use. And, these are pre-programmed to target, strike and kill individuals based on certain pre-identified criteria. Clearly when operating in this manner, such a system is a L3AWS. However, it is important to note that while this Aws is typically referred to as a swarm (and that term still applies) it is also considered here as a hunter-killer drone (albeit, in reality, being a number of much smaller hunter-killer drones, than the hunter-killer UAV typically imagined).

4.2.3 Extraterritorial Targeted Strikes.

Having identified the breath of weapons that are encapsulated by the term hunter-killer drone, this section defines the second key element of the Part 2 discussion - extraterritorial strikes. This is one of the most controversial applications of contemporary weapons technology, which typically utilises a remotely piloted UAV to target and engage specific *valuable* individuals.[764] An *individual* will have been pre-

[764] See e.g., Schmitt, *ibid,* n.747, 100.

identified, and often, the elimination of said individual is at the heart the extraterritorial operation. These are commonly referred to as targeted killings, [765] though they are also called extrajudicial executions,[766] and/ or assassination.[767]

In addition to *value* targets, a second category of individual is often targeted due to their *behaviour*. The operator of a UAV may, for example, choose to fire upon individuals that they believe are an adversary based upon a particular behavioural pattern. This second category of attacks are referred to a signature strikes.[768] And, while the ensuing discussion predominantly refers to targeted strikes, the overall analysis can be applied to both.

Extraterritorial targeted strikes are controversial for a number of reasons. First, they generally target members of Non-State Armed Groups (NSAG) as opposed to members of established states forces.[769] Therefore, there is often a question of doubt as to whether the targeted party can be said to be a*ctively* or *directly* participating in hostilities.[770] In addition, targeted strikes often occur without the consent of the State in which the targeted individual is located. [771]

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[765] See generally e.g., Public Committee Against Torture in Israel v. Israel, Israel Supreme Court [16 December 2006] 46 ILM 375 (hereinafter *Targeted Killings Case*), Dinstein, *ibid,* n.244, paras. 316-318, Ohlin, *ibid*, n.725, 20.

[766] Noting that extrajudicial executions are considered to be a breach of art. 6 ICCPR, *ibid*, n. 602. For a useful discussion regarding targeted killings, assassination, and extrajudicial killings (or not), see, Charli Carpenter, 'Assassination, Extrajudicial Execution, or Targeted Killing—What's the Difference?' (Foreign Policy, 10 January 2020) < https://foreignpolicy.com/2020/01/10/targeted-killing-assassiState-extrajudicial-execution-targeted-killing-illegal-trump-iran-suleimani/> accessed 5 November 2020.

[767] The articles of the Hague Conventions 1907, *ibid*, n.138 including the international prohibition on assassination that is contained/ implied within art. 23(b) are generally considered to customary in nature. See e.g., 'Treaties, State Parties and Commentaries' (ICRC) para. 4 https://ihl-databases.icrc.org/ihl/INTRO/195 accessed 11 July 2021. Here the ICRC note: 'In 1946 the Nüremberg International Military Tribunal stated with regard to the Hague Convention on land warfare of 1907: "The rules of land warfare expressed in the Convention undoubtedly represented an advance over existing International Law at the time of their adoption ... but by 1939 these rules ... were recognised by all civilized States and were regarded as being declaratory of the laws and customs of war"'

[768] See generally e.g., Kevin Jon Heller, ''One Hell of a Killing Machine': Signature Strikes and International Law' (2013) 11 1 Journal of International Criminal Justice 89, and, Amy Byrne, 'A Dangerous Custom: Reining in the Use of Signature Strikes outside Recognized Conflicts' (2018) 86 Geo. Wash. L. Rev. 620 (2018).

[769] The capitalisation 'NSAG' is used in both singular and plural sense.

[770] For a discussion regarding the concept of civilian participation in hostilities with regard to AWS, see Chapter Three, section 3.2.3. For a wider discussion of civilian participation see generally, ICRC DPH guidance, *ibid*, n.558.

[771] Though one cannot absolutely certain whether or not a 'behind closed doors' agreement might exists for strategic reasons.

One previously identified rule, which is key in the following analysis, is RULE 27 prohibiting AWS from treating humankind as a target, type of target, or a group of targets. This RULE prohibits the use of AWS such as 'slaughterbots', hypothetical AWS that target individuals based upon certain human characteristics. If a state were to programme an AWS to target *any/ all* enemy combatants with lethal force, the instruction would also potentially breach RULE 5 – noting that, subject to international law and the RULES herein non-lethal strikes may be permissible (RULE 7). Nevertheless, it is vital to note that RULE 27 does not, absolutely, prohibit autonomous extraterritorial targeted strikes. This is because, targeted strikes will typically be based upon the pre-identification of a person of interest, and/ or a specific behaviour. In such an instance, therefore human-kind in general is not necessarily being targeted.[772]

4.2.4 How International Human Rights Law Restricts the Use of Autonomous Hunter-Killer Drones.

United Nations (UN) Special Rapporteur Cristof Heyns has argued that if states were to conduct targeted strikes with AWS, it could 'seriously undermine the ability of the international legal system to preserve a minimum world order.'[773] There is clearly some weight to this statement. The purpose of this section is to first identify why Heyns believes this to be the case, and secondly, to demonstrate how IRHL already provides the necessary means (and thesis RULES) for ensuring AWS are not used in this manner. To support the analysis, and to add an element of clarity and authenticity to the discussion, the following hypothetical scenario is presented. As with the scenarios in the previous chapters, the associated analysis is intentionally restricted to only those matters which appear pertinent to the current discussion.

[772] While strikes typically target individuals, as unmanned and autonomous tech improves there is no reason to suggest that States will not choose to attack objects. These may include, for example, weapons manufacturing facilities. An advanced AWS might even be capable of distinguishing an unmanned UAV, from a piloted aircraft, and be programmed to only attack the former (if this was to become possible, no doubt weapons R&D will attempt to counter it in any number of ways). The point here is however, while an attack on personnel would is undoubtably lethal, targeted strikes may also potentially be non-lethal (indeed, Schmitt, *ibid,* n.747 breaks his analysis down into two distinct concepts that are at the heart of the discussion surrounding the lawfulness of targeted killings, i) extraterritoriality, and ii) lethality).

[773] Heyns, *ibid,* n.180, para. 110.

4.2.5 Scenario IV.

Australe's military action into Orientale - Operation Island Storm (see scenario III) - has been ongoing for a number of months. Australe has made significant territorial gains, but Orientale remains in control of a large suburb in the north of the highly populated territory in the west. A civil war (NIAC) has broken out alongside the IAC, and a number of factions with various degrees of loyalties are now regularly involved in the hostilities. Australe forces have taken part in a number of tactical missions supporting a group of rebels referred to as NSAG/ A. While a second group -NSAG/ B - act in support of Orientale. NSAG/ B has a number of strongholds within Orientale territory, and also in several uninhabited mountainous border regions of States not currently participating in the ongoing conflict (located on the continent). NSAG/ B has claimed responsibility for a number of attacks that have resulted in significant civilian casualties within Australe territory (not located near to – and, NSAG/ B has openly referred to these as 'acts of war'.

Having consulted with the executive, an Australe commander deploys an autonomous armed UAV that is pre-programmed with the details of a number of valuable, high level, individuals who are known to have a continuous combat function (CCF) within NSAG/ B.[774] *The hunter-killer drone is solar powered and is, therefore, capable of loitering for indefinite periods of time. The Australe commander has also authorised the hunter-killer drone to operate extraterritorially in the airspace of third-party states where the NSAG is known to have a presence. This includes pre-authorization to seek out and neutralize any, or each of the pre-identified targets upon (autonomous) conformation of targets details.*

4.2.6 Hunter-killer Drones: Returning Briefly to the *jus ad bellum*.

As previously noted, while the overriding purpose of this chapter is the assessment of AWS under IHRL the discussion regarding hunter-killer drones must consider all three legal disciplines relevant to AWS deployments. In the first instance, therefore, hunter killer drones are briefly considered under the *jus ad bellum*. The researcher does not intend to utilise the following discussion to repeat the entire examination conducted in Chapter Two. Instead, the purpose the following section is to introduce a number of

[774] See, *ibid*, n.558.

rules relating specifically to the use of hunter-killer drones to conduct extraterritorial strikes.

With regards to scenario IV, *Australe* is presumed to have deployed the use of a hunter-killer drone in self-defence (there being no indication of a UNSC Resolution). The *jus ad bellum*, therefore, allows for *Australe* to lawfully deploy an AWS in four types of territory, (i) an attacker's territory, (ii) in *Australe* territory, (iii) on the high seas, and (iv) in international airspace.[775] These are each considered below.

The first point to consider is that an attack on territory (i) is grounded in the assumption that a state acting in self-defence does so in response to an armed-attack by another state.[776] In scenario IV, the AWS is clearly deployed to target members of NSAG/ B. Therefore, by implication, the organisation to which the individuals belong would very likely lack actual sovereign territory.[777]

For the sake of the present discussion, territory (ii) is also largely irrelevant. This leaves two types of territory in which *Australe* may lawfully defend itself with the use of an AWS (subject, of course, to all other relevant legal principles considered in Chapter Two) With that in mind,

[775] Schmitt, *ibid,* n.747, 84.
[776] Noting that where self-defence cannot be qualified, the 'defending state' will likely be seen as the aggressor.
[777] There is an argument that if a NSAG were to hold sufficient territory and was capable of acts in much the same way as a government, it could be considered a de facto state, and thus, be a party to an IAC. This is thought to be the case with the Taliban in the military action following the attacks on the World trade Center in New York, 11 September 2001. See, Dinstein, *ibid,* n.244, paras. 171-176. Also see, *Nicaragua Case, ibid*, n.309, 195 with regard to proxy wars. Here, the court supplies that if a NSAG can be identified as acting on behalf of a state, that state may be open to lawful attack in an action of self-defence. In scenario IV there is no evidence of that – and regardless, even if it were considered to be a de facto ruler of Orientale, it would already be involved in an ongoing armed conflict. As a result, it is unlikely that A*ustrale* could lawfully deploy a Hunter-Killer drone in first of the four territories. For the rules on statehood including the formation thereof see, The Montevideo Convention on the Rights and Duties of States (1933). Note in particular art. 1 which states: 'The state as a person of international law should possess the following qualifications: a) a permanent population, b) defined territory, c) government, and d) capacity to enter into relations with other states.' The final requirement here is of significant note – with the vast majority of states unwilling to conduct significant relations with NSAG, it would be unlikely to qualify.

RULE 38
AWS are not prohibited from conducting signature and targeted strikes on the high seas or in international airspace when acting in furtherance of the State operating under its inherent right to individual or collective self-defence (as per article 51 UN Charter).

There is no indication that *Australe* have restricted their AWS to operating only in international airspace and on the high seas. In fact, due to the fact that members of NSAG/ B are located on land, the opposite appears to true. Nevertheless, even when acting in self-defence, a state cannot strike wherever, and whenever it chooses.[778] Indeed, the passage of military (and/ or civilian organs) of one State into the territory of another State is a violation of the sovereignty of the latter.[779] Though there are four recognised exceptions.

The first is by way of UNSC authorisations/ Resolutions. The second is when acting in self-defence. The former may, for example, be for humanitarian intervention.[780] Nonetheless, such matters have already been considered in detail, and they do not need to be readdressed here. A third and fourth exception to sovereignty breaches, however, is neutrality, and consent. Neutrality refers to a state that is not a party to an armed conflict, and not an ally of a party to a conflict.[781] In short, a neutral state will generally not wish to involve itself in an armed conflict, and any act occurring on its territory must be consented to. Therefore, the following is added,

[778] Schmitt, *ibid*, n.747, 77. Here the author notes that President Obama makes this point in his Remarks concerning U.S. policy on targeted killings to graduates at the U.S. National Defense University in 2013. See, Barack Obama, President of the United States, 'Remarks by the President at National Defense University' (May 23, 2013) < http://www.whitehouse.gov/the-press-office/2013/05/23/remarks-president-Stateal-defense-university > accessed 9 July 2019. Note again that art. 2(4) UN Charter, *ibid*, n.143 prohibits: 'threat or use of force against the territorial integrity or political independence of any State…'

[779] Schmitt, *ibid*, n.747, 79.

[780] As previously noted, intervention that has not been authorised by the UNSC is generally considered to be unlawful.

[781] Art. 5 Hague Convention (V), (1907), *ibid,* n.136.

RULE 39
AWS deployments are unlawful where they breach the sovereignty of a third-party state - that is, where they enter the sovereign territory of a state without consent.

Neutrality is a position that entails certain rights and duties, however, and this includes the obligation to expel any the combatants that enter its territory.[782] Where they do not, an exception to the exception, is that a state (such as *Australe*) may lawfully breach the sovereignty of the 'neutral' state in order to 'expel' a belligerent that has taken refuge there. [783] While neutrality is typically only considered in matters regarding State armed forces it may, potentially, be possible to extend it to situations involving an incursion of members of NSAG/ B.

This is key, because

RULE 40
Where AWS locate members of an enemy military or paramilitary that taking refuge in a neutral state, the neutral state must be given an opportunity to expel those members from its territory before the AWS can lawfully apply force.

Therefore, AWS such as hunter-killer drones would need to communicate the location of such belligerents to at least one party. This would significantly affect how hunter-killer drones could operate, as it might reasonably take hours or, dependent upon location, even days for the neutral state to react positively and to attempt to expel said belligerent.[784]

[782] It matters not whether the neutral state is unwilling, or incapable of expelling the combatants taking refuge there. The opportunity must, nevertheless, be given, see, Schmitt, *ibid,* n.747, 82.
[783] *Ibid*. Where the author notes that while not explicitly hard law, it does appear in a number of war manuals and state rules of engagement (ROE). See e.g., U.S. Navy /U.S. Marine Corps /U.S. Coast Guard, *The Commander's Handbook on the Law of Naval Operations*, (NWP 1-14M, MCWP 5-12.1, COMDTPUB P5800.7A 2007), 7.3, Ministry of Defence, *The Joint Service annual of the Law of Armed Conflict* (JSP 383, 1.43(a) (U.K.) 2004), See also, Tallinn Manual, *ibid*, n.143, Rule 92.
[784] A weapons system operating autonomously would be also unlikely be privy to any diplomatic discussions that ensued and, as a result, would also find it extremely difficult to determine whether sufficient time has been allowed. Of course, a human commander could open a second communication pathway with the AWS, but this would simply turn the AWS into a remotely operated platform – and, thus, into a weapon that was extraneous to the thesis discussion.

Even if an AWS was capable of loitering undetected for days at a time, and of respecting the requirement to allow a neutral state sufficient time to expel the belligerent before it launched an attack, it is perhaps questionable whether the a 'high value' target would still be in the line of fire. Nonetheless, even if the AWS could operate in such a manner that it maintained a line of sight with said individual, it (and/or the commander authorising its use) would need to have due regard to the GPs that were identified in Chapter Two with regards to the *jus ad bellum*.

Perhaps the most pertinent to the present discussion is RULE 1. This of course states that an AWS must not be delegated decision-making responsibilities regarding the use, or threat of force, other than where such decisions is are taken in self-defence, and only where the need to act is instant, overwhelming and there is no moment for deliberation. This appears to prevent *Australe* from deploying a hunter-killer drone to conduct targeted strikes. Indeed, it is widely accepted that a state may not breach the territorial sovereignty of a third state in pursuit of a NSAG claiming it is acting in self-defence.[785]

Where a state consents to the presence of foreign armed forces, they are prohibited from claiming their sovereignty has been violated.[786] Consent may be given for a number of reasons. For example, it may be given to support an act of self-defence by a 'visiting state', or, conversely, a visiting state may provide support to a third-party state that is engaged in an armed conflict of its own. Nevertheless, a visiting state may only act in, and so far as, the host state provides consent for. Thus, any *act* that was not consented to would amount to a breach of territorial sovereignty.[787] While *Australe* could seek out such consent, the AWS would still be restricted to acting only in situations where the need to act is instant, overwhelming and leaving no moment for deliberation.[788]

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[785] *Wall Advisory Opinion, ibid,* n.737, para. 139.
[786] Schmitt, *ibid*, n.747, 82. Here the author identifies, art. 20, Int'l Law Commission, Responsibility of States for Internationally Wrongful Acts, G.A. Res. 56/83, annex, U.N. Doc. A/RES/56/83 (Jan. 28, 2002) (hereinafter Articles of State Responsibility).
[787] See, Schmitt, *ibid,* n.747, 83. Here the author notes '[u]sing force inconsistent with the terms of any consent by the territorial state would amount to an "act of aggression" against that state'. See, art. 3(e), UN General Assembly Res. 3314 (XXIX), Annex, U.N. Doc. AIRES/3314 (Dec. 14,1974).
[788] Some proponents of autonomous hunter killer drones will no doubt argue that this rule supports a lethal strike, rather than prohibits it, due to the risk of losing the high value target if the Aws was to 'hesitate'. However, this would again be stretching the principle of anticipatory self-defence to breaking point. The point is, in order to invoke its inherent right to self-defence a state must have suffered, or be in imminent danger of suffering, an armed attack.

In sum, this investigation has demonstrated that existing legal provisions of prevent such weapons from being deployed in all but a very few, limited situations. And, if the rules that have been identified thus far are applied, it is arguable that states would be very unlikely to consider AWS as a viable platform from which to conduct extraterritorial targeted or extraterritorial signature strikes – especially given that the lawfulness of such is already highly controversial. A graphic representation of this discussion is presented as follows,

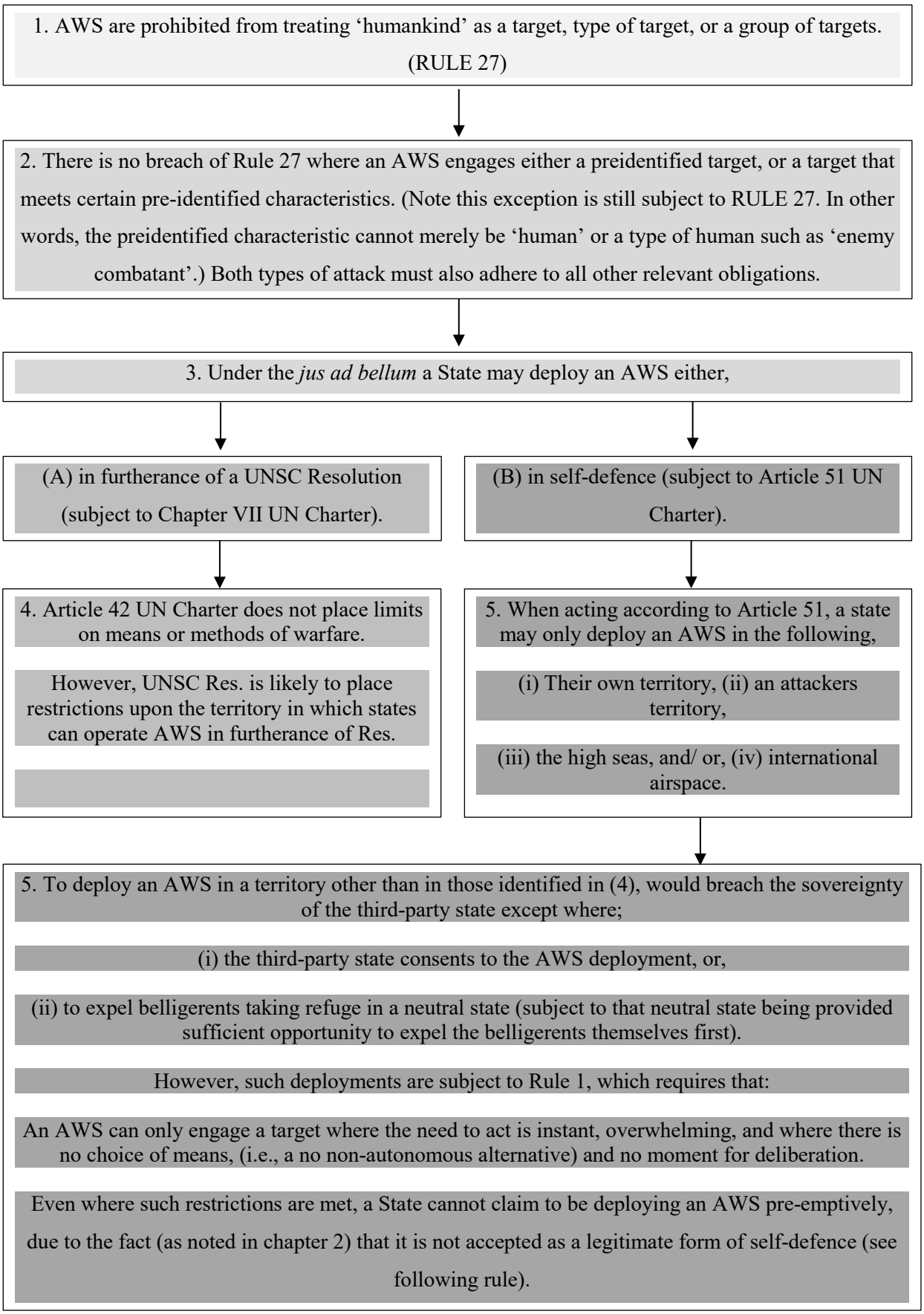
1. AWS are prohibited from treating 'humankind' as a target, type of target, or a group of targets. (RULE 27)
2. There is no breach of Rule 27 where an AWS engages either a preidentified target, or a target that meets certain pre-identified characteristics. (Note this exception is still subject to RULE 27. In other words, the preidentified characteristic cannot merely be 'human' or a type of human such as 'enemy combatant'.) Both types of attack must also adhere to all other relevant obligations.
3. Under the *jus ad bellum* a State may deploy an AWS either,
(A) in furtherance of a UNSC Resolution (subject to Chapter VII UN Charter).
(B) in self-defence (subject to Article 51 UN Charter).
4. Article 42 UN Charter does not place limits on means or methods of warfare.
However, UNSC Res. is likely to place restrictions upon the territory in which states can operate AWS in furtherance of Res.
5. When acting according to Article 51, a state may only deploy an AWS in the following,
(i) Their own territory, (ii) an attackers territory,
(iii) the high seas, and/ or, (iv) international airspace.
5. To deploy an AWS in a territory other than in those identified in (4), would breach the sovereignty of the third-party state except where;
(i) the third-party state consents to the AWS deployment, or,
(ii) to expel belligerents taking refuge in a neutral state (subject to that neutral state being provided sufficient opportunity to expel the belligerents themselves first).
However, such deployments are subject to Rule 1, which requires that:
An AWS can only engage a target where the need to act is instant, overwhelming, and where there is no choice of means, (i.e., a no non-autonomous alternative) and no moment for deliberation.
Even where such restrictions are met, a State cannot claim to be deploying an AWS pre-emptively, due to the fact (as noted in chapter 2) that it is not accepted as a legitimate form of self-defence (see following rule).

Figure 23: The lawfulness of autonomous hunter-killer drones under the *jus ad bellum*.

The following is also provided,

RULE 41
Pre-emption is not a recognised form of self-defence. Thus, this cannot be utilised to support the use of AWS for conducting extraterritorial targeted strikes. Minus an alternative lawful exception, any extraterritorial act of eliminating an individual based either on pre-identification or, upon a set of pre-programmed behaviours and/ or characteristics, is a breach of IHRL obligations, not least Article 6 ICCPR.

4.2.7 Hunter-killer Drones: Returning Briefly to the *jus in bello*.

The following analysis considers the *jus in bello* implications of autonomous hunter-killer drone deployments. At the heart of this discussion is the fact that where there is no armed-conflict, IHL does not apply. Where this is the case, clearly, IHL does not act as the *lex specialis,* and states must have full regard of its IRHL obligations. Somewhat importantly, this includes a provision which requires for the least amount of force as is possible to be used on order to achieve the missions objective. [789]

Where the state of armed conflict does exist, '[a]ll enemy combatants can be lawfully targeted at all times'.[790] Moreover, during warfare, an attack may target combatants either individually, or *en masse*.[791] Significantly, however, the thesis analysis has identified that AWS must not be used to target belligerents, either individually or *en masse*, based purely upon their status.[792]

[789] This concept is considered further below. However, in short, while there is no requirement to capture before killing under IHL, it is widely recognised that the requirement does exist under IHRL.
[790] Dinstein, *ibid*, n.244, paras. 316-318.
[791] *Ibid.*
[792] A commander may lawfully authorise an AWS to strike a pre-identified military compound in the knowledge that enemy personnel would be killed. Additionally, they could also lawfully authorise an AWS to directly target the exact same personnel. They cannot, however, lawfully authorise the deployment of an AWS with an instruction, for example, to target all individuals identified as enemy combatants which were located in wider geographical area containing two or more lawful targets.

As noted in Chapter Three, the list of lawfully targetable individuals includes civilians who are directly participating in hostilities (DPH).[793] And, somewhat relevant to the present discussion, a 'lawful attack of targeted killing can be carried out by sniper fire, an ambush, a commando raid behind the lines, an air strike or the launch of a missile'.[794] As a result, providing there is a state of armed conflict, IHL allows for targeted strikes of the *type* considered in the previous section. IHL does not, therefore, given current interpretations, prevent the use of AWS from being used for targeted strikes. Although, the rules that have been identified regarding the IHL principles of distinction and proportionality, in particular, would significantly restrict hunter-killer drone deployments.

When looking to identify whether autonomous hunter-killer drones are lawful under the IHL, the problem is not with AWS *per se*. Instead, it is the fact that the those targeted by such strikes are 'far removed from what would traditionally be seen as the 'zone of hostilities'.[795] This is vital because, were *Australe* to deploy an AWS to carry out a targeted strike upon an individual or object that was located outside of the existing a battlefield (i.e., outside of *Orientale* territory) - IHRL is the sole body of applicable international law.

In order to assess the lawfulness of an extraterritorial use of AWS, therefore, it is vital to identify the armed conflict in which it is operating.[796] Arguably, this is an easier task with regard to IAC (being between two states), that it is with NIAC (as between a state and one or more NSAGs).[797] Two elements that must be present in order to distinguish a NIAC, from a level of violence that falls below the standard of armed conflict (the latter being governed by IRHL norms and not IHL) are that (i) the NSAG must have a sufficient degree of organisation, and (ii) the violence must have a sufficient degree of

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[793] Art. 51(3) API, *ibid*, n.43. This states, '[c]ivilians shall enjoy the protection offered by this Section, unless and for such time as they take a direct part in hostilities.' See also, *ICRC Customary Rule 6, ibid*, n.518. Here, the ICRC provide that Article 51(3) is customary in nature and thus it is applicable to all states regardless of whether or not they are party to API.
[794] Dinstein, *ibid*, n.244, paras. 316-318.
[795] Heyns *et al*, *ibid*, n.30, 793.
[796] Schmitt, *ibid*, n.747, 94. The author notes that although it can be notoriously difficult to do, identifying a NIAC 'is essential in order to determine whether international humanitarian law or international human rights norms govern a state's extraterritorial lethal targeting' .
[797] See, *Targeted killings case, ibid,* n.756, para.18. Here, the Israeli Supreme court stated that a conflict that transcends borders is international in character. However, in, Lubanga, Case No. ICC-01/04-01/06, Trial Chamber Judgment (hereinafter *Lubanga Case*) the International Criminal Court explicitly states that extraterritorial conflicts are not international unless the armed group is acting under the control of the state.

intensity.[798] Intensity cannot be established from only one attack. Indeed, it does not matter how devastating a single attack might be, that act alone cannot establish a state of armed conflict.[799]

The primary issue with the use of AWS to conduct targeted strikes away from a clearly defined battlespace is that it is simply unclear how the law should be interpreted. Indeed, this is an extremely contentious area of debate. Somewhat importantly, where a battlefield is extraterritorial in nature, and against a NSAG that lacks its own sovereign territory, it is presently unclear whether IHL allows the defending state to operate in search of enemy belligerents.

Traditionally NIACs tended to be rebellious in nature. Thus, they were generally restricted to the territory of the state concerned, where the state in question would be permitted to deploy their AWS of choice.[800] However, the nature of the contemporary NIAC has resulted in a conflict of opinion that is far from settled. Simply put, while one narrative suggests IHL must apply to all acts of armed conflict, extraterritorial or otherwise,[801] an alternative view is that IHL should only apply to acts that are more closely aligned with the traditional battlefield.

Supporters of the latter suggestion argue that the applicability of IHL should reduce the further away from the *hot battlefield* the act occurs.[802] Nevertheless, as noted by one prominent commentator, a black letter interpretation does not appear support this.[803] As a result of the continuing uncertainty in this area, and in addition to general discussion in Part 2 which highlights the controversial nature of targeted strikes in general,

[798] See e.g., art. 1(2) API, *ibid*, n.43. This provides '[t]his protocol shall not apply to situations of internal disturbances, such as riots, isolated and sporadic acts of violence and other acts of a similar nature, as not being armed conflicts.
[799] Schmitt, *ibid*, n.747, 96.
[800] *Ibid,* 97.
[801] *Ibid.*
[802] *Ibid.*
[803] *Ibid.*

RULE 42
Commanders are prohibited from deploying AWS for the practice of extraterritorial targeted killings – other than when they operate within an operational and clearly defined battlefield.

4.2.8 The Lawfulness of Hunter-Killer Drones under International Human rights Law.

The following section considers the lawfulness of extraterritorial targeted killings under the legal discipline which is at the heart of Chapter Four's analysis - IHRL. Although the researcher has previously identified that IHRL is applicable in armed conflict (subject to the *lex specialis* of the *jus in bello*), this assessment has specific regard to situations where there is a lack of an operational, and clearly defined battlefield. Note that this analysis considers only the international implications of IHRL, and not the municipal implications of AWS deployments, such being extraneous to the thesis aims and purpose. [804]

This final Part 2 analysis therefore focuses on the lethal aspect of target strikes. In other words, the *extraterritorial* element is not considered in any great detail (that analysis having already taken place). With that in mind, the primary question addressed in the following section is, should targeted killings be considered arbitrary in nature. A primary objection to extraterritorial killings under IHRL, is that IHRL obliges a party to use the minimum amount of force that is necessary to ensure that a 'target' discontinues his or her unwanted action. In other words, IRHL has a capture rather than kill requirement, where it is possible.[805]

Some have suggested that this is the case under IHL,[806] however, that is simply not the case.[807] Scholars have, nevertheless, identified that Principle 9 of the UN Basic

[804] Having said that, the present researcher presumes that municipal law would nevertheless be drafted in accordance with all relevant IRHL obligations.
[805] Schmitt, i*bid*, n.747, 106
[806] ICRC DPH Guidance, *ibid*, n.558, 82. Also see, Jelena Pejic, 'Extraterritorial Targeting by Means of Armed Drones: Some legal implications' (2014) 96 INT'L REV RED CROSS, 1.
[807] See e.g., Michael N. Schmitt, 'The Interpretive Guidance on the Notion of Direct Participation in Hostilities: A Critical Analysis' (2010) 1 Harvard national Security Journal 5, 39–43. Also see, Schmitt, *ibid,* n.747, 105-110. Schmitt does point out that capture rather than kill does offer a number of tactical, and political advantages.

Principles on the Use of Force and Firearms by Law Enforcement Officials is a key obligation.[808] This states that,

> '[l]aw enforcement officials shall not use firearms against persons except in self-defence or defence of others against the imminent threat of death or serious injury, to prevent the perpetration of a particularly serious crime involving grave threat to life, to arrest a person presenting such a danger and resisting their authority, or to prevent his or her escape, and only when less extreme means are insufficient to achieve these objectives. In any event, intentional lethal use of firearms may only be made when strictly unavoidable in order to protect life'.[809]

When viewed in their entirety, the basic principles (on the Use of Force and Firearms by Law Enforcement Officials) are not considered to be legally binding.[810] However, the UN Special Rapporteur on extrajudicial, summary, or arbitrary executions, and other experts in the field, have noted that the 'substance' of principle 9 does reflect customary international law, meaning it does provide a binding obligation.[811]

Principle 9 is unambiguous in regard to its requirement of imminence, and the obligation to use fewer extreme measures where they can be used. As a result, outside of a recognised battlefield (e.g., outside of *Orenatle* territory) where IHRL is the sole applicable legal regime, extraterritorial killings, whether they are autonomous or not, are very likely to be considered unlawful. This is primarily because, drones and almost all other forms of hunter-killers considered, will by their very nature rarely allow for an adversary to be captured.[812] Therefore, the use of autonomous hunter-killer drones

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[808] Heyns *et al*, *ibid*, n.30, 819, and, Schmitt, *ibid,* n.747, 110.
[809]See, Basic Principles on the Use of Force and Firearms by Law Enforcement Officials (1990). < https://www.ohchr.org/en/professionalinterest/pages/useofforceandfirearms.aspx > accessed 10 July 2019.
[810] See, Resource book on the use of force and firearms in law enforcement, Office of the United States High Commissioner for Human Rights (2017, United states Office in Drugs and Crime), 7. https://www.unodc.org/documents/justice-and-prison-reform/17-03483_ebook.pdf accessed 11 May 2021.
[811] *Ibid.*
[812] Heyns *et al, ibid,* n.30, 817.

would breach the principle 9 requirement.[813] Insofar as IHRL is applicable, targeted killings would be considered arbitrary in nature, and in breach of Article 6 ICCPR (which considered in greater detail in the following section).[814]

With that in mind, however, the following is added,

RULE 43
Where an AWS is deployed to a location that is not an operational, and/ or clearly defined battlefield, lethal force must only be employed in situations where less extreme means are insufficient to achieve the mission objectives. In any event, intentional lethal force must only be used when strictly unavoidable in order to protect life.[815]

4.2.9 Extraterritorial Targeted Killings: In Sum.

Part 2 has considered two primary elements, extraterritorial targeted killings, and autonomous hunter-killer drones - the latter often being used, somewhat provocatively, by opponents trying to rally support for *the Prohibition*. To undertake the examination, it was necessary to revisit the *jus ad bellum* and the *jus in bello,* as well as looking to IHRL. The analysis demonstrated, unconditionally, that all three of these disciplines - individually and holistically - significantly impact upon how states may choose to deploy AWS to conduct said task. In the first instance, under the *jus ad bellum*, states must respect the sovereignty of neutral states, and gain consent it they wish to conduct

[813] See Schmitt, *ibid*, n.747, 110. Here Schmitt provide that in effect, the principles of necessity and proportionality come back into play. He notes that necessity requires 'that there be no alternative to the use of deadly force in protecting oneself or others from grave harm.' Nonetheless, the result is the same. For a useful analysis of the international law of law enforcement, see, https://www.geneva-academy.ch/joomlatools-files/docman-files/in-brief6_WEB.pdf accessed 3 February 2021. If a targeted attack was carried out, for example, by a ground force equipped with AWS, such an attack may adhere to IHRL obligations. For example, in a situation where a special forces operative deployed a L1 munition, such as a smart grenade, in order to prevent the escape of a person known to have authorised a particularly grave crime - and, where detaining the individual was not an option, this would be both a lawful use of force, and a lawful use of an AWS under IHRL.

[814] Note that certain issues may be raised in relation to the use of Private Military Contractors, and spies. For example, their Art. 6 ICCPR, *ibid,* n.602 right to life would, prima facie, outweigh a targeteers right to attack if the PMC or spy failed to reach the standard of either of combatant, or civilian directly participating in hostilities (DPH). For a useful discussion see, Grimal and Pollard (2020), *ibid*, n.4, part V. Here the authors also consider the concept of 'Robot Rights', and Robot Prisoners of War (PoW).

[815] Once again, this provision does not absolutely prohibit the use of hunter killer drones from employing a non-lethal force. However, this should not also be considered in isolation, but in respect of those such as Rule 39 (requiring consent).

operations there. In addition, under the *jus ad bellum* states must also not deploy AWS using pre-emptive self-defence as a legal basis.

Under the *jus in bello*, the use of hunter-killer drones could potentially be lawful upon an existing battlefield, but such uses would be severely restricted, not least by the principles of distinction and proportionality, and the rules relating to DPH. Finally, the use of hunter-killer drones would very likely be considered unlawful under IHRL, due largely to the fact that they will very rarely be capable of applying a less than lethal force to achieve their objective. As a result, contrary to the claims of those wishing to introduce a new treaty to ban AWS, existing legal obligations already provide the means for ensuring AWS cannot be routinely utilised for the task of extraterritorial killing.

Part 3 Autonomous Weapons Systems and The 'inherent' Right to life.

Part 1 identified that states must have full regard to *all* of their human rights obligations, at *all* times – both temporally and geographically. With that in mind, Part 3 examines the applicability of perhaps the most fundamental of all human rights,[816] the Article 6 ICCPR right to life.[817] This analysis considers how the combatant's privilege (the long-established right to injure and kill), can operate alongside the more recent Article 6 provision. The purpose of this analysis is primarily to demonstrate that opponents who argue that killing with an AWS is arbitrary, and thus in breach of Article 6, are wrong.

4.3.2 The Right to Life.

As previously, the doctrinal approach requires that the legal provision is first identified, before the more focused analysis can take place. Therefore, this section identifies the occasions within which IRHL identifies the 'inherent' right life. Once this has been

[816] See e.g., Christof Heyns and Thomas Probert, 'Securing the Right to Life: A cornerstone of the human rights system' (11 May 2016) EJIL Talk! (blog) < https://www.ejiltalk.org/securing-the-right-to-life-a-cornerstone-of-the-human-rights-system/> accessed 26 October 2020, and, Adil Ahmad Haque, Laws for War, in Jens David Ohlin (ed.), *Theoretical Boundaries of Armed Conflict and Human Rights*, *ibid*. n.742, 25.

[817] See e.g., art. 6 ICCPR, *ibid,* n.602, and art. 3 UDHR, *ibid,* n.727. As the previous section demonstrated the right to life is applicable at all times. However, see, Christof Heyns *et al, ibid*, n.30, 819. Here it provides, '[i]t is under IHRL that the right to life is most clearly protected, as set out in the various international and regional human rights treaties, and the rules of customary international law. The right to life is sometimes described as the "supreme right." Indeed, certain violations of the right to life are considered to be war crimes or crimes against humanity'.

established, the researcher can continue on to consider the matter of whether killing with the use of AWS should be considered arbitrary. In the first instance, Article 3 of the Universal Declaration of Human Rights (UDHR) (1948) states, '[e]veryone has the right to life, liberty and the security of the person'. Second, Article 6 (1) ICCPR supplies that, '[e]very human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life'.[818] The right to life, and the right not to be arbitrarily deprived of life, are customary obligations.[819] Thus, they are binding upon all states.[820]

In addition to international law, a number of other regional Human Rights instruments, also identify this provision. For example, Article 2(1) of the European Convention on Human Rights (ECHR), states, '[e]veryone's right to life shall be protected by law…'[821] A similar statement also appears in, the American Convention on Human Rights,[822] the African Charter on Human and Peoples' Rights,[823] the Inter-American Convention on the Prevention, Punishment and Eradication of Violence against

[818] Art. 6(1) ICCPR, *ibid,* n.602 . Art. 6 goes on to state: '(2) In countries which have not abolished the death penalty, sentence of death may be imposed only for the most serious crimes in accordance with the law in force at the time of the commission of the crime and not contrary to the provisions of the present Covenant and to the Convention on the Prevention and Punishment of the Crime of Genocide. This penalty can only be carried out pursuant to a final judgement rendered by a competent court. (3) When deprivation of life constitutes the crime of genocide, it is understood that nothing in this article shall authorize any State Party to the present Covenant to derogate in any way from any obligation assumed under the provisions of the Convention on the Prevention and Punishment of the Crime of Genocide. (4) Anyone sentenced to death shall have the right to seek pardon or commutation of the sentence. Amnesty, pardon or commutation of the sentence of death may be granted in all cases. (5) Sentence of death shall not be imposed for crimes committed by persons below eighteen years of age and shall not be carried out on pregnant women. (6) Nothing in this article shall be invoked to delay or to prevent the abolition of capital punishment by any State Party to the present Covenant.'

[819] See e.g., The [U.K.] Government's policy on the use of drones for targeted killing, which states: 'the rule against the arbitrary deprivation of life is a rule of customary international law.' (Parliament) < https://publications.parliament.uk/pa/jt201516/jtselect/jtrights/574/57416.htm> accessed 11 July 2021, and, Heyns and Probert, *ibid*, n.816, stating: '[t]he right to life is a well-established and developed part of international law, in treaties, custom, and general principles, and, in its core elements, in the rules of jus cogens.'

[820] Note that the UDHR, *ibid,* n.727 being a declaration, is not a treaty and therefore not strictly a binding document.

[821] Art. 2(1) European Convention for the Protection of Human Rights and Fundamental Freedoms, (as amended by Protocols Nos. 11 and 14 ETS 5 (1950). (hereinafter ECHR).

[822] Art. 4(1) of the American Convention on Human Rights states, 'Every person has the right to have his life respected. This right shall be protected by law and, in general, from the moment of conception. No one shall be arbitrarily deprived of his life'. See also, Art. 1 of the American Declaration of the Rights and Duties of Man stating, 'Every human being has the right to life, liberty and the security of his person'.

[823] Art. 4 African Charter on Human and Peoples' Rights (Banjul Charter) CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), states, 'Human beings are inviolable. Every human being shall be entitled to respect for his life and the integrity of his person. No one may be arbitrarily deprived of this right.' See also, Art. 4 Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa, and Art. 5 of the African Charter on the Rights and Welfare of the Child.

Women/ 'Convention of Belém do Pará',[824] the African Charter on Human and Peoples' Rights on the Rights of Women in Africa, the African Charter on the Rights and Welfare of the Child, and, the Arab Charter on Human Rights.[825]

A question that goes to the heart of this chapter is that if IHL, and IHRL, are to be given equal regard during armed conflict, how can states conduct warfare while remaining compliant with their IHRL obligations? This matter has been considered by the ICJ in providing both the *Nuclear Weapons Advisory Opinion*,[826] and *the Wall Advisory Opinion*.[827] And the answer, quite simply, is that IHRL does not provide absolute obligations. This is generally due to the previously identified concept of *lex specialis.* Noting that 'both spheres of law are complementary, not mutually exclusive',[828] and that IHL does not replace IHRL. [829]

To provide an example of how this balance operates, consider the following, if an individual is killed in breach of an IHL norm, such as distinction, a state may be found to have breached both IHL, and IHRL – if, by failing to distinguish, the killing was considered arbitrary (though this would clearly need to be assessed on a case-by-case basis). The concept of *lex specialis*, however, ensures that so long as a belligerent adheres to IHL norms, they will not breach an IHRL norm such as Article 6 ICCPR.[830] The point is simply that where a belligerent takes a human life lawfully under IHL, the killing is not considered arbitrary.[831]

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[824] Art. 4 of the Inter-American Convention on the Prevention, Punishment and Eradication of Violence against Women/ 'Convention of Belém do Pará' states, 'Every woman has the right to the recognition, enjoyment, exercise and protection of all human rights and freedoms embodied in regional and international human rights instruments. These rights include, among others: (a). The right to have her life respected…'

[825] Art. 5 Arab Charter on Human Rights provides, 'Every individual has the right to life, liberty and security of person. These rights shall be protected by law.'

[826] *Nuclear Weapons Advisory Opinion, ibid,* n.73.

[827] *The Wall Advisory Opinion, ibid.* n.737.

[828] HRC, General Comment 36 on the right to life (2018), para. 64 (hereinafter HRC GC36). This superseded previous general comments (e.g., General Comment 6 (1982) (hereinafter GC6), and General Comment 14 (1984) (hereinafter GC14).

[829] In *Nuclear Weapons Advisory Opinion, ibid*, n.73, para. 25 the ICJ state: 'In principle, the right not arbitrarily to be deprived of one's life applies also in hostilities. The test of what is an arbitrary deprivation of life, however, then falls to be determined by the applicable *lex specialis*, namely, the law applicable in armed conflict which is designed to regulate the conduct of hostilities…'

[830] Hereinafter the right to life contained within art 6(1) ICCPR, *ibid*, n.602 is the primary focus, not least due to the fact that the treaty is the most comprehensive and inclusive of all the international human rights treaties.

[831] See e.g., HRC GC36, *ibid,* n.828, para. 67. As an additional, and perhaps somewhat interesting note, although in contemporary armed conflict in particular a state may find itself in opposition to a Non-State Armed Group (NSAG), a NSAG cannot be held accountable under either IHL, or IHRL. In other words,

4.3.3. Is Killing With the Use of an Autonomous Weapons Systems Arbitrary?

One of the most fundamental questions being considered by experts, is whether it is should be acceptable for an AWS to decide who lives and who dies?[832] Commentators such as Professor Christof Heyns questions, for example, 'whether the rights to bodily integrity do not require whatever force is used against a human being to be authored by a human being as opposed to a robot.' [833] Somewhat significantly for present purposes, he continues, 'is it not inherently arbitrary for a machine to take decisions about life and death over human beings?'[834]

If so, then the customary IHRL right not to be arbitrarily deprived of one's life could, at the very least, restrict the use of AWS to those which would receive a *Template* classification on the non-lethal axis, AWS [N]. Indeed, as demonstrated, the temporal and geographical applications of IHRL means that IRHL norms are applicable at all times - whether AWS were deployed upon sovereign territory, or extraterritorially. As has been a constant point of reference throughout this body of work, this is key to those supporting *the prohibition*, because in the majority of cases, they only appear to support a ban upon 'lethal' autonomous weapon systems (LAWS).

Acting in his (previously held) role as UN Special Rapporteur, Heyns compiled a report on AWS. [835] He presented his findings to the UN General Assembly.[836] In it he cites a number of reasons why states should remain cautious when considering the use

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a NSAG may be capable of conducting military operations, including with the use of AWS, with little recourse to international legal authorities. It should also be noted that should a NSAG behave in such a manner, they leave themselves open to being lawfully attacked by a state acting in self defence. See e.g., Schmitt, *ibid*, n.747, 109. Here the author provides: '[i]f an armed conflict is not underway, international human rights norms and domestic law apply in lieu of international humanitarian law. This is so even in the case of self-defense, although most defensive acts, combined with the armed attack to which they respond, will comprise either an international or non-international armed conflict.'

[832] For some, AWS bring something new to the fore, something that the ICJ could not have imagined when providing their advisory opinion. See generally e.g., Sparrow, *ibid,* n.579. He identifies AWS as *mala in se,* or inherently evil, and at pp95, when distinguishing AWS from existing weapons such as the PHALANX, as something not yet seen in warfare. The suggestion is that there are certain, intrinsically human principles, which naturally rank higher than any international legal norms, and which demonstrate that it is simply wrong, or unjust, to take a human life with the use of an AWS. Note that this matter, and the ethical implications of AWS generally are considered in the flowing chapter.

[833] Heyns, *ibid,* n.763, 366.

[834] *Ibid.*

[835] Heyns refers to AWS as Lethal Autonomous Robots (LARS), which as previously noted is an alternative acronym for AWS. Note that the term LARS is used largely in reference to embodied artificial intelligence (EAI), rather than being a term that is also inclusive of autonomous cyber weapons.

[836] Heyns, *ibid*, n.180.

of AWS. One element of the report that is particularly relevant to the current discussion, is that Heyns believes,

> '[d]ecisions over life and death in armed conflict may require compassion and intuition. Humans – while they are fallible – at least might possess these qualities, whereas robots definitely do not.'[837]

This statement is made in reference to the Martens Clause, which is considered in greater detail in the following chapter. As a result, there is not a pressing need to invoke a comprehensive discussion here. [838] However, referencing, *inter alia*, the work of Professor Peter Asaro,[839] Heyns notes that the Clause contains an implicit requirement for humankind to be involved in any decision regarding the application of force. [840] He argues, for example, that for any non-human decision to do so, would be inherently arbitrary, and therefore unlawful under IHRL. [841] Consequently, according to the Special Rapporteur, a moratorium should be placed upon the development and use of AWS at the international level,[842] while individual states should also be encouraged to do the same at the at the municipal level.[843]

4.3.4 Why the Arbitrary Killing Argument Fails.

One way in which Heyns' argument is weakened, is that it relies upon a concept (the Martens Clause) that's legally binding nature is far from established. Arguably, in certain instances, it can obligate a state to consider the wider ethical considerations of warfighting. And, as is considered in greater detail in following chapter, the ethical case against AWS may be a valid one and may yet provide the impetus that ultimately leads to the creation of a prohibitive treaty.

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[837] *Ibid,* para. 55.
[838] See, *Nuclear Weapons Advisory Opinion*, *ibid*, n.73, para. 78. Here the court provides '...the Martens Clause…was first included in the Hague Convention II with Respect to the Laws and Customs of War on Land of 1899 and which has proved to be an effective means of addressing the rapid evolution of military technology.' Arguably, however, it is principally an ethical clause that is to be considered where there appears to be no existing provision in international law.
[839]Asaro, *ibid,* n.317, 687.
[840] Heyns, *ibid*, n.180, para. 90, and Asaro, *ibid,* n.317, 699.
[841] Heyns, *ibid*.
[842] *Ibid*, paras. 113 -114.
[843] *Ibid*, para. 118.

However, the proposition that the 'principles of humanity', and the 'dictates of public conscience' make autonomous killing arbitrary is unconvincing for two primary reasons. Compressively summarising the first of these an opponent to Heyns provides,

> '[g]eneral revulsion in the face of a particular conduct during hostilities (even if it goes beyond habitual functions of public opinion) does not create 'an independent legal criterion for weaponry' or methods of warfare.'[844]

The ICJ has identified that a modern version of the clause is contained within Article 1(2) API.[845] As a result, it is a principle that policy makers, strategists, scholars, lawyers, and commanders alike need to consider when assessing the impact of a new weapons technology. Nevertheless, the fact that the UN has established a Group of Governmental Experts (GGE) made up of such figures, and who to have met regularly to discuss the implications of the use of the use of AWS in armed conflict, means that considerable attention is most certainly being given to the provision.

The point is, however, that positing the Martens Clause, (or Article 1(2) API) as an independent provision that has the ability to render a particular killing arbitrary, and consequently prohibit a weapons system that has been proven to be capable of operating lawfully in all other in circumstances is stretching the interpretation too far. Indeed, Heyns' position does little for legal certainty, relying far too heavily upon subjective opinions and conceptual elucidations.

A second, and perhaps more pertinent, reason as to why the Heyns / Asaro proposition is unconvincing, is due to the fact that the modern version of the clause, - Article 1(2) API - is only applicable '[i]n cases not covered by this Protocol or by other international agreements'.[846] However, 'today a rich fabric of treaty law governs the legality of

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[844] Dinstein, *ibid*, n.244, para. 38. In turn, Dinstein cites, P.A. Roblee, 'The Legitimacy of Modern Conventional Weaponry' (1976), 71 Mil. LR 95, 125. It is perhaps significant that here the author is not referring specifically to AWS, but to all new, or novel weapons systems that happen to come under analysis.

[845] *Nuclear Weapons Advisory Opinion*, *ibid*, n.73, para. 78. Also see, art. 1(2) API, *ibid,* n.43. This provides: '[i]n 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.'

[846] Art 1(2) API, *ibid*, n.43.

weapon systems'.[847] Many of these treaties – which for example prohibit certain munitions – will have a significant effect on the development and deployment of AWS.[848] Moreover, as the previous two chapters have shown, AWS deployments are already well regulated by the principles of the *jus ad bellum*, and the *jus in bello*.[849]

As a result, it approaches a folly to suggest that although AWS can operate in adherence with this vast body of established international legal principles, that they should nevertheless be prohibited. [850] This is perhaps especially true when the method used to support *the prohibition* is a clause which is only intended to apply in instances where there is a lacuna, or lack of existing legal framework.

This is not merely a scholarly position, but one which has been stated to by the international judiciary. For example, in providing their *Nuclear Weapons Advisory Opinion*, the ICJ provided that

> '…whether a particular loss of life, through the use of a certain weapon in warfare, is to be considered an arbitrary deprivation of life contrary to Article 6 of the Covenant, can only be decided by reference to the law applicable in armed conflict and not deduced from the terms of the Covenant itself.'[851]

Of course, Article 1(2) API is one provision of IHL to which the court was referring. Nevertheless, for reasons already established (and considered in Chapter Five), the Martens Clause is an insufficient apparatus to be used in isolation to support *the prohibition*. Moreover, the thesis examination has, thus far, found no single reason to identify that AWS are wholistically, inherently unlawful, or that their use is any more arbitrary a than killing with nuclear weapons, or with targeted missile strikes authorised by a human. Indeed, this is not only consistent with the ICJ, but also with the Human Right Commission who have, somewhat notably, stated that,

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[847] Schmitt, *ibid,* n.42, 32.
[848] *Ibid.*
[849] *Ibid.*
[850] *Ibid.*
[851] *Nuclear Weapons Advisory Opinion, ibid, n.73,* para. 25.

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The 'use of lethal force consistent with international humanitarian law and other applicable international law norms is, in general, not arbitrary.' [852]

4.3.5 The Right to Life: In Sum.

Part 3 has considered AWS alongside the fundamental IHRL right to life. As a result, the discussion was grounded within the lethal axis. The analysis identified the potential conflict between the right to life right, and the combatant's privilege. However, the *lex specialis* of IHL ensures that the right to life is not breached when a live is not taken arbitrarily.[853] Some have argued that IHRL requires a human must always take the decision to kill another human. And, that if this 'condition' is removed – all lethal force would be arbitrary. However, this view runs counter to that of both the ICJ and the HRC, who have both shown support for the rule that where lethal force is applied in a manner that is consistent with IHL, killing will not be considered arbitrary. Thus, the right to life is not breached by an AWS operating on a battlefield, in accordance with IHL, and the general principles identified herein by the present researcher.

Part 4. Additional Ways in Which Autonomous Weapons Systems Could Breach International Human Rights Law.

Thus far, Chapter Four has considered the applicability of IHRL in armed conflict, specific AWS deployments under IHRL, and AWS deployments according to a specific IHRL norm. As in previous chapters, the following section introduces any remaining provisions which are contained within the wider body of law that is under investigation, and which might affect AWS deployments. The norms which are, therefore, analysed in Part 4 are, Article 7 ICCPR prohibition of cruel, inhumane or degrading treatment of punishment, the Article 9 ICCPR right to liberty and security of the person, and the

[852] GC36, *ibid,* n.828, para. 64. Also see, GC36, para. 67 which states that in contrast '…practices inconsistent with international humanitarian law, entailing a risk to the lives of civilians and other persons protected by international humanitarian law, including the targeting of civilians, civilian objects and objects indispensable to the survival of the civilian population, indiscriminate attacks, failure to apply the principles of precaution and proportionality, and the use of human shields, would…violate article 6 of the Covenant [ICCPR].'

[853] Of course, an AWS could potentially behave in such a way that led to an arbitrary killing - if it malfunctioned and intentionally targeted civilians for instance. However, killing with AWS cannot be considered arbitrary *per se*.

Article 14 ICCPR right to due process. In each instance the obligation is identified. This is then considered in light of the continuing introduction of increasing advanced AWS. As has been the case throughout, this final analysis is not necessarily used to conduct an in-depth investigation, but rather to identify and dismiss any potential wider arguments.

4.4.2 Autonomous Weapons Systems and Article 7 ICCPR.

The first additional IHRL obligation that may affect the lawfulness of AWS deployments relates to the treatment of targets and civilians in locations where AWS operate. Article 7 ICCPR is of particular regard. This states, for example, that,

> 'no one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment. In particular, no one shall be subjected without his free consent to medical or scientific experimentation.'[854]

Some concerns have been raised about AWS in regard of Article 7 ICCPR. Though noting that until such time that AWS are capable of exhibiting something similar to human consciousness, where they 'are not deployed with an *intent* to inflict pain' they cannot be capable of torture.[855] It is however argued, that weapons may nevertheless be capable of breaching the prohibition of cruel, inhumane or degrading treatment or punishment (CIDP). This is not least, because there is a 'lower intensity threshold' for this than there is for torture.[856] Both prohibition on torture, and on CIDP, have *jus cogens* status, and thus cannot be derogated from.[857] This appears to be consistent with Article 4(2) ICCPR, which as previously noted, also prohibits derogation from Article 7.[858]

States deploying AWS are bound by these prohibitions both when operating in armed conflict and, indeed at all times. Therefore, there remains the possibility that in certain circumstances, civilians, and perhaps the family members of targeted individuals such

[854] Art. 7 ICCPR, *ibid*, n. 602.
[855] Laufer, *ibid,* n.737, 72.
[856] *Ibid,* citing the European Court of Human Rights, Ireland v United Kingdom App No 5310/71 (ECtHR, 18 January 1978), para. 162.
[857] Laufer, *ibid,* n.737, 72.
[858] Regarding derogation see, *ibid,* n.728.

as those considered in Pat II might have their Article 7 ICCPR rights breached.[859] Primarily, this is because where drones are used to target and kill certain individuals, family members witnessing the killings can often be subjected to severe physical or mental suffering.[860] Lauffer suggests that that in some villages, where 15-20 drones per day are sighted, 'communities live in terror which has taken "a psychological toll" on them'.[861]

Nevertheless, as convincing as these arguments initially appear, and regardless of the fact that her discussion regards *drones and killer robots*, Lauffer's focus is rather squarely placed upon the former. As a result, not only is the opportunity to discuss killer robots missed, but the analysis does not extend beyond extraterritorial targeted killings, which for the sake of the Chapter Four analysis, has already been undertaken in Part 2.

Her efforts to encourage the ICRC to pay closer attention to IHRL with regards to new weapons assessments should be applauded. But her analysis does not introduce anything new to the discussion, and certainly not anything specific to the use of AWS arising under IHRL.[862] Therefore, as has been demonstrated on a number of occasions, this line of discussion merely considers the lawfulness of a use of any weapon (autonomous or not), as opposed to the lawfulness of an AWS. While the present researcher is sympathetic to the view that the Article 7 obligation must be respected regardless of whether a specific act occurs in armed conflict or outside of it, the obligation does not in any way provide specific support those wishing to prohibit AWS.

4.4.3 Autonomous Weapons Systems and Article 9 ICCPR.

The previous section identified that while article 7 ICCPR does provide an obligation that could impact upon how weapons are to be deployed, it is not a provision that impacts upon AWS only. The following section examines whether the same is true of

[859] Laufer, *ibid,* n.737, 73.
[860] *Ibid.*
[861] *Ibid.*
[862] *Ibid.* Here Laufer states, '[d]rones cause severe pain and lasting psychological trauma. This harsh reality may tempt one to contend that drones are inherently unlawful and should therefore never be used. However, as mentioned above, in theory, it is possible to use drones in a 'clean' manner, where, despite the killing of the targeted fighter, no physical or mental harm is caused. Therefore, the fact that CIDT was caused in *most situations* (emphasis added) when drones have been employed in the past does not automatically render drones inherently unlawful. Thus, drones will result in CIDT only in circumstances where their use causes severe physical or mental suffering.'

an additional IHRL provision – Article 9 ICCPR. In the first instance, it should be noted that unlike those previously considered, the ICCPR *does* allow for there to be derogation from Article 9. This is only in 'time of public emergency which threatens the life of the nation and the existence of which is officially proclaimed'.[863]

Though this would likely include periods where a State was participating in armed conflict. Nonetheless, Article 9 (1) ICCPR provides that,

> '[e]veryone has the right to liberty and security of the person. No one shall be subjected to arbitrary arrest or detention. No one shall be deprived of his liberty except on such grounds and in accordance with such procedures as are established by law.'

Offering a similar argument to Laufer's in the previous analysis, Hattan proffers 'if civilians are persistently policed by LARs and fear an imminent attack, then they may feel forced to go outside sparingly or only during certain times of day'.[864] The author adds, if that was the case, a civilian's right to security of the person must be violated.[865] He does note that there is a potential for such concerns may be somewhat overstated.[866]

In his wide-ranging assessment, Hattan acknowledges (in line with the present thesis hypothesis) that many of the arguments in opposition to AWS are mistaken because in many situations, the use of AWS may be warranted and lawful. As a result, he argues, however valid certain arguments may first appear, they do always provide support those looking to prohibit AWS.[867] Hattan believes that states should use the introduction of AWS 'an opportunity to re-examine (*sic*) current practice',[868] which arguably, the present researcher has done.

The primary point of note here, is not that a comprehensive analysis has already been conducted, but that the Article 9 discussion is applicable to all weapon deployments, and specifically armed UAVs. Only the *Template* is capable of distinguishing hunter-

[863] Art. 4 ICCPR, *ibid,* n.602.
[864] Titus Hattan, 'Lethal Autonomous Robots: Are They Legal under International Human Rights and Humanitarian Law?', (2015) 93 NEB. L. REV. 1035, 1055.
[865] *Ibid.*
[866] *Ibid.*
[867] *Ibid,* 1056.
[868] *Ibid.*

killer drones from AWS such as munitions, which, if they were ever developed would arguably be welcomed by the international community. Nevertheless, Article 9 ICCPR cannot be utilised as an independent mechanism for supporting the *Prohibition*.

4.4.4 Autonomous Weapons Systems and Article 14 ICCPR.

The third and final additional IHRL provision that is considered in this chapter is Article 14 ICCPR. The obligation that is contained within it is referred to as the right to due process. This is relevant to IRHL generally, and so to the Article 14 obligation, the right to life identified in Article 6 ICCPR. [869] Moreover, Article 6 can be further linked to Art. 9 ICCPR, primarily because the right to due process provides that '[e]veryone charged with a criminal offence shall have the right to be presumed innocent until proved guilty according to the law.'[870] Perhaps the most influential paragraph in Article 14, however, provides,

> '[i]n the determination of any criminal charge against him, everyone shall be entitled to the following minimum guarantees, in full equality: (a) to be informed promptly and in detail in a language which he understands of the nature of the cause of the charge against him, (b) to have adequate time and facilities for the preparation of his defence and to communicate with counsel of his choosing, (c) to be tried without due delay, (d)to be tried in his presence…(e) to examine, or have examined, the witnesses against him…'[871]

With that in mind, it is clear that there is a requirement - in the absence of an armed conflict - for individual to be afforded the right to due process. Once again, outside of armed conflict, where an individual who is suspected of crime is not provided with access to such provisions, a state would breach the Art. 9 ICCPR not to be subjected to arbitrary arrest or detention. The obligation is clear. And it does of course, apply to an that AWS used for the purposes of targeted killings. Moreover, outside of a battlefield,

[869] *Ibid*, 1053.
[870] Art. 14(2) ICCPR, *ibid,* n.602.
[871] Art. 14(3) ICCPR, *ibid,* n.602.

if an individual was targeted and killed instead of being arrested, it would also be an arbitrary deprivation of life in breach of Art. 6 ICCPR.

Once again however, this does not add a great deal to the discussion as to whether AWS are inherently unlawful under IHRL. Instead, it merely supports the present researchers hypothesis, that the arguments used in opposition to AWS, are opposed to robotic warfare generally. Therefore, even where AWS can be specifically regarded, the problem is with their use, and not with the weapons *per se*. Although the Article 14 obligation will prevent the use of AWS in some circumstances, it does not prohibit them altogether.

4.4.5 Additional Ways in Which Autonomous Weapons Systems Could Breach International Human Rights Law: In Sum.

Part 4 has had considered three final IHRL provisions which are undoubtably relevant to AWS deployments. The three provisions examined were Article 7 ICCPR, Article 9ICCPR and Article 14 ICCPR. In each instance the obligation was identified, before it was then, albeit briefly, considered in light of the continuing introduction of increasingly advanced AWS. Each analysis showed that the obligations contained within these Articles will impact upon how an individual responsible for authorising the use of AWS, [872] could choose to deploy them. For example, Article 7 ICCPR obliges those responsible for authorising the use of AWS to consider the psychological toll that AWS (and particularly the use of Hunter-Killer drones), will have upon the civilian population. Similarly, Article 9 ICCPR provides a protection to civilian populations by identifying the right to the security of the person. Finally, Article 14 can be used in order to support the claim that autonomous targeted killings would be arbitrary in nature, and thus in breach, inter alia, of Article 6 ICCPR.

Nevertheless, none of the three provisions considered bring anything new to the debate. This is because none of the arguments used to support the prohibition can be applied only to AWS, even where they are deployed to environs outside of a battlefield. As a result, and regardless of the fact that it is potentially possible to identify a number of thesis rules, this task was not undertaken. The reason is because

[872] Here the author imagines the addition of individuals such as the directors of clandestine state security services.

such rules are would always be surpassed, or else made irrelevant by RULE 42 which prohibits the use of AWS for the purpose of extraterritorial targeted killings (except where they are deployed upon a clearly defined battlefield).

4.4.6 Chapter Four Conclusion.

This chapter has reflected upon the third international legal discipline that is applicable to AWS deployments - IHRL. At the heart of this investigation was the realisation that IHRL norms must be applied at all times – including where and when states (and their representatives) operate on the battlefield. As was identified in the previous chapter, IHL is the body of law which has evolved with the specific task of govern the actions of belligerents in armed conflict. Consequently, where it appears certain legal provisions are at odds, the *lex specialis derogat legi generali* of IHL must prevail over the *lex generalis* of IHRL.

Part 2 applied a somewhat unusual analysis, in that it considered a specific type of weapon – namely, hunter-killer drones. Here, in contrast to those who proffer such weapons are on the horizon, the researcher identified a number of ways in which the whole corpus of international law significantly restricts such AWS deployments. Part 3 had reference primarily to the Art 6 ICCPR right to life. It demonstrated that in contrast to calls, inter alia, from UN special Rapporteurs, the use of AWS to kill cannot be considered arbitrary where it is considered lawful under IHL. Finally, Part 4 conducted a brief assessment of AWS in light of three more relevant IHRL obligations. But, while they could potentially offer a number of methods for restricting AWS further, they would be both relevant to weapons generally, and not just AWS. Moreover, given that all three discussions related directly to the Part 2 analysis, any potential rule would be superseded by that prohibiting the use of AWS for extraterritorial targeted strikes. Significantly, in much the same way as the previous two chapters, the preceding IHRL examination supports the current authors hypothesis that calls for an absolute prohibition on legal grounds are unjustified. Rather, it is regulation that is turgently required.

CHAPTER FIVE. AUTONOMOUS WEAPONS SYSTEMS, THEORY AND ETHICS.

Chapter Introduction.

The preceding three chapters have each considered Autonomous Weapons Systems (AWS) deployments according to codified and customary legal norms. This chapter is different. Instead of identifying positive law obligations, it assesses AWS deployments alongside theory and ethics. Of the four primary analyses contained within this chapter, however, three can linked back to the legal disciplines previous discussed. The focus of Part 1 of this chapter is *just war theory* which has been inescapably entwined with the *jus ad bellum* for over 1500 years. [873] Part 2 (which, considers the ethical clauses that are contained within international treaties) is particularly relevant the *jus in bello*. [874] Part 3 introduces a concept considered by many to be a fundamental International Human Rights Law (IHRL) Principle. While Part 4 examines the independent matter as to whether AWS should be prohibited by way of a new international treaty because they are *mala in se*,[875] that is - evil in themselves.[876] As in

[873] The *jus ad bellum* is firmly grounded in the centuries old just war theory (*JWT*). Saint Augustine of Hippo (354-430 C.E.) is largely credited as being the architect of the theory. Though it is Saint Thomas Aquinas (1125-1274 C.E.) who is believed to have introduced the individual conditions some 900 years later. It should be noted that this was still long before the introduction of the international treaties that currently regulate the use of force in armed conflict. For further discussion see e.g., Chinkin and Kaldor, *ibid,* n.378, 131.

[874] As the following investigation will determine, the status, and precise nature of the Martens clause is far from settled. Some do argue that the Martens Clause is an IHL treaty obligation. However, as noted by Dinstein, the principles of humanity and the dictates of public conscious, the two concepts that are at the core of the Martens clause, cannot themselves be considered as additional strata of the law. See, Dinstein, , n.244, para. 38.

[875] Yoo, *ibid,* n.679, 469. The point here is that on the one hand certain scholars proffer that AWS violate the requirement to respect the humanity of our enemies. See e.g., Sparrow, *ibid,* n.579, 93 and 110. Also see e.g., Schmitt, *ibid*, n.42, 6, and generally, Sassoli, *ibid*, n.39. The author wishes to indicate that they subscribe to the view that the primary difference between ethics and morals is that the prior is generally intended to refer to a *code of conduct* which has been provided by an external source, while the latter to an individual's own perception of what he or she perceives as right and/ or wrong. However, as it does in the literature regarding AWS, the terms are often used interchangeably. Therefore, except where explicitly stated, this chapter generally refers to morals and ethics as a single, common sociological standard. When considering this common standard, however, it is vital to remain aware of the potential differences in cultural interpretations. This is perhaps one reason why an examination of JWT alone is an insufficient means for determining the ethical implications of AWS, given that the philosophers, theologians, policy-makers, military leaders, and ethicists who have debated its merits over a number of centuries hail predominantly from occidental heritage.

[876] See e.g., Osbourn's Concise Legal Dictionary, Mick Woodly *ed.* (12th edn. 2013, Sweet and Maxwell), 269. Here it states, '*Mala in se* acts which are wrong in themselves, such as murder, as opposed to *mala prohibita*, acts which are merely prohibited by law, e.g., smuggling.'

previous chapters, the Chapter Five analysis is grounded in the classifications of AWS identified upon the *Template*.

PART 1. Autonomous Weapons Systems and Just War Theory.

The single most applicable theory to help identify whether the conduct of military operations is morally acceptable is *JWT*.[877] As a result, *JWT* implicitly provides one of the most suitable bases for conducting an assessment as to whether or not there are certain moral and ethical implications that should prevent AWS deployments. As previously noted, *JWT* is irrevocably intertwined with the *jus ad bellum*.[878] Thus, there will inevitably some potential overlap with Chapter Two. In order to prevent repetition, the researcher chooses not to repeat previous analyses, but rather, direct the reader to the appropriate section.

JWT originates from the theologians of the middle ages.[879] It has, therefore, existed for centuries, and is still the predominant form of assessing or legitimatising a recourse to force from an ethical perspective.[880] It manifests itself by way of six interconnected principles.[881] And, each of these must be satisfied in order for a war to be considered just.[882] Given that *JWT* principles are still widely reflected upon today by those

[877] As will be demonstrated in the following analysis, JWT is the primary method that is used to help determine whether a recourse to the use of force should be considered morally acceptable. However, it should be noted that although philosophers, theologians, policy-makers, military leaders, and ethicists have all deliberated upon the theory for theory for centuries, there is some, perhaps justified, suggestion, that it offers only a partisan westernized formula. See e.g., Dinsten, *ibid*, n254, 68-70, and Chinkin and Caldor, *ibid*, n.378, 132.

[878] Though in some instances, it appears that the terms *jus ad bellum*, and JWT are used interchangeably, see e.g., Heather Roff, proportionality, this should not be the case. This is, not least, because JWT not only considers the *jus ad bellum*, but the *jus in bello*, and increasingly the *jus post bellum* (or the justice after war). See, Michael Newton & Larry May, *Proportionality in International Laws,* (Oxford University Press, 2014), 61-84. While the Jus and bellum and the *jus in bello* are the focus of Chapters Two and Three respectively, this thesis does not intend to examine the *jus post bellum* implications of AWS, as it would have little bearing upon the present analysis.

[879] David Luban, 'Human Rights Thinking and the Laws of War' in Jens David Ohlin (ed.) *Theoretical boundaries of Armed Conflict and Human Rights,* 69.

[880] JWT is largely grounded in Christian philosophy regarding natural law, and ultimately it attempts to address the postulation that though war is often destructive, it is not always the most damaging option. In other words, if one is able to demonstrate that a war is for the greater good, it will be considered a just war.

[881] These are each considered in greater detail *infra*. However, note that *JWT* is grounded in the natural law. Ultimately, it attempts to address the postulation that though war is often destructive, it is not always the most damaging option. In other words, if one is able to demonstrate that a war is for the greater good, it may be considered a *just* war.

[882] Some question whether *correct intentions* should be seen as an independent criterion, and consequently argue that there should be only 5 criteria. See e.g., Chinkin & Caldor, *ibid,* n.378, 132. This proposition is explored in greater detail below.

considering the lawfulness of the decision to wage war, they will almost certainly be used to the evaluate AWS deployments. In fact, although programming matters are beyond the scope of the present thesis, *JWT* may be extremely useful with regards to design the code which will be uploaded to AWS.

The six *JWT* principles that will determine this are, a state must ensure (i) they have *just cause* for going to war, (ii) they do so with *appropriate intentions*, (iii) war is a *last resort*, (iv) war is *declared and authorised by the appropriate authority*, (v) there is a *reasonable probability of success*, and (vi) the overall cost of war is *proportionate* to the benefit obtained from going to war. The remainder of Part 1 examines each of these six principles, in turn, and in order to establish whether an autonomous application of force should be considered a *just* (vis-à-vis morally acceptable) use of force.

5.1.2 A State Must Have a Just Cause for Going to War.

This section considers the first of the six *JWT* principles examined in Part 1, which requires that a state must have *just cause* for going to war. It is widely accepted that each of the six *JWT* criteria are equal in stature an applicability, though it might be said that there is a *sense* that *just cause* has priority.[883] In the days of Thomas Aquinas, the punishment of a *wrongdoing*, and/ or the positive spreading of Christianity were considered *just causes* for going to war.[884] However, for reasons which do not require further elucidation, these are no longer seen as such.

Instead, the only just causes are those which are identified by UN Charter (and which were considered in Chapter Two). [885] Therefore, the only *just* resorts to force are individual or collective self-defence, and UNSC authorisations. As previously noted, where force is employed, and it is not in furtherance of either one of these two

[883] Jeff McMahan, 'Just Cause for War' (2005) 19 3, Ethics & International Affairs 1, 5. Here the author, a leading just war theorist, forwards that a reason for just cause having priority over the other principles of *jus ad bellum*, is because none of the other five could be satisfied, should the cause not be considered just. Also see, Newton & May, *ibid,* n.878, at 63.
[884] McMahan, *ibid,* 1.
[885] In other words, according to the concept of just cause, a State may only resort to war in self-defence of a threatened or actual armed attack, against itself or another. See, Richard J. Regan, Just War: Principle and Cases (Catholic University of America Press, 1996),48. Here the scholar notes, 'waging war should be to prevent or rectify wrongful, that is unjust, action by another nation'. Though the author continues 'not every wrong suffered at the hands of another nation will proportionally justify the injured nation's waging war'. This clearly supports the discussion that notes that the just war principles of just cause, and just war theory proportionality are inextricably linked.

exceptions, it is considered an act of aggression. By *JWT* standards, where an act does not conform to one of those two exceptions identified, it is an unjust use force. Clearly, because all six principles must be satisfied, a war without *just cause* is an *unjust* war.

5.1.2.2 Autonomous Weapons Systems and the Concept of Just Cause.

The matter of deploying AWS for the purposes of self-defence and humanitarian intervention was considered in Chapter Two (2.3) As a result, there is no need to reconsider the entirety of that analysis here. The most significant factor to recall is that the Chapter Two analysis demonstrated that the use of AWS is wholeheartedly compatible with either of the two *just causes* identified.

Potentially, one could posit the argument that an AWS could not distinguish between *just* and *unjust* causes – particularly those which operated at some distance (temporally and geographically) from the commander's initial authorisation. Arguably, they would either react to certain pre-defined criteria, or they would not. Nevertheless, the point is moot, because the nature of establishing the *just cause* is so clearly aligned with its lawfulness. A post act assessment will not have regard as to whether the state, or its agent, had prior knowledge of there being a *just cause*, but only whether one can be established.

With regard to *Template* classifications, Chapter Two identified that L1AWS are generally compatible with the two *just causes*. They will either be authorised by a human operative (who could potentially assess whether there was a *just cause*), or, by a L2AWS – noting that in most instances, the latter will also need to be authorised by a human operative. The previous analysis also identified a number of RULES, including RULE 21, which ensures L3AWS are prohibited from operating in any capacity other than when reacting to an imminent threat - which is clearly one of the least controversial *just causes*.[886]

A L4AWS that is capable of making strategic level decisions, and of operating at great distance from human command, may perhaps be *most* capable of offending the principle of *just cause* – and, therefore, of initiating wars that might be considered *unjust*. However, the thesis' RULES ensure that except in very limited circumstances,

[886] Larry May (ed.), *The Cambridge Handbook of Just War* (Cambridge University Press, 2018), 7.

such weapons must not be deployed. In sum, while just *cause* is one of two *JWT* principles which is codified in the treaties, [887] there is no evidence to support the line of reasoning that AWS are inherently incompatible with it.

5.1.3 A State Must Ensure that it Goes to War with Appropriate Intentions.

A second *JWT* principle, is that a state must ensure that it goes to war with appropriate intentions. In reality, correct intentions may be difficult to determine. While a retrospective analysis of the decision to go to war may entail an *objective* investigation into the motivations, only a *subjective* appraisal can offer the absolute inspiration.[888] Nevertheless, war should not be used to serve as a cover for the pursuit of an ulterior objective,[889] but must 'be pursued for the reasons that actually justify the war.'[890] Some question the usefulness of considering this principle in solitary,[891] but 'right intention is the requirement that war be pursued *in order* to achieve the just cause'.[892]

5.1.3.2 Autonomous Weapons Systems and the Concept of Appropriate Intentions.

There is perhaps a question whether an autonomous machine could ever be capable of manifesting *intent*.[893] If so, then the use of AWS may contravene the *JWT* principle of *appropriate intentions* where it was delegated decision-making responsibilities regarding the resort to force. As the previous analysis has identified, the *Template* classifies such types of decisions as strategic. Therefore, the decision to resort to force can only be made by a L4AWS. As demonstrated in Chapter Two, a L4AWS can only operate in the most limited of circumstances. And, specifically, this must only be in

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[887] See e.g., Coleman, *ibid,* n.293.
[888] The point the researcher is making here is that in certain circumstances one might reasonably question whether the publicly stated political objectives of a nation necessarily corresponds with deeper personal agendas, and/ or confidential governmental policies.
[889] McMahan, *ibid*, n.883, 5. Also note, the principle of *Pacta sunt servanda* (agreements must be kept) is codified in art. 26 VCLT, *ibid*, 308. This states that 'Every Treaty in force is binding upon the parties to it and must be performed by them in good faith'. The good faith principle can also be seen codified within various other treaties. See e.g., Article 2(2) UN Charter, *ibid*, n,143. This states that, '[a]ll Members…shall fulfil in good faith the obligations assumed by them in accordance with the present charter.' Therefore, any use of force, even if in self-defence, which has a motive different than that which is openly claimed, must *de facto* be seen as an unlawful use of force.
[890] McMahan, *ibid,* n883, 5.
[891] *Ibid.* the author identifies that correct intentions are 'inextricably intertwined with just cause'.
[892] *Ibid.*
[893] This is important not only for the purposes of this discussion, but also to the discussion surrounding the criminal accountability of AWS and the perceived lack of a *mens rea*. This is considered in greater detail in the following chapter.

self-defence where the need to act is instant, overwhelming, with no choice of means, and no moment for deliberation.[894] Due to the L4AWS very existence, a head of state must have delegated the decision-making responsibility. And, implicit in that delegation, is the fact that the human authorising the use of the L4AWS has the *appropriate intention*, i.e., to use force only where there is a *just cause.*

In a further discussion, which is more aligned with the *jus in bello* aspect of *JWT*, an alternative argument is that the concept of *appropriate intentions* requires for a soldier to respect his or her enemy,[895] meaning that 'if robots are incapable of manifesting an attitude of respect, they are incapable of waging war justly.'[896] There may be element of truth to this line of reasoning. However, while machines *may* not be capable of exhibiting intent or respect, they will also be very unlikely to exhibit *inappropriate* intentions, as arguably some human combatants may.

An AWS cannot choose to target and engage either a combatant or non-combatant while trying to conceal its own ill-conceived agenda.[897] There is no doubt it is true that humans are very often perplexed by the complexities of machine learning and are often unable to determine why a certain machine has behaved in the way that it has. This is a primary driver in annexing the following rule, noting that L1AWS are by their very nature non-recoverable,

RULE 45
Every L2AWS and above, must be fitted with an aircraft style 'black box' to record its decision-making behaviours. Where elements of an AWS are not EAI, their decision-making processes must nevertheless be recorded for future access and monitoring.

Nevertheless, regardless of which side of the '*intent*' conundrum is the more persuasive, *JWT* merely requires that agents act only for the 'correct' reasons.[898] This

[894] See e.g., Thesis RULE 38.
[895] See generally, Sparrow, *ibid,* n.579.
[896] Jenkins, *ibid*, n.113, 13.
[897] The point being, only humans can *choose* to ignore the rules which they have been instructed to follow and hide their motivations and intentions for resorting to force. See, Sassoli, *ibid,* 39, 310. Here, the author also highlights that it is only possible for humans to act inhumanly.
[898] Jenkins, *ibid,* n.113, 13-14.

can be achieved with AWS in the same way as it is with any weapons system, advanced, autonomous, or otherwise. If, for example, a remotely operated unmanned aerial vehicle (UAV), or a theatre ballistic missile, or even a simple service rifle was used a tool for inflicting crimes against humanity, the crime would not be committed by the weapon, but a human who wields it.[899] It is, in other words, the human's intentions which must be judged.[900]

Programmers will be responsible for writing the digital code which *must* represent how military commanders and other relevant decision makers *intend* for AWS to behave in any given situation. Not every situation in which the AWS is intended to operate can be determined in advance. However, one would imagine there is a pressing need for an AWS to act 'appropriately' in the circumstances, and that such behaviour is a prerequisite for compliance with international law.

The more *freedom* an AWS has over *jus ad bellum* decision making, the more likely *its intentions* become more significant than those of it operator or commander. Nevertheless, exactly the same rules that were offered in the conversation regarding *just cause*, ensure AWS are kept within the *control* of a human operator, and that the *JWT* principle of *appropriate intentions* is not, therefore offended in all cases. Instead, and in sum, the *JWT* principle of *appropriate intentions* does not provide a reason to restrict the use of AWS any further than has already been identified. *Appropriate intentions,* in other words, supports the use of the thesis' rules identified thus far in accordance with the *Template.*

5.1.4 A State Must Ensure that The Resort to War is the Last Resort.

The two preceding sections have evaluated the use of AWS in relation to two *JWT* principles. One of these is codified in the treaties, and thus it provides an ethical and a legal obligation. The other was considered largely as a stand-alone ethical obligation.

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[899] Schmitt, *ibid*, n.42 quotes the Roman philosopher Seneca the younger, providing: 'a sword is never a killer, it is a tool in the killer's hands.' The author also provides the following citation, Letters to Lucilius, (Michael C. Thomsett & Jean F. Thomsett (eds.) *War and Conflict Quotes* (1997), 158.

[900] See e.g., Horowitz, *ibid*, n.196, 26. Here the author states: '[o]ne could argue that since machines cannot have intentions, they cannot satisfy the *jus ad bellum* requirement for right intentions. Yet this interpretation would also mean that broad swathes of precision-guided modern semi-autonomous weapons that dramatically reduce civilian suffering in war arguably violate the individual intentionality proposition, given the use of computerized targeting and guidance.'

The following discussion introduces the *JWT* principle of *last resort*. This is not directly codified in the treaties. Nevertheless, it is inescapably connected to the prohibition on the use or threat of force that is contained within Article 2(4) UN Charter. In short, *last resort* seeks to ensure that war is a 'necessary means of achieving the *just cause*',[901] and that, states must have exhausted all non-forceful options before resorting to force.[902]

5.1.4.2 Autonomous Weapons Systems and the Concept of Last Resort.

One leading commentator forwards that the principle of *last resort* is the only one of the six *JWT* provisions that is seriously threatened by the introduction of AWS.[903] This claim is based upon the popular argument that the use of AWS will make it easier for States to go to war, or have recourse to force.[904] This is clearly a straightforward reframing of the declaration that the introduction of AWS will lead to a derogation of the Article 2(4) UN Charter prohibition on the threat or use of force. [905] And, a compressive evaluation of this has already been undertaken in Part 1 of Chapter Two.

While that discussion did identify certain *Template* deployments could prove somewhat problematic, the Chapter Two analysis summarised that technological superiority has 'never served as an impetus for going to war'.[906] Instead, AWS, like other weapons before them will only provide a state with an additional instrument to exercise its authority.[907] Although it has perhaps seen something of a return to

[901] McMahan, *ibid,* n.883, 5.
[902] Arguably, last resort can never really be satisfied because a nation will always hypothetically be capable of re-attempting non-forceful actions such as negotiation. See e.g., Ronaldjf Rychlak, 'Just War Theory, International Law, and the War in Iraq' (2004) 2 Ave Maria L. Rev. 1, 8. Nonetheless, the idea of exhausting all other means is implicit in Chapter VII UN Charter, *ibid*, n.143. See in particular art. 41 which provides that non-forceful measures may include 'complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication, and the severance of diplomatic relations.' This is, of course 'complimented' by art. 42 which as a reminder states, 'Should the Security Council consider that measures provided for in Article 41would be inadequate or have proved to be inadequate, it may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security…' I may be useful to note that this provision is not applicable to *all* uses of force, but only those relating to UN pre-authorization.
[903] Horowitz, *ibid,* n.196, 33.
[904] *Ibid.*
[905] Last resort is arguably to some degree both customary law and codified within the UN Charter, *ibid,* n. 143. When acting under its Chapter VII powers, for example, the UNSC must only authorise force where lesser measures 'would be inadequate or have proved inadequate'. See, arts. 39-42 UN Charter respectively. Note, however, that there are other ways in which the use of force can be lawful, but where Chapter VII is not relevant. In other words, although last resort is binding law, it is only applicable in some circumstances.
[906] Toscano, *ibid,* n.355, 266.
[907] Ford, *ibid,* n.156, 430.

prominence in recent years, asymmetric warfare is nothing new. The truth is, those considering the decision of whether or not to go to war do so with reference to many more factors than simply who has the better equipped armed forces.

5.1.4.3 Lowering the Cost of War and The Burden of Risk.

There is one discussion that has regard of the lowering of the 'cost' of warfare argument, that has not yet been considered. It relates to the removal of human emotions, which has, nevertheless, been considered in Chapter Three (3.2.7). The essence of that discussion is relevant, though there is no need to repeat the analysis here.[908] The more pertinent question is instead, should a state place a greater burden of risk upon their own combatants, if that means the risk to the civilian population is reduced.

This question portrays risk as a zero-sum game. And opponents argue that AWS could only fight an *unjust* war because the state deploying them can bypass risk to their combatants altogether. In contrast, enemy combatants and civilians will be subjected to at least 'some' risk where they are located in the vicinity of the violence caused by AWS.[909] Conceivably, this argument will become more amplified the closer a nation gets to replacing all of its combatants with robot soldiers,[910] and more so if L3AWS and L4AWS ultimate replace command and executive decision-making respectively.

While 'risk' is particularly relevant to the *jus in bello*, it can also be considered in terms of waging war (as opposed to fighting in one). Indeed, according to Walzer, a state going to war (and a combatant fighting in one) must display a positive commitment to save civilian lives.[911] He argues that civilians deserve something more

[908] The primary point here is an AWS may not be capable of demonstrating human emotions such as compassion, forgiveness, judgement, honour and respect. However, most military ethicists accept that behaviour in war is primarily constrained by three principles of IHL Necessity, IHL Proportionality, and IHL Discrimination. And, as has been argued by the present researcher throughout, it is likely that AWS will eventually be capable of adhering to each of these with a greater precision than their human counterparts. See, Jenkins, *ibid.,* n.113, 7. In addition, also as previously noted, AWS will not be driven by negative emotions such as revenge, self-preservation, anger, fear. Indeed, the fact that AWS will adhere to IHL better than humans, while remaining free from human emotions, means that they could well be capable of acting more humanely than humans.

[909] The point being that when AWS are capable of operating lawfully in environments in habited by civilians, civilians and civilian objects will ultimately form part of AWS collateral damage assessments.

[910] Jenkins, *ibid,* n.113, 4. Here the author states for example: 'These weapons raise the most serious moral challenges, as they are capable of fully replacing human warfighters'. They are killer robots in the truest sense: while they are programmed with some algorithmic intelligence or machine learning algorithms, they are true agents, and their behaviour is opaque and unpredictable, in the same way that the behaviour of a human soldier may be in some sense predictable, but ultimately up to them.'

[911] Michael Walzer, *Just and Unjust Wars* (Basic Books, 5th edn. 2015), 156.

than simply observing the laws of war.[912] He posits instead that if 'saving civilians lives means risking soldier's lives, the risk must be accepted'.[913] Walzer calls this the concept of double intent.[914] If this was indeed a requirement, then entire L3AWS robot armies, for example, would very likely be considered unethical, and the wars they fight *unjust.*

The position he adopts is, however, far from settled. An alternative perspective, and one which incidentally identifies a moral obligation to use UAVs, is provided by Strawser.[915] He identifies a somewhat conflicting, 'principle of unnecessary risk' (PUR). He argues that PUR requires a commander to minimize the risk to their own soldiers where a greater moral value is not sacrificed.[916] Of course, one of the strongest reasons for supporting the use of AWS from an ethical perspective,[917] and indeed from a strategic perspective, is they conduct targeting assessments faster, and employ force, with greater accuracy, than humans are, and likely will ever be capable of.

According to Strawser's logic, therefore, if an AWS *could* function safely in the presence of civilians, and lives were saved as a result, there is a moral obligation to use it. On some level, Melzer agrees with this sentiment, acknowledging that risk will 'vary with the nature of the target, the urgency of the moment…[and]…the available technology…'[918] As a result, perhaps a more pertinent question (though it is beyond the remit of the current thesis to attempt to answer completely), is not whether AWS are ethical weapons *per se*, but whether morality necessitates a nation to deploy the means which best minimizes, or even removes, the civilian harms that are caused by armed conflict.[919]

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[912] *Ibid.*
[913] *Ibid.*
[914] See, ICRC DPH Guidance, n.558, 156. Here the ICRC argue there is two stages to the decision to use force, 1) effort should be made to avoid civilians casualties, and 2) where necessary by increasing the risk to combatants.
[915] See, Jenkins, *ibid*, n.113, 7 . In turn Jenkins cites, Bradley Strawser, 'Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles' (2010) 9 4 Journal of Military Ethics 9, 342.
[916] *Ibid.*
[917] The point being that while AWS are currently only deployed in restricted environments, the distribution of autonomous tech will in certain circumstances, almost undoubtably, lead to an increase in the protection of civilian life.
[918] ICRC DPH Guidance, *ibid,* n.558, 156.
[919] See e.g., Horowitz, *ibid,* n.196, 34, Here the author noted that the introduction of AWS could 'lead to a world in which humans are removed from the process of warfare than ever before, while warfare itself becomes more precise and involves less unnecessary suffering?'

Chapter Three identified that in the *jus in bello* realm, this is supported, *inter alia*, by the commander's (Article 57(2)(a)(ii) API) obligation to take all feasible precautions.[920] Put simply, AWS deployments may be capable of eliminating harms to friendly combatants even where civilian harms are increased as a result. However, even where this is the case, it would not prevent the use of AWS. Even if an obligation to place the burden upon their own combatants does exist, Article 57 places the decision in the hands of the commander who must assess whether the ends justify the means.[921]

5.1.5 A State Must Ensure that War is Declared and Authorised by the Appropriate Authority.

The next *JWT* principle to which an AWS should be capable of operating in adherence with is appropriate or *legitimate authority*. This is the second *JWT* principle to be codified in the treaties.[922] A traditional interpretation suggests that *war must be publicly declared, and authorised by the appropriate authority.*[923] Today, it is perhaps more appropriate to state that '[o]nly a war lawfully declared, by a government with the authority to declare war, can be a just war.'[924] Semantics aside, however, '[j]ust war theory requires that decisions to wage war be made by those who are legally authorised to do so'.[925] In short, this means states. Thus, even where the UNSC

[920] Art. 57 API, *ibid*, n.43.
[921] Jenkins*, ibid,* n.113, 26.
[922] See, Coleman, *ibid,* n.293. Note that this is not entirely compatible with *all* international legal obligations. For example, in seeking to 'plug the gaps' in the Covenant of the League of Nations (1919), the Kellogg-Briand Pact (1928) *ibid*, n.138, which remains in force today, rather optimistically abolishes the concept of a legal war altogether. See e.g., Marc Weller, 'Introduction: International Law and the Problem of War' in Marc Weller (ed.) *The Oxford Handbook of The Use of Force in International Law* (OUP 2015), 10. Also see, Randell Lesaffer, 'Too Much History: From War as Sanction to the Sanctioning of War' in Marc Weller (ed.) *The Oxford Handbook of The Use of Force in International Law* (OUP 2015), 52. Clearly, the obvious difficulty here is that it is not possible for an any authority to declare war, when war itself is as an unlawful act.
[923] Coleman, *ibid,* n.293, 32.
[924] The primary difference here is, for example, that while wars were previously fought and justified on behalf of the church, and often by royal decree, today, only nations can declare war. See e.g., Common Article 2, *ibid*, n.513. One should also note that common art. 2 ensures that today, the laws governing the use of force recognise that war is war, however declared. See e.g., Dinstein, *ibid*, n.244, para. 104. Here the author notes: 'LOIAC relates to hostilities…regardless of any recognition of a formal state of war.' Indeed, the commencement of war without a formal declaration is still the commencement of a war. Therefore, in lieu of an absolute declaration, any contemporary analysis of just war theory must acknowledge that an actual use of force should be taken as declaration of the intent to resort it.
[925] Regan, *ibid,* n.885, 20. Regan in turn citing Thomas Aquinas, *Summa theologiae,* I-II, Q. 40, A. 1.

authorises the use of force, 'the council has no power to mandate that the armed forces of member states participate'.[926]

5.1.5.2 Autonomous Weapons Systems and the Concept of Appropriate Authority.

If, to be considered *just,* a war must be *declared and authorised by the appropriate authority*, an AWS could potentially be delegated with the responsibility to 'choose' whether or not war should be declared. For many reasons—not least the obvious national security implications should the AWS 'get it wrong', it is tremendously unlikely that states would hurry to do this.[927] As has already been considered with regard to strategic decision-making, if the *Template* and thesis' accompanying RULES are utilised, in the vast majority of instances such AWS deployments would be prohibited.

Even if L4AWS, for example, were capable of operating in the *jus ad bellum* realm without having the authority to declare war, that does not prevent all *Template* classifications from operating lawfully and in adherence of appropriate authority. In addition, regardless of how willing a state is to deploy L4AWS, the contemporary interpretation of *JWT* is that a resort to force with any weapon should be taken as a declaration of a state's intent to do so.[928] Consequently, in most instances, when any AWS is deployed, it should be taken as statement of intent that the *state* is willing to respond with force, and not that the weapon itself is authorising a use of force or declaring war.

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[926] Regan, *ibid*, n.885, 41. This is because art. 43 UN Charter, *ibid,* n.143 states: '(1). All Members of the United Nations, in order to contribute to the maintenance of international peace and security, undertake to make available to the Security Council, on its call and in accordance with a special agreement or agreements, armed forces, assistance, and facilities, including rites of passage, necessary for the purpose of maintaining international peace and security. (2). Such agreement or agreements shall govern the numbers and types of forces, their degree of readiness and general location, and the nature of the facilities and assistance to be provided. (3). The agreement or agreements shall be negotiated as soon as possible on the initiative of the Security Council. They shall be concluded between the Security Council and Members or between the Security Council and groups of Members and shall be subject to ratification by the signatory states in accordance with their respective constitutional processes'.

[927] Other reasons not to delegate this level of responsibility include, as has been previously identified on a number of occasions, the fact that strategy must remain an inherently human activity.

[928] Subject to the conditions that have been considered elsewhere, such as the degree of the force applied. See, Chapter Two, §2.2.2.

A pertinent example is the use of an autonomous missile defence shield (MDS) to repel an armed attack. As previously identified, the very existence of such a system must be taken as evidence that the legitimate authority supports its use. In other words, given that in most circumstances a use of force in this manner would also be taken a declaration of war,[929] an autonomous MDS strike should also be seen as declaration of war, and that the decision was made (and delegated) by the legitimate authority.

5.1.6 A State Must Ensure That it Goes to War Only When There is a Reasonable Probability of Success.

The fifth condition that must be satisfied for a use of force to be considered *just*, is that a party must go to war in the belief that is has a reasonable probability of success.[930] This principle is inherently subjective in nature, and as a result, some question its usefulness as an independent criterion.[931] Nevertheless, this principle is self-fulfilling – in that states are unlikely to risk the associated financial and political costs of entering an armed conflict without holding at least some hope that victory was possible.

This may not, however, *always* be the case. For example, a state might risk entering into a war which they had little chance of winning, simply because the odds are more favourable than the odds of remaining in power should they chose to take no action.[932] Other factors may also influence the decision to enter conflict, such as the matter of whether one leader might be prepared to suffer much higher loses than another. This would, of course, drastically alter the formers subjective perception of their chances of winning.[933]

5.1.6.2 Autonomous Weapons Systems and the Concept of Reasonable Probability of Success.

The matter of whether an AWS could encourage a State to resort to force with a less than reasonable chance of success is intrinsically intertwined with the suggestion that AWS inherently reduce the cost of war. This has already been considered on two

[929] See generally, Green and Waters, *ibid*, n.299.
[930] See generally e.g., Frances V. Harbour, 'Reasonable Probability of Success as a Moral Criterion in the Western Just War Tradition', (2011) 10:3 Journal of Military Ethics, 230.
[931] McMahan, *ibid*, n.883, 5.
[932] Yoo, *ibid,* n.265, 492.
[933] *Ibid,* 493.

previous occasions, thus there is no need for repetition here. Nevertheless, one vital observation to make, is that a *less than reasonable* chance of success must not be confused with a *reduced chance of success*. A useful example to consider here is humanitarian intervention (HI), which was introduced in Part 4 of Chapter Two.

Regardless of whether or not HI is lawful, which has been discussed previously, it is widely acknowledged that HI operations are more successful when 'boots are on the ground'.[934] Nevertheless, this does not mean that boots *have* to be on the ground. A past operation which is regularly used as a 'cautionary tale' is the high-altitude bombing campaign undertaken by NATO forces in (the former) Yugoslavia in 1999.[935] In that campaign, NATO commanders chose to utilise air power, in order to drop bombs from around 15,000 ft., as an alternative to deploying ground forces in the region.

Notwithstanding the matter of assigning 'burden', which in this instance was squarely placed on the adversarial and civilian population, this tactic helped to prevent mass atrocities such as genocide and ethnic cleansing. Without ground support and minus the ability to capture, this operation was conducted with a reduced, but not necessarily, less than, reasonable chance of success.[936] Indeed, it is simply a folly to suggest that a state (or its agents) *must* use the method that has the greatest probability of success.

One reason this must remain the case, regardless of whether the weapon used is an AWS, is that the greatest chance of success might also be most destructive. [937] Under

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[934] Coleman, *ibid,* n.293, 37.

[935] Jenkins, *ibid,* n.113, 7. Here the author states, for example: 'Humans naturally seek to avoid certain risks of bodily harm. This has led militaries in the past to make choices that subject civilians to greater harm than is strictly necessary, in order to avoid harm to their human soldiers. A storied example of this, which has been canonized in the literature as a cautionary tale, is the case of NATO's bombing operations in Yugoslavia in 1999. It requires a great deal of political capital to put boots on the ground in any military campaign. Because NATO's constituent countries were unable or unwilling to muster that capital, they chose instead to limit themselves to bombing their targets from altitudes of several thousand feet, inevitably reducing the accuracy of their bombs. This has become a textbook example of shifting the burden of risk away from one's own soldiers and onto civilians.'

[936] Coleman, *ibid,* n.293, 36.

[937] See e.g., art. 35(3) API, *ibid*, n. 43. This states, 'it is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment'. In addition, see, art. 55 API, *ibid,* n.43. This adds, '(1) Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population. (2) Attacks against the natural environment by way of reprisals are prohibited . For more discussion see e.g., Vanessa Murphy, Helen Obregón Gieseken and Laurent Gisel, 'Guidelines on the Protection of the Natural Environment in Armed Conflict' (ICRC, September 2020) https://www.icrc.org/en/document/guidelines-protection-natural-environment-armed-conflict-rules-and-recommendations-relating accessed 1 December 2020, and, Antoine Bouvier, 'Protection of the

certain circumstances, a commander may instruct his troops to conduct the operation which had the second, or perhaps even the third best chance of success. And this clearly supports the notion, that commanders may legitimately deploy an AWS, in adherence with the wider body law and RULES identified herein, where they are in possession of the knowledge that human soldiers may have greater chance of conducting a successful operation.[938]

An additional argument is that an individual or, for example, a Non-State Armed Group (NSAG) could inherit an AWS and chose to wage war, doing so with no reasonable probability of success. However, in almost all instances they would fail to satisfy *just cause*, having no territory to defend, and no *legitimate authority* to declare war. In addition, one must question whether such actors are any more likely to use an AWS, than they are an ICBM, or remotely piloted UAV, where they had recourse to such systems.[939]

The pivotal recognition here, is that providing an action with an AWS has 'a' reasonable chance of success, there is nothing to suggest this principle prevents a state from using an AWS to wage a *just* war. Consequently, while the present author is hesitant to translate an ethical concept into soft law principle, the following also reflect the discussion previously undertaken in Chapter Three regarding of the reasonable military commander. Thus,

natural environment in time of armed conflict' (*ICRC,* 31 December 1991) https://www.icrc.org/en/doc/resources/documents/article/other/57jmau.htm accessed 11 July 2021.

[938] Of course, this is innately related to humanitarian protection/ intervention (as considered in Chapter Two). The point being a nation (and its citizens) may feel more at ease deploying AWS, rather than human combatants, to conduct extraterritorial humanitarian operations, because of the reduced burden of risk.

[939] It is perhaps worth noting that although it might not always be possible to hold them 'accountable' under international law, if AWS were deployed by either a rogue State, NSAG, terrorist organization, or individual, the victim state may nevertheless have a *just cause* for going to war.

RULE 46
A state (or its agent, such as a commander) must only deployed AWS where there is a reasonable, or more than reasonable chance of mission success.

5.1.7 A State Must Ensure That the Overall Cost of War is Proportionate to the Benefit Obtained from Going to War.

The sixth, and final, *JWT* principle that is considered in Part 1 is otherwise referred to as *proportionality*. This is third time the thesis has evaluated this concept – following the separate *jus ad bellum* and *just in bello* interpretations and subsequent examinations. *JWT Proportionality* is inextricable linked with *just cause*.[940] In short, 'no act of war can be proportionate in the absence of a *just cause*.'[941] Moreover, while *just cause* is perhaps seen as the most significant principle, *proportionality* is also key because it can greatly restrict what amounts to a *just cause*.[942]

To be considered a *just* war, the overall cost of the war must be proportionate to the benefit that is set to be gained from going to war. This must represent more than merely the financial cost, but the harms involved as well.[943] In order for it to be satisfied, in other words, *proportionality* requires that the 'good be great enough to outweigh the relevant bad effects of the war',[944] and/ or, that 'the decision to wage war will be justified only if the wrong to be prevented…surpasses the reasonably anticipated human and material costs of the war.'[945]

[940]McMahan, *ibid,* n.883, 17-19. Also see, Roff, *ibid*, n.293, 39-40. He the author identifies her work follows on from that of Thomas Hurka*,* 'Proportionality and the morality of War' [2005] 33 1 Philosophy & Public Affairs. For another relevant discussion also see, Newton & May, *ibid,* 878, 67.
[941] McMahan, *ibid,* n.883, 6.
[942] Newton & May, *ibid*, 878, 67-68. Also see e.g., Regan, *ibid*, n.885, 84. At this juncture the author posits '[j]ust war theory requires that those who make decisions to wage war should be constitutionally and legally authorized to do so, and that wars should be waged only for proportionately just causes'.
[943] Coleman, *ibid,* n.293, 32.
[944] McMahan, *ibid*, n.883, 3-4.
[945] Regan, *ibid*, n.885, 63. The author notes that in seeking to assess JWT *proportionality* 3 judgments must be made. These have regard of: (i) the *worth* of the cause that is said to justify recourse to war, (ii) the *facts* about the wars likely causalities and costs, and (iii) the worth of the wars cause in relation to the likely casualties and costs. Regan notes that while these three are inherently subjective evaluations, they nevertheless regard an objective yardstick: 'the cause's real worth in terms of human values.'

5.1.7.2 Autonomous Weapons Systems and the Concept of Just War Theory Proportionality.

Opponents believe that *proportionality* can be utilised to support their calls for a prohibition on the development and use of AWS.[946] This is due, primarily, to the claim that the wider *costs* of deploying AWS are simply too great. In other words, the reasoning is, that even if AWS can eventually become more capable of adhering to international legal obligations, the ends simply do not justify the means.

Offering what is perhaps the most focused *proportionality* discussion, Heather Roff argues that this *JWT* principle requires for parties to look beyond a 'one round game'.[947] Roff insists that AWS should be prohibited, before the inevitable arms race occurs, which will make *unjust* wars conducted with all-robot armies all the more likely.[948] The primary problem with this argument, is that it is utterly reliant upon defining AWS in general terms - the dangers of which were addressed in Chapter One.[949]

In failing to provide something akin to the *Template*, such arguments appear content to ignore any reference, for example, to simple L1AWS munitions. Indeed, they also fail to identify that providing a suitable legal framework is in place, L2AWS can also be deployed with a sufficient element of Meaningful Human Control (MHC) in the majority of circumstances. Roff's discussion is instead fundamentally grounded in the concept of entire L3AWS and potentially L4AWS, and complete robot armies fighting a battlefield that is devoid of human combatants (at least on the side deploying AWS).

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[946] The two leading arguments that are considered in the following section are generally, Roff, *ibid,* n.293, and Tamburrini, *ibid,* n.318.

[947] Roff, *ibid,* n.293, 47-51.

[948] *Ibid,* 50. Here Roff offers additional, loosely connected, proportionality arguments. As has previously been considered, she also questions the 'moral permissibility' of going to war in the knowledge that it would be fought with AWS instead of a human army because it would be unjust to fight a war where there was no lethal or grave threat to humans. She also offers, for example, that if AWS are used as a method of defending political independence, and/or territorial sovereignty, they reduce the chance of reaching a peaceful settlement and the achievement of ones *just causes* [pp 47]. She supports this by suggesting that when AWS are used in self-defence the requirement to demonstrate imminence could also not be met, meaning the use of AWS in such circumstances would be unlawful as well as unjust [pp 44-45]. Even if true, the narrow nature of this line of reasoning does not prove AWS to be inherently unjust.

[949] See, Tamburrini, *ibid,* n.318, 124-127. He sees that 'the distinctive problem concerning AWS' is the lack of a suitable definition. However, he does not make any attempt to address the lacuna but prefers instead to highlight some of the reasons why he chooses not to classify certain weapons as autonomous.

In this respect, the present author does not seek to assert that Roff is altogether wrong to suggest that moving forward, there should be some 'skin in the game'.[950] However, even if it was presently considered morally wrong to conduct armed conflict upon battlefields that were entirely devoid of human beings, it is not altogether clear whether that will remain the case in the future. [951] The technology that would be needed to allow for such a scenario is a long away from the drawing board - yet alone the labs and engineering facilities of the big tech companies.

In the short to medium term, wars will almost certainly continue to be fought with incrementally advanced munitions (some of which are already autonomous), and regular platforms (some of which will continue to exhibit increasingly autonomous features). And, even if the development of some AWS could lead to instances where *JWT proportionality* is threatened, all AWS deployments can be classified upon the *Template*, and moreover, regulated by way of the thesis' rules.

Tamburrini offers a similar argument, though it is not explicitly posited in terms of *proportionality*. Instead, he introduces what he refers to as "the wider consequentialist reasons" for banning AWS. Initially, he grounds a part of his discourse in the claim that if the use of AWS is permitted it will inevitably lead to an arms-race,[952] and that the affiliated proliferation of AWS technology will make it easier for states to wage war. [953] This argument needs no further discussion here. The point he suggests is that the threat to long-term international peace and security must *trump* any shorter term, 'narrow' consequentialist arguments such as those relating to improved targeting.[954]

Tamburrini identifies autonomous 'swarms' (L3AWS) as being a particular threat to the global security balance, and believes that their introduction would incentivise some states to strike first.[955] Indeed, he argues that swarms could make it easier to launch attacks on major infrastructure, which could ultimately undermine the fabric of existing nuclear deterrent strategies that are based upon an understanding of 'mutually assured

[950] Roff, *ibid*, n.293, 50.
[951] The point being that perceptions of AWS are due to change alongside a growing acceptance of machine intelligence in society generally.
[952] Tamburrini, *ibid,* n.318, 140.
[953] *Ibid,* 139. Indeed, to this end he supports the claim that AWS will provide states with fewer disincentives to start wars. See, Noel Sharkey, 'Cassandra or False Prophet of Doom: AI Robots and War' (2008) 23:4 IEEE Intelligent Systems, 14.
[954] Tamburrini, *ibid,* n.318, 137-141.
[955] *Ibid.*

destruction'.[956] Although, this is once again ignores the point that Article 2(4) already prohibits the use of force with any weapon (including AWS), he utilises the potentially catastrophic consequences of deploying AWS to support the *proportionality* argument. As a result, he implicitly endorses Roff's call for a prohibition based on the *JWT* principle of *proportionality*.

The current researcher is not altogether unsympathetic to this line of reasoning. And it is undeniable that the issues that surround L3 swarming AWS are complex and numerous in nature. Nevertheless, as a result of their potential to drastically alter battlefield equilibriums, the thesis' RULES that have been offered throughout generally attempt to restrict their use. At the very least, these prohibit the vast majority of AWS from being delegated decision-making responsibilities of a strategic nature. However, they also seek to ensure that MHC is retained over all targeting decisions where AWS are utilised.

5.1.8 Autonomous Weapons Systems and Just War Theory: In Sum.

Part 1 has considered perhaps the single most technologically advanced method of waging war, in light of a theory which has been utilised for centuries. It did so to determine whether the resort to force with the use of AWS should be considered *just*. The six principles of *JWT* help to peer beyond strict positive law obligations, to wider questions relating more generally to the ethics of war, and possibly further into the moral codes that might be inherent within the individuals that are affected by it.

Nevertheless, having conducted a comprehensive analysis those six principles alongside with the various *Template* classifications (noting that much of this analysis has occurred in previous chapters) there is no evidence to suggest that *JWT* intrudes into, or in any way disrupts the researchers hypothesis. Indeed, as opposed to supporting the claims of those in opposition to AWS, *JWT* can actually be utilised to substantiate the general viewpoint offered herein - that the *Template* provides a unique method of allowing the potential humanitarian benefits of to prosper, while the risks, and longer-term dangers of AWS are negated.

[956] Tamburrini, *ibid*, n.318, 140.

PART 2 Ethical Concepts Codified in Legal Treaties.

Introduction.

Part 1 identified that AWS deployments are compatible with the six principles of *JWT*—the long-established method of assessing whether a particular resort to force can be morally justified. Part 2 evaluates AWS deployments beyond positive legal obligations. And, although in the first instance it may appear somewhat paradoxical, it does so by returning to the treaties considered in previous chapters. From the legal disciplines that have already been considered, three especially relevant concepts can be identified. These are, (i) the Marten's Clause/ Article 1(2) API, (ii) Article 36 APII, and (iii) Human Dignity. The following analysis assesses the use of AWS alongside each of these concepts. Each provision does appear to require a state to have regard of a wider ethical responsibilities. However, the researcher will demonstrate that each 'obligation' is remarkably opaque. Thus, they are all incapable of providing strong foundational support to claims that AWS should be prohibited.

5.2.2. The Martens Clause.

The first of the *ethical* concepts that Part 2 examines, and which is relevant to AWS deployments, is the Marten's clause. This analysis could well have taken place in Chapter Three under the *jus in bello.* It is most suitably located in the present chapter, however, because the clause's primary purpose is to encourage states to look beyond their positive legal obligations, to their 'wider' moral and ethical responsibilities.[957] Because this analysis is based upon a (quasi) legal obligation, the following examination identifies this first. The aim of Part 2 is then to determine whether Martens Clause provides an existing independent means for prohibiting AWS.

As is identified below, a modern version of the Martens clause can be identified in AP I. Nonetheless, it is useful to first consider its historical context. The Clause was originally submitted by Russian diplomat Fydor Fydorivich Von Martens, before it was subsequently added to the preamble of the 1899 Hague Convention. [958] It exists, and

[957] See e.g., HRW (2018), *ibid*, n.283, 6.

[958] See, Preamble of the 1899 Hague Convention, *ibid,* n.138 It was also included in preamble to the Hague Convention (IV) (1907), *ibid*, n.138. Noting that for those party to both Hague Conventions, the latter replaces the former. Note that while the preamble to an international treaty may provide a very useful aide, is not intended to be legally binding.

indeed, was placed in the preamble, because at the time the parties were unable to agree on the precise nature of the text which should be contained within the treaty articles. [959] It states,

> '[u]ntil a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the Regulations adopted by them, populations and belligerents remain under the protection and empire of the principles of international law, as they result from the usages established between civilized nations, from the laws of humanity and the requirements of the public conscience'.[960]

While the preamble to a treaty is non-binding in nature, the ICJ has identified that a modern version of the clause is codified within Article 1 of API. [961] This provides,

> '[i]n 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.'[962]

In the first instance, both the Martens Clause, and Article 1 API, are clearly only intended to apply in the event that no relevant international law obligation exists. Where that is this case, a state must have regard for three concepts. The first of these is perhaps more succinctly alluded to in Article 1 - established custom. This will include, for example, the IHL principle of distinction – a widely accepted customary norm. [963] Although sometimes ambiguous, customary rules are not in themselves

[959] See, HRW (2018), *ibid*, n283, 9. Here it states '[T]he great powers disagreed about how much authority occupying forces could exercise over the local population.'
[960] Hague Convention (II) (1899) *ibid,* n.138.
[961] *Nuclear Weapons Advisory Opinion, ibid,* n.73, para. 84.
[962] Seeing as the last sentence of art. 1 API almost exactly repeats the text of the Martens Clause, the remainder of this discussion refers only to the Marten's Clause. However, unless otherwise identified, the discussion is intended to refer to both.
[963] See e.g., *ICRC Customary Rule 1*, *ibid*, n.518.

particularly controversial. Indeed, they are crucial to the correct functioning of international law.[964]

This cannot be said about the second and third concepts, i.e., the principles of humanity, and the dictates of public conscience. Indeed, these each have an undeniably ambiguous nature. And, as a result, there is confusion about the extent of the obligation that is contained within the clause. Notwithstanding the more recent binding incarnation, the Martens Clause has always been a particularly controversial concept.[965]

Some claim that it ensures states comply with the natural law,[966] though it is fair to say that this legal theory is in itself, somewhat controversial.[967] And, the international judiciary have tried to insert it as independent humanitarian principle in its own right.[968] In contrast, others are hesitant to focus entirely upon the second and third concepts, believing instead that the clause should serve only as a reminder of the existence of customary international law.[969]

The ICJ have also commented that the clause itself has a customary nature,[970] and that its continuing existence and applicability should not be doubted.[971] And, other than in the overruled judgement in Kupreškić,[972] they have never attempted to identify it is an independent legal principle or establish the precise nature of the obligation. Moreover, as noted by Dinstein,[973] it is perhaps somewhat noticeable that the yardsticks used by

[964] See e.g., Dinstein, *ibid,* n.244, pars. 43-45.
[965] Antonio Cassese, The Martens Clause: Half a Loaf or Simply Pie in the Sky?' (2000) 11 1 EJIL 187, 187.
[966] Rupert Ticehurst, 'The Martens Clause and the Laws of Armed Conflict' [1997] 317 Int'l Rev. R.C. 1 available at < https://www.icrc.org/eng/resources/documents/article/other/57jnhy.htm > accessed 23 April 2018. At pp.3 Ticehurst suggests the clause is an important link between positivism and the natural law, due in part to natural laws wholly subjective approach.
[967] See generally e.g., Kevin M Staley, 'New Natural Law, Old Natural Law, or the Same Natural Law' (1993) 38 AM J JURIS 109, Robert P. George, 'Natural Law' (2008) 31 Harv. J. L. & Pub. Pol'y, 171.
[968] See, Prosecutor v. Kupreškić *et al.* ICTY Trials Chamber (2000), IT-95-16, para. 525. Noting that Dinstein, *ibid*, n.244, para. 40 identifies that 'the Kupreškić judgement is flawed not only in this respect…the Appeals Chamber found that no less than a 'miscarriage of justice' had occurred…'
[969] Dinstein, *ibid,* n.244, para. 38. Here Dinstein in turn cites, Cristopher Greenwood, 'Historical Development and Legal Basis' in Dieter Fleck (ed.) *The Handbook of International Humanitarian Law* (2nd Edn. OUP, 2014), 34-5.
[970] *Nuclear Weapons Advisory Opinion*, *ibid,* n.73, para. 84. Though note that ICJ advisory opinions are not generally considered to be binding *per se*.
[971] *Ibid,* para. 260.
[972] Kupreškić, *ibid,* n.968.
[973] Dinstein, *ibid*, n.244, para 38. Dinstein in turn cites, Theodor Mero, 'The Martens Clause, Principles of Humanity and Dictates of Public Conscience' (2000) 94:1 AJIL 78, 87.

the court were the IHL principle of distinction, and prohibition on causing unnecessary suffering.[974]

Some believe that while it is unmistakable that the 'principles of humanity' and the 'dictates of public conscious' can play a central role in fostering the evolution of the laws of armed conflict,[975] it is arguable whether they should 'constitute an additional strata of the law.'[976] As a result, while the clause is gaining traction among opponents of AWS as means for supporting their calls for a prohibition, a number of leading scholars have simultaneously questioned whether it could ever realistically be identified as an independent legal principle which prohibits AWS, and to which all States are bound.[977]

To summarise, the Martens clause contains three concepts, to which states should have regard, in novel circumstances which are not reflected by international law. Perhaps due to its ambiguous nature, it is perhaps interesting to note, that before the discussion regarding the introduction of increasingly advanced AWS appeared, there had not been a great deal of emphasis placed upon the Martens clause. Moreover, the clause cannot be said to have ever been directly utilised as a legal ground for prohibiting the development and use of any previous weapons system.[978]

5.2.2.2 Autonomous Weapons Systems and The Martens Clause.

As has been discussed in previous chapters, one of the most vocal opponents of AWS is *HRW*. Since their initial 2012 report identifying the risks posed by AWS, they have consistently utilised the Martens clause to support their call for a *Prohibition*. In their

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[974] *Nuclear Weapons Advisory Opinion, ibid,* n.73, para.78.
[975] Dinstein, *ibid,* n.244, para. 38.
[976] *Ibid*.
[977] See, Dinstein, *ibid.* n.244, para. 38. Schmitt, *ibid*, n.42, 31-32. Also see generally, Beer, *ibid*, 638. The author posits, for example, that the concept is weak and that if states are truly looking to strengthen humanitarian considerations in armed conflict, they need to build a better understanding into their militaries rather than relying upon such an ambiguous provision. Also see, John J. Merriam 'Affirmative Target Identification: Operationalizing the Principle of Distinction for U.S. Warfighters' (2016) 56 Va. J. Int'l L. 83. Merriam also supports the idea of personnel training being at the heart of improving adherence to humanitarian concerns. The point here is, they both provide that a more professional military will ultimately lead a reduction in fatalities to both combatants and the civilian population, but only if such changes are enshrined within the law. And, as yet, regardless of art. 1 API, *ibid,* n.43 they believe that it is not yet.
[978] HRW (2018), *ibid,* n. 283. Here HRW claim the clause may have influenced discussions regarding certain weapons, for example, the pre-emptive ban on blinding lasers in the 1990s, HRW (2018), 16-18. Yoo, *ibid*, n. 265, 448. Here, for example, the author suggests 'restraint arrives through deterrence, not law or morality'.

2018 publication,[979] for example, they suggest that the clause's purpose is to ensure that there is always 'a baseline level of protection to civilians and combatants when specific law does not exist'.[980] Their claim that this protection can be called upon directly to ban AWS is multi-dimensional. In the first instance, they offer that AWS offend the concept of *humane treatment,* it being a *core* element of the principle of humanity. In addition, they argue that the dictates of public conscious, or the 'shared moral guidelines that shape the actions of states and individuals' also indicate a general opposition to the introduction of AWS.[981]

5.2.2.3 Autonomous Weapons Systems and The Principle of Humanity.

HRW identify that a key component of *humanity,* is the requirement to treat others the humanely.[982] The report continues, in order to treat others humanely, one must exercise *compassion,* and make legal and ethical judgments.[983] According to HRW, this requires access to *emotions,* which AWS do not, and cannot, possess.[984] The reader may observe that this claim has been dealt with elsewhere in the thesis. For example, it may well be the case that emotions are implicitly human, and, in some instances, they may prevent war crimes from taking place.

However, it is also true that contemporary belligerents receive training and instruction to ensure they become 'fearless warriors'.[985] And, there is no doubt that these warriors are sometimes be driven by fear, revenge, and internal bias amongst other things. These are not, in the most part, considered to be positive emotions. In addition, it must be questionable whether the potential benefits of a weapons with a *Template* classification

[979] HRW (2018), *ibid*, n. 283.
[980] *Ibid,* 1.
[981] *Ibid*, 28. They also offer a third, and fourth line of reasoning. These are grounded in (i) the concept of human dignity, which is considered in greater detail in the following section, and (ii) the importance of customary law, which is a common thread throughout this thesis, thus there is no requirement to examine that further here.
[982] *Ibid,* 19. HRW highlight a number of treaty articles which reference the concept, including Common Article 3 of the Geneva Conventions. This has been considered in previously, for example, in Chapter Four where the analysis had regard of the relationship between IHRL and IHL.
[983] HRW (2018), *ibid*, n.283, 20.
[984] *Ibid,* 21.
[985] See e.g., Corn and Schoettler, *ibid*, n.534, 796. Here, in particular, the authors note: 'The brutal reality of warfare necessitates that military personnel be incorporated into a warrior culture. This requires developing within the soldier a "warrior ethos" – an instinct for combat aggressiveness, decisive action, and the willingness to unleash maximum combat power on an opponent to accomplish the military mission.'

of L1AWS, such a smart-grenade, should be disregarded because its calculation parameters do not include an ability to display empathy or benevolence.

HRW also repurpose another argument which has already been examined – this time in the Chapter Four, Part 2 analysis. They emphasis, for example, that *empathetic* behaviour can be responsible for ensuring that belligerents apply the least amount of force possible - noting this is important because capturing the enemy is *better* than killing where possible.[986] They add that AWS would be incapable of satisfactorily applying a subjective analysis, and thus, they will be unable to 'interpret the nuances of human behaviour, understand the political, socioeconomic and environmental dynamics of the situation.'[987]

While IHRL may require a minimal use of force, there is no such IHL obligation. HRW may argue to be alluding to an ethical obligation, rather than a strictly legal one. Though, this completely discounts the concept of warrior culture.[988] Moreover, subjective interpretations of legal and moral principles is not necessarily a good thing, because it can indeed lead to instances where, due to a combatants 'youth, education, values, religion or ethics' such principles will be applied unequally.[989] Consequently, one questions whether it is right that an individual could turn out to be better protected by one combatant, than they are from another.[990] In short, the human emotion argument is simply too weak. Especially given the legal obligation from which *HRW* claim the obligation ensues makes no direct link to it.

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[986] HRW (2018), *ibid,* n.283, 20.
[987] *Ibid*, 22.
[988] An interesting associated discussion here, though it is beyond the remit of the present thesis to consider any further, is that if humans *must* remain on the battlefield, combatants *will* continue to be trained to kill other combatants. As noted *ibid*, n.985 soldier training is unlike anything that occurs outside of the military. In many instances, establishing the warrior ethos will require an individual to alter their moral perception, and to forget much of what they had previously learned as a civilian. However, in many instances, having been trained to act like a fearless warrior, a soldier may never go to war. Instead, he or she might return to civilian life, where they would need to readjust and alter their moral perception once again, while perhaps remaining tremendously conscious still of the warrior within (of course, the same might be true of individuals who have been deployed to battle as well). If robots did replace human soldiers, their phycological wellbeing would not, of course, be a relevant factor. For a useful discussion see, Deane-Peter Baker, 'Episode 93: On Morality at War' (*The Dead Prussian,* 31 May 2020) https://thedeadprussian.libsyn.com/episode-93-on-the-morality-at-war-the-dead-prussian-podcast accessed 13 July 2021.
[989] Sassoli, *ibid,* n.39, 334-35. Also, at pp.310, Sassoli also notes '[o]nly human beings can be inhumane, and only human beings can deliberately choose not to comply with the rules they were instructed to follow.'
[990] *Ibid.*

5.2.2.4 Autonomous Weapons Systems and The Dictates of Public Conscience.

According to *HRW*, the 'dictates of public conscience' ensures that law is instilled with a sense of morality.[991] They suggest *public conscious* should be taken to mean a set of shared guidelines that '…are based on a sense of morality, a knowledge of what is right and wrong'.[992] They also posit that there are two primary ways of gauging this sense or 'feeling', public opinion, and the opinion of governments. With regard to the former, *HRW* argue 'surveys conducted around the world...[that]…show widespread opposition' to AWS.[993]

To demonstrate, they present their findings that 39 per cent of individuals are questioned strongly opposed to AWS, and 16 per cent are somewhat opposed AWS.[994] As a result, they submit, public opinion demonstrates that 55 per cent of individuals are opposed to AWS.[995] Regardless of the fact that this study only had a base population of 1000, which allows for greater inaccuracy,[996] there are still 45 per cent of individuals who appear to be in favour of AWS.

And, while *HRW* appear content to write this sizable section off, the complex discussion regarding AWS cannot simply be resolved by introducing a 'first past the post' logic. 45 per cent is a significant proportion of those questioned, and too large a number to suggest that views do not also represent an alternative dictate of public conscious. Therefore, although HRW forthrightly claim that the 'majority of people surveyed found the prospect of…[AWS]…unacceptable',[997] the reality is that public opinion can be said to bifurcated at the very most.[998]

Continuing their assessment of 'public opinion', HRW also consider a number of institutions, organizations, and individuals who have spoken on AWS. They consider the views of peace and faith leaders, for example, experts from industry, science and

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[991] *Ibid,* 28
[992] *Ibid.*
[993] *Ibid,* 30.
[994] *Ibid,* 30-31.
[995] *Ibid,* 30.
[996] See e.g., https://www.surveymonkey.co.uk/curiosity/how-many-people-do-i-need-to-take-my-survey/ accessed 13 May 2021. Here, it is noted, 'The closer your sample is in relation to the total population, the more representative your results are likely to be.' This may appear somewhat alarming, seeing that HRW appear to be arguing that their study represents the entire worldly population.
[997] HRW (2018), *ibid*, n.283, 30.
[998] Notwithstanding the fact that by failing to classify AWS such as the present thesis does, much of the opinion provided in the polls could, in reality, be applicable to a distinct variety of weapon types.

technology, and highlight the significant contributions that HRW themselves have made in recent years.[999] Nevertheless, as the thesis has consistently demonstrated, the legal arguments that are repeatedly relied upon by these opponents are consistently, and significantly, flawed. There is *always*, an alternative, and often well-supported perspective. Therefore, while the opinions of the expert signatories to the open letters that have been submitted to the United Nations (UN) in support to the prohibition can, for example, be taken as *an* indication of a public opinion, it is not the only public opinion. As the thesis has demonstrated throughout, there is also a great deal of literature in support of AWS, albeit, most often when AWS are considered alongside certain restrictions.

5.2.2.5 Does the Martens Clause Apply to the Development and Use of Autonomous Weapons Systems?

The analysis regarding the Martens Clause has, thus far, concentrated on whether the principles of humanity, and the dictates of public conscience prevent AWS deployments. HRW, like others, argue that the Martens Clause is applicable because IHL 'does not contain specific rules for dealing with fully autonomous weapons'.[1000] However, in contrast, this final section examines whether the Martens Clause is even relevant to AWS deployments. This is, at the very least, questionable, not least because the Martens clause (and its contemporary counterpart), contains a clause of their own.

Clearly, HRW are correct to identify that the '[d]rafters of the Geneva Conventions could not have envisioned the prospect of a robot that could make independent determinations about when to use force without meaningful human control'.[1001] Nevertheless, the analysis in the preceding three chapters has demonstrated that does not mean that contemporary international law necessarily fails to account for AWS. Moreover, while ICJ has identified that the Martens Clause has 'proved to be an effective means of addressing the rapid evolution of military technology',[1002] there is no instance where the clause has been utilised as the primary motivation for drafting a new prohibitive weapons Treaty.

[999] HRW (2018), *ibid*, n.283, 32
[1000] *Ibid,* 13.
[1001] *Ibid,* 14.
[1002] *Nuclear Weapons Advisory Opinion*, *ibid,* n.73, para. 78.

Instead, 'the clause applies only in the absence of treaty law……..it does not act as an overarching principle that must be considered in every case.[1003] As has been demonstrated throughout the legal analyses, the three international legal disciplines applicable to AWS operations, all play a significant part in regulating the use of AWS.[1004] Indeed, the current researcher has identified a whole plethora of rules that regulate the use of AWS, almost all of which are firmly grounded in existing legal obligations. And, together, these three legal disciplines do much more than merely ensure that the principles of distinction and proportionality are adhered to, as implied by HRW. [1005]

Amongst other things, and in many cases in light of ethical concerns, the overarching body of LOAC prohibits weapons that cause superfluous injury or unnecessary suffering.[1006] They ensure, inter alia, that killings are not arbitrary in nature.[1007] Existing law also prohibits, amongst other things, the use of exploding bullets,[1008] blinding lasers,[1009] cluster munitions,[1010] and chemical weapons.[1011] In addition, for example, it prevents nations from placing nuclear weapons on celestial objects, including the moon,[1012] and, inter alia, upon the seabed.[1013]

As previously demonstrated, existing legal obligations also ensure that every targeteer is under an obligation to take precautions in attack,.[1014] Finally, as is explored in greater detail in the following chapter, military commanders must take all reasonable precautions when deploying any weapon, including an AWS.[1015] Human combatants

[1003] Schmitt, *ibid,* n.42, 32. Here, Schmitt refers to Art 1 API and notes, '[t]oday, a rich fabric of treaty law governs the legality of weapon systems. Certain of these treaties bear directly on the development of autonomous weapon systems. The restrictions on incendiary weapons, air delivered antipersonnel mines, and cluster munitions, for example, limit their employment on autonomous weapon systems by States Party to the respective treaties.'
[1004] This argument has State support, and by was forwarded, for example, by the Russian delegation to the ICJ in anticipation of the *Nuclear Weapons Advisory Opinion, ibid*, n.73.
[1005] HRW (2018), *ibid*, n.283, 14.
[1006] See e.g., Article 23(e) Hague Regulations (1899), *ibid*, n.138, *Nuclear Weapons Advisory Opinion*, *ibid,* n,73, paras. 77, 78 and 95, and, *ICRC Customary Rule 70*, *ibid,* n.518.
[1007] Art. 6 ICCPR, *ibid*, n. 602.
[1008] St. Petersburg declaration, *ibid,* 138.
[1009] Protocol IV CCW, *ibid*, n.138.
[1010] Convention on Cluster Munitions (2008) 2688 UNTS 39.
[1011] Chemical Weapons Convention, *ibid*, n.138.
[1012] Outer Space Treaty (1967) 610 UNTS 205.
[1013] Seabed Arms Control Treaty (1971) 955 UNTS 115.
[1014] See e.g., ICRC Customary Rule 15, *ibid*, n.518.
[1015] See e.g., art. 57(2) API, *ibid*, n.43. Also see generally, Grimal and Pollard (2021*), ibid,* n.4 where the concept of feasibility is considered in greater detail.

may be provided with the opportunity to delegate life and death decision making to AWS, but that does not mean that these legal provisions will cease to apply. Instead, it is much more likely that in the vast majority of AWS are deployments, the Martens clause will not need to be applied.

5.2.2.6 Autonomous Weapons Systems and The Martens Clause: In Sum.

Leading opponents of AWS argue that the Martens clause should prevent AWS deployments. Nevertheless, although the clause is steeped in moral and ethical parlance, its text is especially ambiguous. Consequently, it is open to all number of interpretations. On the one hand some believe that it should be utilised merely as reminder of the existence of CIL.[1016] On the other, it can be interpreted expansively, to mean that states must regard the principles of humanity and the dictates of public conscience at all times, given that the treaties which govern armed conflict are rarely, if ever, complete.[1017] Part 2 has demonstrated however, that the clause is applicable only in limited circumstances. Even if the wider interpretation is employed, there is still no evidence to suggest that there is anything like *overwhelming* support for an absolute prohibition. Nevertheless, the Martens clause does have limited legal connotations. Thus, the following rule is annexed,

RULE 47
Should the development and use of a new AWS appear to be unaccounted for by existing legal treaties or established custom, the Aws development and use must be consistent with the Martens Clause, and specifically, the principles of humanity and the dictates of public conscience.

5.2.3 Autonomous Weapons Systems and Article 36 of Additional Protocol I.

This section considers the development of AWS according to a second way in which the treaties introduce an ethical clause – though, it is directly related to the previous analysis. Nonetheless, in this instance, the analysis has regard of Article 36 AP I. This provides,

[1016] Ticehust*, ibid,* n.966, 1.
[1017] *Ibid.*

> 'In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party'.[1018]

This provision is another which is routinely touted as being capable of prohibiting AWS,[1019] though in this instance it relates specifically to AWS development, as opposed to AWS deployments. Although brief, the following analysis could also have been conducted in Chapter Three. However, for reasons which will become clear, the Article 36 discussion is predominantly an ethical one.

The ICRC identify that Article 36 is customary in nature, and that it is applicable to all parties. This is denied by the U.S. however, who somewhat notably have not ratified API.[1020] Somewhat relevant to the present analysis in terms of the *Template,* is the fact that the ICRC identifies that Article 36 refers to 'weapons of all types….be they, "lethal' or "non- lethal"—weapons systems'.[1021]

This provision clearly intends that states consider how their new weapons would function in accordance with the wider body of legal treaties and custom. And, if the use of an emerging technology did appear to be inconsistent with this, Article 36 appears to obligate them to stop its production, or at the very least its deployment. Therefore, it is relatively straightforward to determine, for example, that nations would be prevented developing, producing, stockpiling and use a new autonomous chemical

[1018] Article 36 API, *ibid*, n.32.
[1019] See e.g., HRW (2012), *ibid,* n.15, 21-27, HRW (2016), *ibid,* n. 312, 33-36. Also see generally, Vincent Boulanin and Maaike Verbruggen, 'Article 36 Reviews (*SIPRI*, December 2017). https://www.sipri.org/sites/default/files/2017-12/article_36_report_1712.pdf accessed 13 May 2021.
[1020] See, *ibid,* n.544. Also see, HRW (2012), *ibid*, n.15, 22.
[1021] See, International Committee of the Red Cross, 'A Guide to the Legal Review of Weapons, Means and Methods of Warfare (*ICRC*, 2006) https://www.icrc.org/en/doc/assets/files/other/irrc_864_icrc_geneva.pdf accessed 12 July 2021. Also see and for example, Boulanin and Verbruggen, *ibid,* n.1019, 3.

munition, such a weapon clearly being prohibited by the Chemical Weapons Convention (CWC).[1022]

The primary argument that arises under Article 36, however, tends not to identify individual weapons such as that considered in the previous paragraph. Rather, opponents argue instead that states developing all Aws must have regard for the Martens Clause, be it a customary obligation,[1023] or that found in Article 1 API. In other words, Article 36 requires those states developing AWS to consider the principles of humanity and the dictates of public conscience. Having conducted a thorough analysis of these concepts in the previous section, there is no need to repeat the examination here.

5.2.4 Human Dignity.

This section considers the third, and final, additional concept that is contained with the treaties which are relevant to AWS deployments – human dignity.[1024] As acknowledged by the ICJ, the human dignity of every person is '[t]he essence of the whole corpus of IHL as well as human rights law…'[1025]. Indeed, similar to the preceding sections, the ensuing dignity examination could well have taken place in a foregoing chapter. Nonetheless, despite is underlying legal connotations, human dignity is without fail an overarchingly ethical concept. That being the case, the analysis is best placed in the present chapter. The proposition that AWS deployments in some way violates human dignity is among the most frequently raised grounds for supporting *the Prohibition*.[1026] This section will demonstrate, however, that this relatively new concept is ill defined, ambiguous, and therefore, an inherently unstable platform from which to ground such discussions.

[1022] Chemical Weapons Convention, *ibid,* n.138.
[1023] As previously noted, even if this was true, the nature of the obligation is far from certain.
[1024] Hereinafter the term 'dignity' is generally used. However, Dignity, and Human Dignity should be taken as one in the same.
[1025] Furundzija, *ibid,* 310, para 183.
[1026] Adam Saxton, '(Un)Dignified Killer Robots?: The Problem with the Human Dignity Argument' (*Lawfare* March 20, 2016) < https://www.lawfareblog.com/undignified-killer-robots-problem-human-dignity-argument > accessed 15 August 2019. Also see, Grimal and Pollard (2021), *ibid,* n.4, 711-712. Here the authors present a similar discussion in regard of the combatants duty to disobey orders.

5.2.4.2 Human Dignity in the Treaties.

As previously, before moving on to consider how human dignity might impact upon AWS deployments, the concept must first be identified. In the first instance, dignity can be shown to be somewhat symbiotic with Kantian Philosophy. For example, Kant believed that humans must be treated as more than mere objects, [1027] and that human dignity is an inalienable right that is inherent that is intrinsically linked to a human moral capacity.[1028] If this is indeed the case, then compliance with dignity requires more than adherence to 'mere' positive legal obligations.

While dignity is undeniably an ethical concept, however, it is repeatedly referenced throughout the treaties which govern AWS deployments. For example, in IHL, common Article 3 of the Geneva Conventions prohibits 'outrages upon personal dignity, in particular humiliating and degrading treatment' to those persons *hors de combat*.[1029] Article 75(2)(b) API, also supplies, 'outrages upon personal dignity, in particular humiliating and degrading treatment, enforced prostitution and any form of indecent assault' are prohibited. Article 4(2) APII adds 'rape' to that non-exhaustive list.

Dignity is also referred to in a number of IHRL treaties. This includes Article 1 Universal Declaration of Human Rights (UDHR).[1030] These states, '[a]ll human beings are born free and equal in dignity and rights'. There is also reference to it in Article 22 of the same treaty.[1031] The preamble to that treaty also recognises the 'inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world'.[1032] Though it is not explicitly referred to in Article 7 International Covenant on Civil and Political Rights (ICCPR),

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[1027] See e.g., Immanuel Kant, *Groundwork of the Metaphysic of Morals*. H. J. Paton (tr.) (Harper & Row, 1964), Ariana Pop, 'Autonomous weapon systems: A threat to human dignity?' (*Humanitarian Law and Policy*, 10 April 2018), para. 3 https://blogs.icrc.org/law-and-policy/2018/04/10/autonomous-weapon-systems-a-threat-to-human-dignity/ accessed 13 July 2021.
[1028] Kant, *ibid*, 102-103 and 106-107.
[1029] Common art. 3, *ibid,* n.522
[1030] Art. 1 UDHR, *ibid,* n.727.
[1031] Art. 22 UDHR, *ibid.* This states, '[e]veryone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.'
[1032] See, preamble to UDHR, *ibid.*

the concept of dignity can be implied from the passage 'no one shall be subjected to torture or to cruel, inhumane, or degrading treatment or punishment'.[1033]

The postulation that dignity lays at the heart of IHRL is alluded to in the preambles of both the ICCPR, and the International Covenant on Economic, Social and Cultural Rights (ICESCR).[1034] Both note 'the inherent dignity…of all members of the human family'…and…'the inherent dignity of the human person'. Reference to the concept can also be found in additional IHRL instruments. This includes the preamble to the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (1984), which recognises 'the inherent dignity of the human person'.[1035] Its status is also confirmed in the preamble to the Declaration on the Elimination of all Forms of Intolerance and Discrimination Based on Religion or Belief (1981).[1036]

None of these treaties attempt to define what exactly human dignity is. Though the International Criminal Court (ICC) has identified, arguably somewhat ambiguously, that for there to be an outrage upon personal dignity, an act must humiliate, degrade or otherwise violate the dignity of one or more persons, while 'the severity of the humiliation, degradation or other violation…(should be)… of such degree as to be generally recognised as an outrage upon personal dignity'.[1037] In addition, the ICTY has noted that human dignity is the 'essence' of both IHL,[1038] and IHRL.[1039] This was also repeated by the chamber throughout *Kunarac,*[1040] where the concepts customary nature was also regularly noted.[1041]

[1033] Art. 7 ICCPR, *ibid,* n.602.
[1034] Preamble to International Covenant on Economic, Social and Cultural Rights (1966) 993 UNTS 3 (hereinafter ICESCR).
[1035] Preamble to Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (1984) 1465 UNTS 85 (hereinafter Convention Against Torture).
[1036] The Preamble to UDHR, *ibid*, n.727 opens with the sentence, 'considering one of the basic principles of the Charter of the United Nations is that of dignity and equality inherent in all human beings…'. Also see e.g., art. 8 (c)(ii), and art. 21 Rome Statute, *ibid*, n.14, The Preamble to the Convention on the Elimination of All Forms of Discrimination Against Women (1999). This similarly notes 'the charter of the United Nations reaffirms faith in fundamental human rights, in the dignity and worth of the human person and the equal rights of men and women', and the Optional Protocol to the Convention on the Elimination of All Forms of Discrimination Against Women (1999). This provides 'that the Universal Declaration of Human Rights proclaims that all human beings are born free and equal in dignity…'
[1037] Art. 8 (2)(b)(xxi) ICC statute, *ibid*, n.14.
[1038] *Furundzija Case, ibid,* n. 310, paras. 162 and 183.
[1039] *Ibid,* para. 183
[1040] *Kunarac Case*, *ibid,* n.734, para. 490.
[1041] *Ibid*, paras. 406 and 408.

5.2.4.3 Autonomous Weapons Systems and Human Dignity.

There is no doubt that as a concept, dignity is intended to play a part both in, and away from the conduct of military operations. Though clearly, the former is the subject of the present analysis. With that in mind, the remainder of this section considers whether AWS should be prohibited 'as a matter of the preservation of human morality, dignity, justice, and law'.[1042] Or, instead, whether such claims somewhat intentionally utilise an ambiguous, poorly defined term to support arguments which this thesis has consistently demonstrated to be fundamentally flawed.

The first way in which opponents argue AWS violate human dignity, is that they 'are incapable of thinking qualitatively' and, therefore, that they lack the ability to display empathy or compassion.[1043] Indeed, HRW, for example, note that '[d]ue to their lack of emotion and legal and ethical judgment, fully autonomous weapons would face significant obstacles in complying with the principles of humanity'. [1044] While there is an obvious risk of repetition here, the relevance in this instance is that HRW believe that principles of humanity requires the humane treatment of others and, a respect for human life and human dignity.[1045]

The claim that AWS lack 'mercy and compassion' has been considered and indeed discounted on several occasions. [1046] Nonetheless, for the sake of the current

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[1042] Asaro (2012), *ibid*, n.317, 709. Noting that the general thesis analysis thus far, has demonstrated that there is nothing either inherently unlawful, and/ or unjust about AWS deployments. Moreover, in addition justice can be taken to mean, (i) the upholding of rights, and the punishment of wrongs, by the law. See e.g., Mick Woodly (ed), *Osbourn's Concise Legal Dictionary*, (12th edn. Sweet and Maxwell 2013). However, an alternative definition is offered by, Oxford Dictionary, *ibid*, n.87. This states justice is also defined as: 'just behaviour or treatment'.

[1043] Adam Saxton, '(Un)Dignified Killer Robots?: The Problem with the Human Dignity Argument' (*Lawfare,* 20 March 2016) < https://www.lawfareblog.com/undignified-killer-robots-problem-human-dignity-argument > accessed 15 August 2019.

[1044] HRW (2018), *ibid*, n.283, 2, Indeed, since HRW (2015), *ibid,* n.191 HRW has consistently referred to the concept of dignity. See e.g., HRW (2018), *ibid*, 283, 26 where they state 'Fully autonomous weapons could not respect human dignity, which relates to the process behind, rather the consequences of the use of force. As machines, they could truly comprehend neither the value of individual life nor the significance of its loss', HRW (2015), *ibid*, n.191, 9. Here HRW similarly they offer that '[a]s inanimate machines, they could comprehend neither the value of individual human life nor the significance of its loss'. In the same vein see, HRW (2016), *ibid*, n.312, 20-21 providing '[f]ully autonomous weapons could also violate the principle of dignity, which is recognised in the opening words of the UDHR. As inanimate machines, fully autonomous weapons could truly comprehend neither the value of individual life nor the significance of its loss, and thus should not be allowed to make life-and-death decisions'.

[1045] *Ibid.*

[1046] Nevertheless, see e.g., Cristof Heyns, 'The Challenge of autonomous weapons systems to legal regulation', paper presented at the conference on autonomous weapons systems – Law, Ethics, Policy Academy of European Law, European University Institute, 24-25 April 2014, HRW n.101, and, Dieter

discussion, this objection could be expanded upon further without repetition. One retort to the lack of compassion claim, is that it appears somewhat unsustainable to support a line of reasoning which posits that an 'attack by a terror bomber is less cruel because the commander of the aeroplane might in principle be merciful whereas an autonomous system would not'.[1047] As noted by one contributor 'from a fundamental, intrinsic perspective, the loss of empathy, while tragic, does not necessarily render a decision inherently unjust and immoral.'[1048] Indeed, while acts of compassion may well be demonstrated in armed conflict, they typically go beyond what is morally required of our combatants.[1049]

A further way the dignity is utilised, is the argument that AWS offend a central tenant of Kantian dignity because the *equality* of the person becomes skewed when one party to the conflict is 'removed from physical risk at the same time as their targets are exposed to an increased risk'.[1050] This is perhaps the most straightforward to defend, given that there is absolutely no requirement for *fairness* in war. [1051]

As has been previously acknowledged, increasing autonomy will offer something novel insofar as weapons development is concerned. Nevertheless, in terms of the fairness of fight, or the burden of risk, there is no difference between an AWS and other weapons system. This is particularly true of over-the-horizon weapons systems such as ICBMs, and systems such remotely piloted UAV, the operator of which can fire a Hellfire

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Birnbacher, 'Are Autonomous Weapons Systems a Threat to Human Dignity?' in Nehal Bhuta, Susanne Beck *et al*. (eds.) *Autonomous Weapons Systems Law, Ethics, Policy* (Cambridge University Press, 2016), 120-121.

[1047] Birnbacher, *ibid,* 121.

[1048] Saxton, *ibid,* n.1043.

[1049] *Ibid*.

[1050] Amanda Sharkey, 'Autonomous Weapons Systems, Killer Robots and Human Dignity', (2019) 21 (2) Ethics and Information Technology 75, 78. See also, Ozlem Ulgen, 'Human Dignity in an Age of Autonomous Weapons: Are We in Danger of Losing an 'Elementary Consideration of Humanity'?' (2016) 8(9) ESIL Conference Paper Series 1-19 European Society of International Law (ESIL), Annual Conference (Riga). (ESIL, January 31 2017) https://www.researchgate.net/profile/Ozlem_Ulgen/publication/331012788_Human_Dignity_in_an_Age_of_Autonomous_Weapons_Are_We_in_Danger_of_Losing_an_%27Elementary_Consideration_of_Humanity%27_Updated_version_2019/links/5c613fde92851c48a9c98838/Human-Dignity-in-an-Age-of-Autonomous-Weapons-Are-We-in-Danger-of-Losing-an-Elementary-Consideration-of-Humanity-Updated-version-2019.pdf accessed 7 January 2021.

[1051] The Hauge Declarations (1899) and (1907), *ibid,* n.138 did attempt to prohibit balloon delivered projectiles and aerial bombardment respectively. However, the motivation for these treaties was civilian protection as opposed to fairness of fight. Moreover, ultimately these limitations were either short lived (in relation to the balloon treaty), or they failed in their entirely. For a useful discussion see, Scharre, *ibid,* n.20, 331-345.

missile at a great distance from the battlefield. In short, war is not, has rarely been, and does not need to be 'fair'.[1052]

A third, and final independent dignity-based argument is grounded more rigidly in Kantian ethics, and regards dignity as a human right. Christof Heyns, [1053] for example, provides that, '[d]ignity, at least in the Kantian tradition, advances the idea of the infinite or incommensurable value of each person'. [1054] According to Heyns, a machine that decides who lives and who dies based upon an algorithmic code, treats a combatant not as a human being, but merely as a target.[1055] As a result, an AWS cannot operate in accordance with dignity, because a humans special status means that they 'deserve to meet a different fate'.[1056]

Similarly, others offer that 'human beings are rational natures and possess the capacity to recognise universal moral principles and act in conformity with them.'[1057] This is what Kant refers to as the 'autonomy of the will'.[1058] And, in this respect, Kantian autonomy requires that humans should be treated as more than mere objects.[1059] This

[1052] See generally e.g., Scharre, *ibid*, and Kenneth Anderson Matthew C. Waxman 'Law and ethics for Autonomous Weapons Systems: Why a Ban Won't Work and How the Law of War Can'(2013) American University Washington College of Law Research Paper No. 2013-11, Columbia Public Law Research Paper < http://ssrn.com/abstract=2250126 > accessed 22 August 2019. At pp.8 the authors note, '[a] core objection, then as now, was that they disrupted the prevailing norms of warfare by radically and illegitimately reducing combat risk to the party using them—an objection to "remoteness," joined to a claim (sometimes ethical, sometimes legal, and sometimes almost aesthetic) that it is unfair, dishonourable, cowardly, or not sporting to attack from a safe distance, whether with aircraft, submarines, or, today, a cruise missile, drone, or conceivably an autonomous weapon operating on its own. The law, to be sure, makes no requirement that sides limit themselves to the weapons available to the other side, weapons superiority is perfectly lawful and indeed assumed as part of military necessity.'
[1053] Heyns is a (former) Special Rapporteur on extrajudicial, summary or arbitrary executions for the United Nations. He also forwards the concept of a right to a dignified life. Christof Heyns, Autonomous Weapons Systems: Living a Dignified Life and Dying a Dignified Death, in Nehal Bhuta, Susanne Beck *et al*. (eds.) *Autonomous Weapons Systems: Law, Ethics, policy*, 10.
[1054] *Ibid*, 11.
[1055] *Ibid.*
[1056] *Ibid.*
[1057] Pop, *ibid*, n.1027.
[1058] *Ibid,* in turn citing, Kant, *ibid*, n.1027, 4:433. See also e.g., Immanuel Kant, *Groundwork for the metaphysics of morals*, edited and translated by Allen W. Wood with essays by J. B. Schneewind *et al*. *Rethinking the Western Tradition* (Yale University Press, 2002), 51.
[1059] A. Pop, *ibid,* n.1027, para. 4. Also see, Aaron M. Johnson & Sidney Axinn, 'The Morality of Autonomous Robots' (2013) 12:2 Journal of Military Ethics, 129, and, Horowitz, *ibid*, n.196, 31-32. Here the author notes, one view is that 'all human life is precious and has intrinsic value, so having machines select and engage targets arguably violates human dignity'.

argument therefore holds that dignity is related to *value*.[1060] Noting that this should be seen as an 'inner worth', rather than a relative worth, or price.[1061]

An alternative way of considering the 'more than objects' argument, however, is that human dignity relates to *status*.[1062] And, arguably, this is where the historical roots of the concept lay – in that status would have traditionally arisen from office, rank, or privilege. [1063] The contemporary view of status forwards the proposition that *humankind* has a higher status than that which surrounds it.[1064]

In the first instance, and similar to the previous discussion regarding 'fairness', it is difficult to fathom exactly why AWS specifically, would offend dignity as a *value,* whereas killing with a UAV or ICBM would not. [1065] Indeed, Horowitz somewhat pragmatically asks, 'is it really less dignified to be shot and killed instantly by an AWS than it is to be set on fire, bludgeoned to death, or killed by a cruise missile?'[1066] The point is that even if the dignity as a value argument is the correct interpretation, it is an unsustainable, and uncompelling argument when applied in respect of AWS alone.[1067]

The second interpretation regarding dignity as a *status*, is also somewhat perplexing. This is primarily because, for the *status* argument to work, then humankind would have to justify its reasoning that it has a higher status over and above that of autonomous systems.[1068] And, even if that was possible, dignity must also be offended wherever a human is killed by any 'weapon' with a lower *status*.[1069] However, this is not a line of reasoning that it forwarded by opponents. A useful demonstration as to why the status argument must fail, does not need to utilise weapons at all, but instead all 'beings' of lower status, including animals, bacteria and viruses such as Covid-19. Indeed, have all been responsible for killing humans, regularly, and as we have experienced in recent

[1060] See, Pop, i*bid*, n.1027, paras. 5 and 10-14.
[1061] *Ibid,* para. 12.
[1062] *Ibid,* paras.15-17.
[1063] See generally e.g., Jeremy Waldron, 'How Law Protects Dignity' (2012) 71(1) Cambridge Law Journal, 200.
[1064] *Ibid.*
[1065] Pop, *ibid,* n.1027, para. 20.
[1066] Horowitz, *ibid,* n.196, 32.
[1067] Sharkey, *ibid,* n.1050, 84.
[1068] Pop, *ibid,* n.1027, para.22-24.
[1069] *Ibid.*

years, often in incredibly large numbers. They are certainly not prevented from killing because of a lesser status.

5.2.4.4 Autonomous Weapons Systems and Human Dignity: In Sum.

This section has identified three primary arguments that oppose AWS, and which are grounded in the concept of human dignity. These are, the claim that AWS lack a sense of moral judgement, the Kantian notion of the equality of person – specifically in relation to a fair distribution of the burden of risk, and the additional Kantian notion that humankind must be considered as having a higher value and/ or status. Nevertheless, none of those arguments considered are capable of supporting a ban on a weapons technology that may have positive strategic and humanitarian advantages because while the treaties seek to ensure that dignity is considered a 'touchstone of ethics, no one knows what it is'.[1070] Instead, dignity is consistently framed 'in an unspecific way' of referring to morality as a whole.[1071] However, this may eventually weaken opposition arguments to AWS, as an over-reliance upon it, risks undermining the credibility of the entire opposition debate.[1072]

PART 3 Are Autonomous Weapons Systems Inherently Evil?

Introduction

Chapter Five has thus far considered AWS deployments according first, to the classical theory which is best placed to assess the morality of autonomous shows of force, and second, to the ethical concepts that are contained within the relevant treaties. In each case, the researcher has demonstrated that AWS cannot, in themselves, be identified as a uniquely immoral or unethical method of conducting warfare. This final part of Chapter Five is different. It does not look to the treaties, or custom. Instead, it has regard of the alternative argument that AWS must be prohibited, simply because there is something morally unacceptable about removing the human from the OODA loop.[1073] The following analysis demonstrates that this final ethical argument may yet

[1070] See e.g., Replying to Pop's analysis by Peter Asaro (10 April 2018) at pop, *ibid*, 'comments'. Here, Asaro supplies, while a definition of human dignity does exist, he along with his fellow scholars have yet to articulate it. Also see, Jenkins, *ibid,* n.113, 19.
[1071] Birnbacher, *ibid,* n.1046, 111.
[1072] Pop, *ibid,* n.1027, para. 26
[1073] Anderson and Waxman, *ibid,* n.1052, 15.

prevent future AWS deployments. However, it also identifies that it should not be relied upon until opponents are able to ground their discussions in something much more tangible than is presently on offer.

5.3.2 What is *Mala in se*?

In criminal law, the term *mala in se* is used to refer to a wrong that is iniquitous, such as murder.[1074] This can be contrasted, and distinguished, from the *mala prohibita* - those crimes that are unlawful merely because they are prohibited, such as speeding.[1075] The following analysis examines the claim of leading ethicist Professor Robert Sparrow. Sparrow is an intrinsic figure in the debate regarding AWS, [1076] and a founding member of the International Committee for Robot Arms Control (ICRAC).[1077] And, he has argued that regardless of whether an AWS can be used in adherence with legal norms, they should nevertheless be prohibited, because they are quite simply, and inherently, *evil*.[1078]

[1074] See e.g., Osbourn's Dictionary, *ibid,* n.1042, 269. Here, it states '*Mala in se* acts which are wrong in themselves, such as murder, as opposed to *mala prohibita*, acts which are merely prohibited by law, e.g., smuggling.' The literal translation of *mala in se* is, wrong (or evil) in itself. Also see, 'Malum in se' Merriam-Webster.com Legal Dictionary, (*Merriam-Webster*) https://www.merriam-webster.com/legal/malum%20in%20se accessed 8 January 2021, and, 'mala in se', (*Legal Dictionary*, 23 June 2017) https://legaldictionary.net/mala-in-se/ accessed 8 January 2021.

[1075] *Ibid.*

[1076] See, Sparrow, *ibid,* n.15. This essay is largely focused upon accountability - as such it is considered in greater detail in the following chapter. A further 2009 piece from the same author offers AWS would lower the threshold of war, see, Robert Sparrow, 'Predators or plowshares?: Arms Control of Robotic Weapons' (2009) 28:1 Technology and Society magazine, IEEE, 25 < http://sevenhorizons.org/wp-content/uploads/2015/04/SparrowPredatorsorPlowshares.pdf > accessed 19 August 2019.

[1077] As such, Professor Sparrow was one of the first individuals who sought to bring AWS, and military robotics generally, to the attention of the wider public audience, and one of the first individuals to coin the term Killer Robots. See, Sparrow, *ibid,* n.15. The founding of ICRAC was also, for example, three years in advance of HRW (2012), *ibid*, n. 15. As discussed, this was in reality the first time AWS were considered in the public domain. ICRAC's members are, Noel Sharkey, Jürgen Altmann, and Peter M. Asaro – all prominent scholars. And, their present mission statement reads, 'Given the rapid pace of development of military robotics and the pressing dangers that these pose to peace and international security and to civilians in war, we call upon the international community to urgently commence a discussion about an arms control regime to reduce the threat posed by these systems. We propose that this discussion should consider the following: Their potential to lower the threshold of armed conflict, The prohibition of the development, deployment and use of armed autonomous unmanned systems, machines should not be allowed to make the decision to kill people, Limitations on the range and weapons carried by "man in the loop" unmanned systems and on their deployment in postures threatening to other states, A ban on arming unmanned systems with nuclear weapons, The prohibition of the development, deployment and use of robot space weapons.' < https://www.icrac.net/about-icrac/> accessed 19 August 2019.

[1077] Sparrow, *ibid,* n.579, 94. Here the author references the fact that there are clear difficulties in attempting to define the entire spectrum of AWS, and that as a consequence, the literature is 'vexed'.

[1078] *Ibid,* 110-111.

5.3.2.2 Autonomous Weapons Systems and the concept of *mala in se*.

Sparrow has previously argued against AWS deployments on a number of occasions.[1079] And, he has also previously supported the view that AWS cannot be used in adherence with the principles of international law which govern their use.[1080] Nevertheless, he provides this latter reasoning because, in line with the present researchers hypothesis, 'the ethical case for allowing autonomous targeting, at least in specific restricted domains, is stronger than critics have typically acknowledged'.[1081] The claim that the removal of humans for the OODA loop is a manifestation of evil in itself, could yet be pivotal in the matter of whether states do accede to a prohibitive treaty.[1082] However, if states are going to agree to forfeit the various benefits offered by AWS, including the strategic, arguments such as Sparrows must be substantiated in fact, and not merely upon speculation, and conceptual presuppositions.

In the first instance, Sparrow recognises that to give his argument 'teeth', he is calling, somewhat perplexingly, for the codification of concept that goes way beyond positive law.[1083] He claims that this is, nevertheless, entirely permissible given that 'many people have the intuition that there is something morally problematic about robots killing people'.[1084] One immediate problem with this assertion however, is that the Part 2 analysis has already explicitly demonstrated that neither public, or expert, opinion is overwhelmingly, and positively, in favour of prohibiting AWS. Consequently, it is somewhat of a stretch to suggest that the *mala in se* argument is etched in societies collective conscious in the same way as abhorrent crimes such as rape and murder. In contrast to Sparrow's assertions, therefore, this divide of opinion would instead suggest that this ethical concept could not simply be absorbed into law without at least some opposition.

[1079] *Ibid.*
[1080] Sparrows contributions have always been largely focused upon the ethical implications of AWS deployments. However, his association with ICRAC means that his discussions are also generally aligned with the notion that AWS offend the core principles of international law. For example, ICRAC are one of a number of NGO's who support the campaign 'stop the killer robots' who, as previously discussed, state that '[f]ully autonomous weapons would lack the human judgment necessary to evaluate the proportionality of an attack, distinguish civilian from combatant, and abide by other core principles of the laws of war'. See, < https://www.stopkillerrobots.org/learn/#problem > accessed 19 August 2019.
[1081] Sparrow, *ibid,* n.579, 93.
[1082] Once again noting that this thesis has consistently demonstrated that international law does not prohibit AWS deployments in all circumstances.
[1083] Sparrow, *ibid,* n.579, 111.
[1084] *Ibid,* 95.

As previously noted, public opinion can at best be described as bifurcated. Moreover, it is also very likely to evolve as AI becomes more prevalent within general society.[1085] If, in the future, it became clear that AWS deployments *did* directly corresponded to a reduction in battlefield casualties, public opinion might demand that AWS are utilised where possible.[1086] Moreover, as the author has identified elsewhere,[1087] if an AWS exists, and its use would reduce civilian casualties when compared to a conventional method or means of warfare, the commander could be lawfully obliged to use the AWS.[1088]

Sparrow does ground his discussion on a little more than merely his gut feeling. A second line of reasoning he introduces is that AWS 'violate the requirement of respect for the humanity of our enemies, which underlies the principles of the *jus in bello*.'[1089] He argues that the IHL 'requirement to respect' is grounded in the interpersonal relationship.[1090] According to Sparrow, this relationship is central to functioning of IHL because it requires for a human to be involved in all distinction and proportionality assessments.[1091] In other words, although AWS may not *directly* offend the core principles of IHL, they should nevertheless be resisted due to the fact IHL *indirectly* objects their use. Distinction and proportionality assessments are, according to sparrow charged with a variety of 'morally relevant features'. [1092] He notes that essentially, the

[1085] Anderson and Waxman, *ibid*, n.1052, 16. Here the authors offer to the suggestion that AWS are simply wrong, 'is a difficult argument to address, since it stops with a moral principle that one either accepts or does not accept. Whatever merit it has today, one must consider that in the foreseeable future we will be turning over more and more functions with life-or-death implications to machines—such as driverless cars or automatic robot surgery technologies—not simply because they are more convenient but because they prove to be safer, and our basic notions about machine and human decision-making will evolve.'

[1086] See e.g., Ryan Jenkins and Duncan Purves, 'Robots and Respect: A Response to Robert Sparrow' (2016) 30 Ethics & International Affairs, 391.

[1087] Generally, Grimal and Pollard (2021), *ibid*, n.4.

[1088] See, Art. 57 API, *ibid*, n.43. Regarding precautions in attack it states, '(1). In the conduct of military operations, constant care shall be taken to spare the civilian population, civilians and civilian objects. (2). With respect to attacks, the following precautions shall be taken: (a) those who plan or decide upon an attack shall: (i) do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives within the meaning of paragraph 2 of Article 52 and that it is not prohibited by the provisions of this Protocol to attack them, (ii) take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects…'

[1089] Sparrow, *ibid,* n.579, 110.

[1090] *Ibid*, 106. Here, Sparrow identifies the work of Thomas Nagel, who again supports Kantian philosophical ideals, which require all of humankind to respect the 'moral humanity of those involved in war'. See generally, Thomas Nagel, 'War and Massacre' (1972) 2 Philosophy & Public Affairs, 1.

[1091] Sparrow, *ibid,* n.579, *107.*

[1092] *Ibid.*

relationship must be seen as being 'between agents—in-deed, between members of the Kantian "kingdom of ends."'[1093] In short, when an AWS *decides* to launch an attack, the interpersonal relationship is missing.

As has so often been the case, however, even if this were the case the exact same argument could be applied to a number of other methods of warfare.[1094] Indeed, having introduced this line of reasoning, Sparrow himself, identifies the lack of the interpersonal relationship is missing when weapons such as cruise missiles and anti-personnel land mines are utilised.[1095] Nevertheless, further weaknesses in the interpersonal relationship argument can be demonstrated by looking outside of the battlefield to alternative civilian autonomous robots.

Certainly, if the lack of the ethical interpersonal relationship prevented the use of an AWS, then it must also prevent the use of other fully autonomous systems. Of course, not all of these will be required to make life-or-death decisions, but for a few, not least autonomous vehicles, this will almost certainly be required. Humankind does not instinctively know that these types of machines are inherently evil, or disrespectful. Consequently, autonomous vehicle manufacturers receive substantial state support for research and development because autonomous vehicles will save thousands of lives.[1096] In much the same way, when AWS reach a point where they are significantly more capable of adhering to the principles of IHL than human combatants, they will not be seen as ethically repulsive. Instead, they are likely to be seen as morally required.[1097]

5.3.3 Are Autonomous Weapons Systems Inherently Evil? In sum.

The argument considered in Part 3, is that which posits humanity simply knows that it would be wrong to allow machines to make lethal decisions. Even if true, however, an

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[1093] *Ibid,* 107

[1094] Jenkins and Purves, *ibid*, n.1086. In summary the authors note '[w]e argue that this distinction between AWS and widely accepted weapons is illusory, and so cannot ground a moral difference between AWS and existing methods of waging war.'

[1095] *Ibid.*

[1096] See e.g., Peter Margulies, 'Making Autonomous Weapons Accountable: Command Responsibility for Computer-Guided Lethal Force in Armed Conflicts' in Jens David Ohlin (ed.) *Research Handbook on Remote Warfare* (Edward Elgar Press 2016), 406. Here the author notes, driverless cars are 'a means to reduce the havoc and mayhem caused by human error'. Also see, 'Automated Vehicles for Safety' (*National Highway Traffic Safety Administration, United States Department of Transportation)* https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety accessed 13 July 2021.

[1097] Yoo, *ibid*, n.36, 469.

alternative segment of society acknowledges that AWS may become more capable of adhering to legal principles. Thus, this alone cannot support the call for a prohibition. An additional *mala in se* argument considered that minus the ability to create interpersonal relationships, an AWS cannot show respect to those individuals it targets – which, it is argued, is *indirectly* required by IHL. Of course, as previous analyses have demonstrated, not all AWS will be lethal, and not all will target humans. Presumably, there are, therefore, certain AWS deployments to which Sparrow and others would not object. Nevertheless, the *mala in se* argument is fundamentally impaired because it cannot be uniquely applied to AWS. Indeed, as general moral principle, it promises to raise significant difficulties for robotic systems far beyond weaponry'.[1098] Regardless of whether an AWS can be said to have moral agency, the correct approach to AWS deployments is to ensure that they adhere to those legal principles previously considered. [1099]

PART 4 Chapter Conclusion.

The purpose of this chapter has been to examine whether ethics should prevent AWS deployments where international law does not. The analysis began by considering the six principles of *JWT*, and the 'wider' question of whether it would be *unjust* to use an AWS instead of a non-autonomous system. The analysis produced no evidence to suggest that *JWT* disrupt the general thesis hypothesis that AWS deployments should be regulated rather than restricted altogether. A second way in which Chapter Five assessed the ethical implications of AWS deployments, was by returning to the previously examined legal treaties. To this end, Part 2 identified the Marten's clause, Article 36 API, and the concept of human dignity.

In the first instance, even if it was applicable in all circumstances, which is doubtful, the Martens clause's 'principles of humanity' and 'dictates of public conscious' are too ambiguous to be used as a method for preventing AWS deployments. Moreover, there is nothing like *overwhelming* support for an absolute prohibition. Article 36 was shown to be inexplicability linked to the former investigation. And those arguments grounded

[1098] *Ibid.*
[1099] Anderson and Waxman, *ibid,* n.1052, 16.

in dignity were also found to be ambiguous, unsubstantiated, and possibly even detrimental to the overarching opposition argument.

Finally, Chapter Five considered whether AWS should be seen as evil in themselves, because there is something inherently wrong with robots making decision about who lives and who dies. The primary reason this final opposition argument fails, however, is that it would prevent a great deal of non-autonomous weapons deployments, and also the introduction of future civilian technologies which will undoubtably save human lives.

The field of ethics may yet have an important role to play in the discussions regarding AWS - and may even provide the grounds for implementing a prohibitive treaty. However, for this to happen opponents of AWS need to identify a much more solid ethical grounds than those considered. In other words, if the potential for a more accurate, less destructive means of warfare is to be denied to those whose lives might be saved as a result of their introduction, then it must be done on more than just a hunch.

CHAPTER 6 ACCOUNTABILITY OF AUTONOMOUS WEAPONS SYSTEMS.

Chapter Introduction.

Thus far, the researcher has conducted individual examinations of Autonomous Weapons Systems (AWS) according to the three international legal regimes that are applicable to their deployments, and to the potentially more expansive discipline of ethics. With the support of the thesis' unique classification tool, the *Template*, these analyses have consistently demonstrated that AWS deployments cannot be identified as inherently unlawful, immoral, or unethical. The final and concluding trajectory of this discussion is one which many observers believe is the 'most serious concern' raised by AWS.[1100] It is the claim that due to their uniquely autonomous nature, there will be instances where it will not be possible to identify a human that can be held legally accountable for the human suffering that AWS will inevitably cause.[1101] If this is true, there could be ramifications in both law and ethics—meaning that accountability may be a central factor in determining whether AWS should be prohibited.

PART 1. Accountability of Autonomous Weapons Systems Under International Law.

The following section examines one of the oldest arguments in opposition to AWS.[1102] This is the suggestion, that in certain circumstances, it will be impossible to identify an individual who can be held to account for war crimes committed by AWS. According to opponents of AWS, a so-called 'accountability gap' arises when AWS are deployed because of their unique ability to choose how they perform any given task. [1103] Such opponents argue that this would breach international law, and, consequently, that AWS

[1100] Jenkins, *ibid,* n.286, 120. See also, Margulies, *ibid*, n.1096, 440. Here the author offers accountability is the most salient challenge facing AWS. See also, Tim McFarland and Tim McCormack, 'Mind the Gap: Can Developers of Autonomous Weapons Systems be Liable for War Crimes?' (2014) 90 Int'l L Stud Ser US Naval War Col [i], 361, 362. Here the author discussion opens with '[f]ew aspects of the emergence of autonomous weapons systems engender divergence of opinion as dramatically as questions of accountability for violations of the law of armed conflict.'

[1101] HRW (2015), *ibid,* n.191, 1.

[1102] Note that the issue of accountability, or perceived lack of, is central to Robert Sparrow's original AWS essay. See generally, Sparrow, *ibid*, n.15.

[1103] See e.g., HRW (2015), *ibid*, n.191, 4 and 19-25, Crootof, *ibid,* n.5, 1366. Noting this has also been referred to as a 'responsibility gap'. See e.g., Jenkins, *ibid,* n.286, 120.

must be prohibited. Part 1 therefore first identifies the basis of the opposition claim that international law requires individual accountability. It does so, however, before going on to demonstrate that, in fact, no such requirement exists.

6.1.2 Identifying the Requirement for Accountability in International Law.

The suggestion that there will be an accountability gap is one of the earliest, and perhaps one of the strongest arguments in opposition to the development and use of AWS.[1104] Ever since Robert Sparrow's pioneering article in 2007, these objections have resurfaced time and again.[1105] Consequently, there is a great deal of discussion in this area. While some choose to concentrate upon specific elements of the accountability discussion,[1106] others adopt a more generalised approach.[1107] And, as has been the case on numerous previous occasions, Human Rights Watch (HRW) offer the most comprehensive summary of the contentious accountability issues. [1108]

According to HRW, there are several obstacles in the way of assigning personal accountability for the unlawful actions of an AWS.[1109] This accountability, the report claims, is required by both International Humanitarian Law (IHL) and International Human Rights Law (IHRL).[1110] HRW claim that under IHL, the obligation arises from Article 146 of Geneva Convention IV,[1111] and from Articles 85 and 86 Additional

[1104] Sparrow .
[1105] The issue of accountability, or alleged lack of is a consistent argument in all HRW Reports. However, in particular, see generally, HRW (2015), *ibid,* n.191.
[1106] See generally e.g., Jens D. Ohlin, 'The Combatant's Stance: Autonomous Weapons on the Battlefield' (2016) 92 Int'l L. Stud. 1, and Crootof, *ibid,* n.284. The two authors focus their discussions on the concept of reckless in international criminal law, and in international torts respectively.
[1107] See generally e.g., Amos N. Guiora, 'Accountability and Decision Making an Autonomous Warfare: Who Is Responsible?' (2017) 393 Utah L. Rev. 393, Tetyana Krupiy, 'Unravelling Power Dynamics in Organizations: An Accountability Framework for Crimes Triggered by Lethal Autonomous Weapons Systems' (2017) 15 Loy U. Chi. Int'l. L. Rev., 1
[1108] HRW (2015), *ibid,* 191. Noting that this report plays a central part in the analysis contained in Chapter Six.
[1109] See e.g., HRW (2015), *ibid,* n.191,1,12, 27, 38, 40 and 42.
[1110] *Ibid,* 15.
[1111] *Ibid.* Art. 146 of GCIV, *ibid,* 512 states, 'The High Contracting Parties undertake to enact any legislation necessary to provide effective penal sanctions for persons committing, or ordering to be committed, any of the grave breaches of the present Convention defined in the following Article. Each High Contracting Party shall be under the obligation to search for persons alleged to have committed, or to have ordered to be committed, such grave breaches, and shall bring such persons, regardless of their nationality, before its own courts. It may also, if it prefers, and in accordance with the provisions of its own legislation, hand such persons over for trial to another High Contracting Party concerned, provided such High Contracting Party has made out a prima facie case. Each High Contracting Party shall take measures necessary for the suppression of all acts contrary to the provisions of the present Convention other than the grave breaches defined in the following Article. In all circumstances, the accused persons shall benefit by safeguards of proper trial and defence, which shall not be less favourable than those

Protocol I (API).[1112] *Prima facie*, these provisions do appear to require states to ensure that individuals who are responsible for committing war crimes are prosecuted. Moreover, HRW also correctly identifies that under IHRL, States are obliged to find an effective legal remedy to individuals whose human 'rights' have been violated.[1113]

provided by Article 105 and those following of the Geneva Convention relative to the Treatment of Prisoners of War of August 12, 1949.'

[1112] HRW (2015), *ibid*, n.191, 15. Art. 85 API, *ibid*, n.43 states: '1. The provisions of the Conventions relating to the repression of breaches and grave breaches, supplemented by this Section, shall apply to the repression of breaches and grave breaches of this Protocol. 2. Acts described as grave breaches in the Conventions are grave breaches of this Protocol if committed against persons in the power of an adverse Party protected by Articles 44, 45 and 73 of this Protocol, or against the wounded, sick and shipwrecked of the adverse Party who are protected by this Protocol, or against those medical or religious personnel, medical units or medical transports which are under the control of the adverse Party and are protected by this Protocol. 3. In addition to the grave breaches defined in Article 11, the following acts shall be regarded as grave breaches of this Protocol, when committed willfully, in violation of the relevant provisions of this Protocol, and causing death or serious injury to body or health: (a) making the civilian population or individual civilians the object of attack, (b) launching an indiscriminate attack affecting the civilian population or civilian objects in the knowledge that such attack will cause excessive loss of life, injury to civilians or damage to civilian objects, as defined in Article 57, paragraph 2 (a) (iii), (c) launching an attack against works or installations containing dangerous forces in the knowledge that such attack will cause excessive loss of life, injury to civilians or damage to civilian objects, as defined in Article 57, paragraph 2 (a) (iii), (d) making non-defended localities and demilitarized zones the object of attack, (e) making a person the object of attack in the knowledge that he is ' hors de combat ', (f) the perfidious use, in violation of Article 37, of the distinctive emblem of the red cross, red crescent or red lion and sun or of other protective signs recognized by the Conventions or this Protocol. 4. In addition to the grave breaches defined in the preceding paragraphs and in the Conventions, the following shall be regarded as grave breaches of this Protocol, when committed willfully and in violation of the Conventions or the Protocol: (a) the transfer by the Occupying Power of parts of its own civilian population into the territory it occupies, or the deportation or transfer of all or parts of the population of the occupied territory within or outside this territory, in violation of Article 49 of the Fourth Convention, (b) unjustifiable delay in the repatriation of prisoners of war or civilians, (c) practices of ' apartheid ' and other inhuman and degrading practices involving outrages upon personal dignity, based on racial discrimination, (d) making the clearly-recognized historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples and to which special protection has been given by special arrangement, for example, within the framework of a competent international organization, the object of attack, causing as a result extensive destruction thereof, where there is no evidence of the violation by the adverse Party of Article 53, sub-paragraph (b), and when such historic monuments, works of art and places of worship are not located in the immediate proximity of military objectives, (e) depriving a person protected by the Conventions or referred to in paragraph 2 of this Article of the rights of fair and regular trial. 5. Without prejudice to the application of the Conventions and of this Protocol, grave breaches of these instruments shall be regarded as war crimes'. And, in turn, art. 86 that, 'Failure to act, '1. The High Contracting Parties and the Parties to the conflict shall repress grave breaches, and take measures necessary to suppress all other breaches, of the Conventions or of this Protocol which result from a failure to act when under a duty to do so. 2. The fact that a breach of the Conventions or of this Protocol was committed by a subordinate does not absolve his superiors from penal or disciplinary responsibility, as the case may be, if they knew, or had information which should have enabled them to conclude in the circumstances at the time, that he was committing or was going to commit such a breach and if they did not take all feasible measures within their power to prevent or repress the breach.'

[1113] HRW 2015, *ibid,* n.191 notes in particular art. 2(3) ICCPR, *ibid*, n.602. This provides that 'to ensure any person whose rights or freedoms as herein recognized are violated shall have an effective remedy, notwithstanding that the violation has been committed by persons acting in an official capacity'. At pp.33 HRW provide examples of other similar provisions which arise under international law, such as art. 8 UDHR, *ibid*, n.727. They also highlight regional Human Rights Treaties such as, art. 7(1) African

HRW go on state that '[t]he purpose of assigning criminal responsibility is to deter future violations and to provide retribution to victims',[1114] and that compensatory justice should be seen a third *role* of criminal law, though 'not a substitute for deterrence and retribution'.[1115] Indeed, HRW (2015) places a significant emphasis on the claim that criminal law is intended to *punish* wrongdoers, while also identifying that the punishment of wrongs deters future violations.[1116]

According to HRW, therefore, international law 'mandates prosecution of individuals for serious violations of the law, notably genocide and crimes against humanity.'[1117] In addition to those provisions identified above, HRW highlight 'the Basic Principles and Guidelines adopted by the United Nations in 2005,[1118]which also acknowledge the importance of accountability,[1119] although it is important to note that this is not a legally binding instrument.[1120] Nevertheless, HRW identify that criminal proceedings should be raised at the International Criminal Court (ICC).[1121]

6.1.3 The Alleged Accountability Gap.

HRW do refer to the concept of *command responsibility*. In short, this is intended to ensure that, where appropriate, a commander, or other superior, can be held to account for the actions of their subordinates. The present researcher does believe that *command responsibility* can be utilised to ensure that individuals can be held accountable for crimes that are committed by an AWS. This is considered in greater detail by the

Charter on Human and Peoples Rights, art. 25, American Convention on Human Rights, and, art. 13 ECHR, *ibid*, n.821.

[1114] HRW (2015), *ibid, n.191,* 13-15.

[1115] *Ibid,* 15.

[1116] *Ibid,* 18.

[1117] *Ibid,* 16.

[1118] UN General Assembly "Basic Principles and Guidelines on the Right to a Remedy and Reparation for victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law" (2005 Basic Principles and Guidelines), Resolution 60/47, March 21, 2006.

[1119] HRW (2015), *ibid,* n.191, 13.

[1120] The ICJ has repeatedly identified the recommendatory nature of UN Resolutions. See generally, Ellen Desmet, 'The UN Basic Principles and Guidelines on the Right to a Remedy and Reparation : A landmark or Window - dressing? An Analysis With Special Attention to the Situation of Indigenous Peoples' (2008) 24 1 South African Journal on Human Rights, 71.

[1121] It should be noted that the ICC was created by the Rome Statute, *ibid,* n.14. And states party to that statute acknowledge the jurisdiction of the Court. Perhaps the most notable absences are the U.S. and Russia, who were both originally signatories, but who later withdrew from the statute. China is also a non-signatory. This jurisdiction covers *ad hoc* tribunals such as the International Criminal Tribunal for the Former Yugoslavia (ICTY), and The International Criminal Tribunal for Rwanda (ICTR) established by UN Security Council Resolution 955 (November 8, 1994), and UN Security Council Resolution 827 (25 May1993) respectively.

researcher below. However, according to HRW, the concept is limited in this regard. HRW suggest this is the case because *command responsibility* can only be applied to instances where a commander fails to take *reasonable* measures to prevent or punish a subordinates' crimes - once they either know of it, or should have known of it. The point HRW are keen to make, and it one which the present researcher agrees with, is that that a commander is unlikely know in advance that an AWS is going to commit a war crime.[1122]

HRW go on to argue that there must be a *direct responsibility* for applications of force if an individual is to be held accountable. [1123] This may be assigned to the person who is responsible for 'squeezing the trigger' or 'pushing the button', but it can also be applied to a person who 'planned or ordered a crime'. [1124] They believe *direct responsibility* cannot be applied to AWS for three primary reasons. In short, these are, (i) that an AWS cannot fulfil the *mens rea* element that is required by criminal law, (ii) that an AWS is not a 'natural person' in the eyes of the law,[1125] and, (iii) that AWS cannot experience suffering, and/ or punishment. As previously noted, HRW believe that the latter is a key purpose of criminal law. And, when the three are considered holistically, they claim to have identified 'a novel accountability gap…[whereby those authorizing AWS deployments]…could not be held directly responsible for a criminal action..' that are committed by an AWS.[1126]

6.1.4 The Accountability Illusion.

The previous section identified, that according to HRW, international law requires that an individual must be held accountable each time a war crime is commissioned and/ or committed. And, due to their unique nature, an AWS may behave in such a way that was not fully anticipated by a commander. For example, an AWS may 'choose' to directly target the civilian population, which would constitute a grave breach of API.[1127] HRW argue that a commander could not be *directly responsible* where they

[1122] See e.g., HRW (2015), *ibid,* n.191, 21-22.
[1123] *Ibid,* 19.
[1124] *Ibid.*
[1125] In other words, AWS themselves could not be charged because they are outside of the jurisdiction of international criminal courts and tribunals.
[1126] *Ibid.*
[1127] See, art. 85(3)(a) API, *ibid,* n.43.

did not *order* such an unlawful attack.[1128] And, therefore, that AWS must be prohibited because the accountability which is lawfully required cannot be assigned.

Nevertheless, HRW's greatest flaw is that they 'confuse the issue of personal accountability with the legality of a weapons system itself.'[1129] This distinction is vital. International law, and specifically IHL, does place a number of obligations upon states regarding the use of a particular weapons system.[1130] And, in some cases, it even prohibits the use of certain weapons types altogether.[1131] However, 'no prohibition conditions legality on the ability to assign blame to a specific individual.'[1132] Indeed, international law does not seek, and had never sought, to prohibit a weapon based exclusively upon whether or not someone can be assigned with accountability for its use.

As a consequence, HRW 'wrongly conflates the imperative under international law to investigate and prosecute "grave breaches" with the separate issue of the legality of a particular weapon'.[1133] This must be the case, because if the HRW logic is followed through to its natural conclusion, accountability is an issue that arises with all types of weapons systems, not just the autonomous variants.[1134] Therefore, while it is implicit, HRW are actually suggesting that where an individual cannot be held accountable for a crime, the default position is that the weapon used for carrying out that crime must be seen as inherently unlawful. This position is simply untenable.

Furthermore, while HRW are insistent that individual criminal liability is a requirement under international law, that is simply not the case. The lawfulness of a weapon's system, autonomous or otherwise, can never be determined on the matter of whether or not it is possible to assign personal liability in the event of a breach of international

[1128] See e.g., HRW (2015), *ibid,* n.191, 21-22.
[1129] Charles J. Dunlap, Jr., 'Accountability and Autonomous Weapons: Much Ado About Nothing?' (2016) 30 Temp. Int'l & Comp. L.J. 63, 65.
[1130] See e.g., art. 36 API, *ibid*, n.43. As previously considered, this states that '[i]n the study, development, acquisition or adoption of a new weapon, means or method of warfare, a high contracting party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this protocol or by any other rule of international law applicable to the High Contracting Party.' Again, as previously identified, Dunlap notes that the U.S. is not party to API, and furthermore that art. 36 is not customary in nature. See also, chapter 5 §5.2.3.
[1131] See e.g., Protocol IV CCW, *ibid*, n.138, Chemical Weapons Convention, *ibid*, n.138, and Protocol I CCW, *ibid,* n.138.
[1132] Dunlap, *ibid*, n.1129, 66.
[1133] *Ibid.*
[1134] *Ibid*.

legal obligations.[1135] Even those who do acknowledge that the introduction of AWS may raise a number of fascinating legal questions admit that a lack of accountability does not contribute anything to the argument that AWS are inherently unlawful.[1136] Indeed, the matter of '[w]hether a weapon is per se unlawful is not, and has never been, based on whether an individual can be held accountable for violations following from its use'.[1137]

6.1.5 Additional shortfalls in the Accountability Argument.

The preceding section comprehensively dismissed the suggestion that establishing individual criminal responsibility for the commission of war crimes, and human rights abuses, is a prerequisite of the law of armed conflict. As a result, the so-called accountability gap does not exist. Thus, it cannot be used a method of prohibiting AWS. Before moving on to consider the Part 2 analysis, however, a number of additional weaknesses in the HRW argument can also be identified. These are perhaps, best summarised as an overreliance upon a 'rather basic recitation of the standard criminal justice themes of deterrence and retribution'.[1138]

The primary issue here is, as previously noted, that HRW are keen to point out the need to refer cases to the ICC and previously to other *ad hoc* international criminal tribunals (ICT) such as the ICTY and ICTR. This is questionable in the first instance because the jury is out as to whether the existence (or the potential existence) of an ICT even serves as a deterrent.[1139] Dunlap identifies, for example, that the rebuilding of society following conflict, which includes those in which atrocities have occurred, is an immensely difficult task.[1140] And, it is questionable whether this is made any easier by insisting that accountability is assigned. Indeed, 'efforts to impose individual liability in the name of deterrence against future acts may actually prove to be counterproductive'.[1141]

[1135] *Ibid.*
[1136] Crootof, *ibid*, n.5, 1881.
[1137] *Ibid.*
[1138] Dunlap, *ibid*, n.1129, 66.
[1139] Julian Ku & Jide Nzelibe, 'Do International Criminal Tribunals Deter or Exacerbate Humanitarian Atrocities?' (2006) 84 Wash. U. L. Rev. 777, 833.
[1140] Dunlap, *ibid*, n.1129, 66-67.
[1141] *Ibid.*

Perhaps the most significant argument against the *deterrence* and *reprisal* rhetoric, however, is the fact that international law seeks to restrict such behaviour.[1142] For example, the death penalty, perhaps 'the most coercive of deterrents' has largely been rejected by the international community.[1143] Moreover, IHL expressly prohibits a belligerent from conducting acts of reprisal, even against objects.[1144] As a result, HRW call for a ban on AWS, merely on the grounds that there is a lack of a deterrent to prevent future breached is somewhat strikingly underwhelming.

6.1.6. The Accountability of Autonomous Weapons Systems Under International Law: In sum.

Part 1 has considered the HRW claim that international law mandates the prosecution of individuals who are responsible for committing war crimes. They suggest that in instances where an AWS commits a crime, a human will not be able to be held to account. Thus, according to HRW, there is an accountability gap, which can only be filled by banning AWS. The analysis in Part 1 has firmly demonstrated that there is no such legal requirement. While international law does attempt to provide ways and means of ensuring violations are prosecuted, a lack a suitable method does not lead an instance where a weapon must be prohibited. HRW attempt to add weight to their argument by suggesting that international law must act as a deterrent. They note that AWS are not considered legal persons, nor are they capable of experiencing suffering. However, the deterrence factor was shown to be a moot point at best, not least because international law, itself, prohibits such behaviour. As a result, although the legal accountability argument is a re-appearing one, it does not provide sufficient grounds for prohibiting AWS.

PART 2 The Ethical Responsibility to Assign Accountability.

Introduction.

Part 1 identified that international law does not provide an absolute requirement to assign accountability. Moreover, it established that even if such an obligation did exist,

[1142] *Ibid*, 67.
[1143] *Ibid,* 67, in turn citing, William A. Schabas, *The Abolition of the Death Penalty in International Law* (3d ed. 2002).
[1144] Dunlap, *ibid*, n.1129, 67. Here the author refers to art. 20 API, *ibid,* n.43. This supplies, '[r]eprisals against the persons and objects protected by this Part are prohibited.'

the lack of a *directly responsible* individual does not provide grounds for banning AWS any more than it supports the banning of all side-arms. Nevertheless, irrespective of the fact that there is no positive legal requirement, Part 2 considers whether it would be unethical if an individual could not be held to account for crimes that were committed by AWS. This discussion expands upon *command responsibility*, the concept that was introduced in the previous section. And, as previously noted, with the support of the *Template*, the following analysis demonstrates that this existing military practice can be utilised to ensure there is no accountability gap.

6.2.2 The Need to Dismiss Machine Accountability.

Before continuing with the Part 2 assessment, one particular form of accountability must be dismissed. It has been suggested that embodied Artificial Intelligences (EAI), including AWS, may one day be capable of sentient thought. If this happens, one may posit that the EAIs themselves, could be held accountable for their actions, and could be punished accordingly. However, the present author agrees entirely with the suggestion that 'robots could be scrapped or disabled as a kind of punishment…[is]…absurd'.[1145] In that regard, it is perhaps important to note that GGE's principle 2 also identifies that 'accountability cannot be transferred to machines.'[1146]

6.2.3 Accountability: An Ethical Requirement.

The following section identifies that, despite the previous analysis, there does appear to be a need to ensure that accountability is assigned. For example, at the ongoing discussions at the UN, states have demanded that the potential issues surrounding the accountability are resolved before advanced AWS are deployed.[1147] Indeed (having considered the first principle in Chapter Three),[1148] the GGE's second guiding principle provides that '[h]uman responsibility for decisions on the use of weapons

[1145] Sassoli, *ibid,* n.39, 323-324. Sassoli points in particular to HRW (2012), *ibid,* n.15, 45 where he appears to note with a certain distain that someone seriously suggested such.
[1146] CCW, *ibid,* n.84, Principle 2.
[1147] See e.g., Tetyana Krupiy, 'Unravelling Power Dynamics in Organizations: An Accountability Framework for Crimes Triggered by Lethal Autonomous Weapons Systems' (2017) 15 Loy U Chi Int'l L Rev 1, 2-3.
[1148] As a reminder, Principle 1, CCW, *ibid,* n.84 states, 'International Humanitarian Law continues to apply to all weapons systems , including the potential development and use of lethal autonomous weapons systems'.

systems must be retained…'. [1149] Assigning accountability will, therefore, remain a key area of focus. Thus, regardless of the previous analysis, it cannot be merely swept under the proverbial carpet. Nevertheless, being supplementary to international law, this wider obligation is considered in the following analysis as an ethical requirement.

As such, the obligation could be manifested in any number of ways. One leading argument is provided by Guiora, who articulates his profound discomfort, and indeed his deep scepticism, with the idea of AWS generally. [1150] His discussion is multifaceted, and many of his objections have been addressed in previous chapters. However, the following analysis is conducted in light of his claim that the very 'legitimacy of a military action by the nation-state demands that accountability is integral to its undertaking'. [1151]

At the risk of repetition, this is not demanded by international law, but by something altogether more conceptual. And, to support his proposition, Guiora utilises the example of a lethal attack on Abbas Moussaka that was carried out by the Israeli Defense Forces (IDF). [1152] In the moments leading up to that attack, the IDF were presented with the information that Moussaka's wife and children were in the car with him. As a consequence, it was highly probable that they would also be killed if the IDF proceeded with the attack.

Due to the limited operational window, the IDF senior military commanders nevertheless authorised the attack—crucially, according to Guiora, fully aware of the potential legal implications. [1153] The point of focus here is not the attack's lawfulness (or not), but the claim that those responsible for launching the attack fully understood that they would be held to account if it were to later transpire that they had made the *wrong call*. [1154] As Guiora posits, all decisions must have ramifications, and in the military sphere a decision-maker is subject to a number of methods of disciplinary

[1149] See, CCW, *ibid,* n.84, Principle 2.
[1150] Guiora, *ibid,* n.1107, 394. Here the author states, '[t]he concerns below reflect…[his]…profound discomfort with AWS'. In addition, at pp.396 noting 'the lack of direct human control is the basis for the deep skepticism (sic) expressed'.
[1151] *Ibid,* 398.
[1152] *Ibid.*
[1153] For example, issues may have been raised in regard the collateral damage assessment, i.e., the concrete and direct military advantage (value of target), in relation to expected incidental loss of civilian life (civilian harms). See, art. 57(2)(a)(iii) API, *ibid,* n.43.
[1154] Guiora, *ibid,* n.1107, 397-398.

sanctions should things go awry. This is what he refers to as the 'essence of consequential decision making',[1155] adding that 'a system devoid of accountability is in direct contrast to the profession of arms'.[1156]

The primary issue the present researcher has with Guiora's position, is that like so many others before him, he fails to fully explore the vast range of tactical, operational, and strategic AWS that are likely to ultimately become available.[1157] He does briefly discuss the possibility of AWS operating lawfully in 'relatively uncluttered environments'.[1158] But he quickly diverts his attention to examining the lawfulness of extraterritorial drone strikes instead. Nevertheless, this is exactly the same argument as can be applied in terms of his profession of arms argument, in that, as previously, it must be applied to all weapons systems. The point is, if it is not unique to AWS, how can it be used as a justification for supporting a prohibition only AWS and not on other manned systems?

Guiora also lends his support to Future of Life Institute's (FLI) open letter which has been previously considered.[1159] However, it is perhaps apt that the only AWS which FLI identify is an armed quadcopter 'that can search for and eliminate people meeting certain pre-defined criteria'.[1160] Such a weapon is clearly a hunter-killer drone by another name. The analysis has already shown that although such a weapon could be used as a genocidal tool (which is clearly an unlawful AWS deployment), there are other deployments which might be utterly lawful, and could even be required.

Different AWS deployments, and the resulting delegated decision-making responsibilities, will undoubtably lead to a wide variety of consequences, some of which will relate directly to accountability. However, as the current researcher has stated throughout, regulation can ensure that this is managed responsibly. As a result of failing to account for AWS 'types', while Guiora is right that AWS could 'magnify'

[1155] *Ibid.*
[1156] *Ibid.*
[1157] For example, not only does Guiora's essay focus entirely upon lethal force, but is also comes with the following caveat, 'This Article only concerns itself with AWS used for offensive purposes. That is distinct from defensive weapons systems, including Israel's Iron Dome and U.S. missile defense systems.' See, Guiora, *ibid,* n.1107, 393.
[1158] *Ibid.* Here, Guiora highlights, Robert O. Work and Shawn Brimley '20YY: Preparing for War in the Robotic Age' (CNAS, 2014), <https://img.4plebs.org/boards/tg/image/1433/98/1433981848741.pdf> accessed 23 September 2019.
[1159] Guiora, *ibid,* n.1107, 394.
[1160] FLI, *ibid,* n.7.

accountability issues (perhaps, not least, those which are classified as L4AWS on the *Template*), a magnification of existing nuances within international law is an insufficient grounds for support the prohibition of any specific weapon that is otherwise unlawful - autonomous or not.

At the heart of Guiora's assessment, is perhaps not the acknowledgment of an inherent ethical obligation to assign accountability, but rather his fundamental belief that accountability 'rests on a values system that places exclusive responsibility for the decision to kill another human being on a human being.[1161] This is, of course, a Kantian notion that has already been addressed comprehensively in the previous chapter.

6.2.4 Command Responsibility.

Accountability is not only sought by those in opposition to AWS, but also by those who support their development.[1162] Therefore, it will remain an obstacle in the wider debate until a suitable remedy is identified. Guiora suggests that the 'essence of command is decision making reflecting accountability'.[1163] As previously noted, this supposition manifests itself in the form of *command responsibility*. The remainder of this section, therefore, considers *command responsibility,* and specifically the question of whether commanders 'could bear an even closer responsibility for the actions of autonomous weapons'.[1164]

Command responsibility refers to the relationship between a commander and his or her subordinates. One way in which it can applied to AWS, is for the AWS to be identified as a subordinate. When the noun is considered, a 'subordinate' is defined as 'a person under the authority or control of another within an organization'.[1165] If this is modified slightly to ensure that it encapsulated future EAIs (including AWS), a subordinate might reasonably also be defined as an autonomous entity under the authority or control of another within an organisation.

[1161] Guiora, *ibid,* n.1107, 404

[1162] This section has already introduced a number of essays in opposition to AWS. For arguments in support of AWS that discuss addressing accountability, see generally e.g., Sassoli, *ibid,* n.39, Crootof, *ibid,* n.5, Crootof, *ibid*, n.284, Schmitt, *ibid*, n.42, and Yoo, *ibid*, n.265.

[1163] Guiora, *ibid,* n.1107, 404.

[1164] Yoo, *ibid*, n.265, 487.

[1165] See, 'Subordinate' Oxford Dictionary, *ibid,* n.87.

As alluded to in Part 1, commanders do not only bear criminal responsibility for issuing orders to their subordinates to commit war crimes,[1166] but also where they remain 'wilfully' blind to the acts of their subordinates.[1167] In other words, a commander must not commit a war crime, order a war crime, or allow, through ill supervision, their subordinates to commit a war crime (using their own initiative).[1168] Where they do, a commander is held accountable in all instances. Liability for the actions of his or her subordinates is not absolute. Command responsibility is only applicable where the is a 'personal dereliction' of duty.[1169]

In his recent compressive examination of the role of 21st Century commanders,[1170] King acknowledges that finding a suitable definition of 'command' has previously been an onerous task.[1171] King pays particular attention to the importance of the control of decision-making responsibilities. He also identifies this control as the *principle function* of command, noting that when it comes to mission management, commanders have traditionally tended to exert dominance.[1172]

King identifies that due to the changing character of warfare, and particularly the expanding boundaries of the contemporary battlefield, a new concept of command has emerged. [1173] He notes that the modern commander has not had a choice. They have been forced to distribute their authority to a support network which, in turn, has necessitated a high level of integration and industry professionalism, that now permits a wide variety of decisions to be made, simultaneously, right across the battlefield.[1174]

This is of particular relevance to the discussion relating to AWS for a number of reasons. First, these 'command collectives' are regarded as highly professional units. Moreover, each unit must be highly integrated and acutely aware of which decisions

[1166] Dinstein, i*bid*, n.244, paras. 846-850. It should be noted that the commander can only be said to have committed a crime where the order is carried out by his or her subordinate, see, *Prosecutor v Stanisic et al* (judgement) ICTY-08-91-T (27 March 2013), para. 98.
[1167] Prosecutor v Delaic *et al*., (ICTY, Trial Chamber, 1998), para. 387.
[1168] Dinstein, *ibid*, n.244, para. 850.
[1169] High Command Case (*US v. von Leeb et al.*) (American Military Tribunal, Nuremberg, 1948), 11 *NMT* 462, 543-4.
[1170] Anthony King, *Command: The Twenty-First-Century General,* (Cambridge University Press, 2019).
[1171] *Ibid*. 60-61
[1172] *Ibid*. 56-58, in turn citing, Martin Van Creveld, *Command in War,* (Harvard University Press, 1985), 6-7.
[1173] Generally, King, *ibid*, n.1170.
[1174] *Ibid*, 71.

have been delegated to it. Finally, at least for the sake of the current analyses, future delegated decisions are very likely to include the authorisation to deploy AWS.

There is no doubt that it may be difficult to assign accountability to a single centralised commander. However, the task becomes considerably easier once one acknowledges a need to pass accountability down through the chain of command. This is not a case of "passing the buck", but an insightful recognition of a need to interpret command responsibility in age where both warfare, and command structure has evolved significantly from a time where individuals such as General Bernard Montgomery almost singlehandedly commanded all his troops from his campaign room.[1175]

Of course, Montgomery's contemporaries must be furnished with sufficient information regarding the programming of every AWS at their disposal. It is not enough to say, for example, that a particular course of action was not entirely anticipated. But an AWS should only act according to its programming - even where it operates according to its own machine learning capabilities. In short, the programming must limit certain behaviours, and the commander must be aware of such limits.

C*ommand responsibility* is a logical step for imposing liability on individuals in charge of deploying AWS, because commanders must be proficient in operating the system, and they have the most to gain from using the weapon. A sufficiently well-informed, well educated, commander, with the help of a suitable command structure, is capable of closely monitoring the behaviour of AWS, and also of monitoring the evolving battlefield on the lead up to making the decision on whether or not to deploy an AWS.

RULE 48
Where the commander believes the AWS would be deployed into an operating environment which could be problematic he must make the decision not to deploy the weapon, whatever advantages it may appear to offer over an alternative non-autonomous variant.

Moreover,

[1175] See e.g., *ibid*, 93-94. Also see generally, David Weir, 'Leadership in a Desert War: Bernard Montgomery as an Unusual Leader' (2013) 1 1 Review of Enterprise and Management Studies, 11.

RULE 49
A dedicated command structure must, at the very least have the potential of overriding all AWS that are deployed at the operational and executive level.

This override facility adds an extra layer of protection, though it is not a necessity for tactical deployments of AWS, where the greatest level of MHC is retained.

The inclusion of these rules is supported, in furtherance of those which are intended to ensure that all AWS are programmed to refrain from carrying out an attack where the is any element of uncertainty as to the nature of the target, or to the lawfulness of the attack.[1176] And, with these precautions in place, it is very unlikely that a robot will be capable of 'going rogue',[1177] or of intentionally denying orders, which it must be said, is an utterly human trait.

If a war crime was committed by the AWS, it would, in contrast to the claim of HRW, still be fair to hold a commander accountable. Furthermore, where an AWS was deployed without a sufficiently capable command structure in place, 'civilian leadership in the chain of command, should be accountable for that omission.'[1178] These are realistic expectations, and a reminder of the significant transformation that AWS will make to the *status quo*, meaning that such weapons must not merely be deployed haphazardly.

[1176] The kill switch is a vital tool that must be added to every operational AWS. The inclusion of a kill switch ensures the commander or other individual responsible for the actions of an operational AWS, ensure can maintain a sufficient level of human control over the weapon at all times. The commander will be able to hold effective control over operational AWS, with near real-time accuracy, by utilizing of a number of external systems, including, inter alia, fully autonomous monitoring systems that will alert him or her should an AWS appear to malfunction, or operate in opposition to its programming. Providing a kill switch is included, there is no weight in the argument that the commander cannot be held to account because of the fact that he or she has no effective control over the weapon, as per, for example, HRW (2015), *ibid*, 191, 24-25. For a useful expanded discussion regarding how the concept of command responsibility can ensure accountability also see generally, Margulies, *ibid*, n.1096.
[1177] Some believe that going rogue is purely a notion of science fiction, and that it simply will not happen. However, Sassoli, notes 'I understand "autonomy," however, as including equally autonomous decisions within a framework the robot is unable to override', which fits within Margulies argument already discussed. However, should the developers and programmers of AWS fail to achieve this, Sassoli, for example, sees no reason that commanders cannot held to account for the actions of the AWS. Sassoli, *ibid*, n.39, 326.
[1178] Margulies, *ibid*, n.1096, 433.

The present author is not alone in identifying that *command responsibility* can serve as a suitable mechanism for assigning accountability. Indeed, many individuals share a similar perspective.[1179] Perhaps one of the most notable is Peter Margulies, not least because he identifies key principle that the present researcher believes must be absorbed into the thesis' rules.[1180] Margulies is not himself over enamoured with this prospect of AWS. Nevertheless, he recognises that *command responsibility* can, and does, and work as a method of applying accountability, so long as the unique nature of AWS is acknowledged.[1181]

When it is, Margulies argues (and opponents also accept), that '[b]ecause of the extraordinary technical demands posed by AWS, deploying these weapons will entail a dedicated command structure,' then there is no reason that *command responsibility* should fail.[1182] This is directly reflected in GGE's Guiding Principle 3 which supplies that, '[a]ccountability…must be ensured…including through the operation of such systems within a responsible chain of human command and control.[1183]

There is therefore no reason why a *responsible chain of command* cannot be adequately reflected by a dedicated command structure, and/ or by King's concept of collective command—which, for the sake of the present analysis can be considered as one in the same. As a result, the GGEs principle is amended and reflected in the following rule,

RULE 50
Accountability for developing, deploying, and using AWS must be ensured in accordance with international law, including through the operation of such systems within a dedicated command structure (subject, inter alia, to RULE 2). [1184]

[1179] See e.g., Toscano, *ibid*, n.355, Grut, *ibid*, n.506, Heather Roff, 'Killing in War: Responsibility, Liability and Lethal Autonomous Robots', in Fritz Allhoff, *et al*. (eds.) *Routledge Handbook of Ethics and War: Just War Theory in the 21st Century,* 14 (Routledge, 2013).
[1180] See generally, Margulies, *ibid,* n.1096.
[1181] *Ibid,* 432.
[1182] *Ibid,*433-34, noting that dedicated command structures already exist for 'particularly complex weapons'.
[1183] CCW, *ibid,* n.84
[1184] The argument being that if this is not achievable, there use must be prohibited. This is in contrast e.g., to: Crootof, *ibid,* n.284, 1350. She claims, '[g]iven their destructive capacity and their inherent unpredictability, if autonomous weapon systems continue to be fielded, they will inevitably be involved in an accident with devastating and deadly consequences.'

Moreover, although the present author does not necessarily agree with Margulies suggestion that an AWS 'support team' should stay on-the-loop to monitor all AWS,[1185] his proposal in reflected generally in the following:

RULE 51
If a state deploys an AWS without such a dedicated command structure and…violations occur because of AWS action, senior commanders in that states armed forces, as well as civilian leadership in the chain of command, should be accountable for that omission.

6.2.5 The Concept of Recklessness Under International Criminal Law.

This final section of the Part 2 analysis considers the concept of recklessness in international criminal law which, may be central in determining how 'straightforward' it is to assign accountability. Though it may appear somewhat appear self-evident to the reader, it is important to note that minus an armed conflict, there can be no war crime.[1186] However, although Ohlin identifies that the instances are likely to be rare, [1187] where there is an armed conflict, and a commander deploys an AWS with the intention to deliberately perpetrate an international crime, and, where the AWS does commit said crime, the two elements of a crime will be present.[1188]

Ohlin also notes that in such a case, the prosecution of the commander should be relatively uncontroversial.[1189] However, if a commander was to either deploy an AWS after wilfully ignoring the contrasting advice of their command structure, but did not intend to commit a crime, or, if a commander, and the supporting command structure,

[1185] Margulies, *ibid,* n.1096*,* 433.
[1186] Corn *et al, ibid*, n.632, 278. Here the authors note that it is important to underscore this point, but that crimes against humanity and genocide do not require the existence of an armed conflict, though they may be committed during an armed conflict. However, it is also arguable that an AWS could not commit genocide. This is because in order for an individual to convicted of doing so, the *dolus specialis* of genocidal intent must be established. See, art. 6 Rome Statute, *ibid*, n.14, Ohlin, *ibid,* n.1106, 26. The term *international crime* hereinafter refers to, Crimes Against Humanity, which requires knowledge rather than intent, see art 7 Rome Statute, *ibid*, n.14, War Crimes, as per art. 8 Rome Statute, *ibid*, n.14. these include the Crime of Aggression. Also see, UN Resolution RC/Res. 6 of 11 June 2010.
[1187] Generally, Ohlin, *ibid*, n.1106.
[1188] These are, as previously discussed, (i) the *actus reus* and (ii) the *mens rae*.
[1189] Ohlin, *ibid,* n.1106, 21.

straightforwardly failed to anticipate the commission of a crime by an AWS, the prosecution may have to depend on the criminal law concept of recklessness.[1190]

Although this is not a particularly common observation, it has also been identified by Sassoli. [1191] He notes the accountability of the commander in any situation involving AWS would simply be down to the concepts of intent and recklessness, of which he says criminal lawyers are familiar.[1192] Some believe that a further remedy is required due to the fact that an AWS may still commit a crime that violates IHL, without there being intent or recklessness.[1193] However, in direct contrast, others insist that because accountability is not a condition of existing international law, it simply cannot, and should not, be applied where an act is unaccompanied by either intent or recklessness.[1194]

The previous section demonstrated that the concept of *command responsibility* can bridge the accountability gap, providing the commander is, inter alia, technologically up to speed, and surrounded by a competent support structure who are fluent in the language of AWS.[1195] Where they are not RULE 3 means recklessness may be inferred, due in part, to a lack adequate training. And, as previously noted, this should be applied to all decision-makers, including commanders, higher up the command structure, and even on to the executive.

Therefore, so long as a suitable structure is in place, *command responsibility* can ensure that AWS are operated with sufficient levels of MHC. But, more importantly for the sake of the present discussion, *command responsibility* also makes it possible to

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[1190] *Delalic Case*, *ibid*, n.1167, ICRC Commentary, *ibid,* n.636, 994.
[1191] Sassoli, *ibid*, n.39, 324. See also, Crootof, *ibid*, n.284, 1350. She similarly supplies that '[a]ssuming that no one intended for the accident to occur or acted recklessly, it is unlikely that any person could be held individually liable under existing international criminal law.'
[1192] Sassoli, *ibid.*
[1193] See generally, Crootof, *ibid,* n.284. However, Crootof's essay opens with the paragraph '[u]nlike conventional weapons or remotely operated drones, autonomous weapon systems can independently select and engage targets. As a result, they may take actions that look like war crimes - the sinking of a cruise ship, the destruction of a village, the downing of a passenger jet - without any individual acting intentionally or recklessly. Absent such willful action, no one can be held criminally liable under existing international law. See also pp.1349-1350, where the author argues AWS 'gather information from their environment and make independent calculations as to how to act. The sheer complexity of autonomous weapon systems' methods for making these determinations may make it impossible for human beings to predict what the systems will do'.
[1194] Dunlap, *ibid,* n.1129, n. 65.
[1195] At risk of repetition, if he or she is not sufficiently well informed, it does not lead to an accountability gap, but rather holds the executive structure to account.

identify at least one individual who can be held to account should AWS commit an international crime while under their supervision. This is known the 'cog in the machine' approach, and it has the approval of the Appeals Chamber in *Tadic Case*.[1196] Although Ohlin identifies that this was not a metaphor that was designed to be applicable to AWS, he offers that in actuality, it caters for the indirect commission of war crimes via the use of AWS 'surprisingly well'.[1197]

When applied, it provides that even though an AWS 'is capable of exercising its own independent judgement',[1198] the commander that authorised its use is a cog the in the larger machine, in which all the cogs work together, 'in order to accomplish a particular result.'[1199] In other words, though the commander may not have directly ordered the AWS to carry out an international crime, he is a constituent part of the machine that is responsible for the commission of the crime. According to Ohlin, before *command responsibility* can truly fill the accountability gap, the concept of recklessness under international law needs clarification.[1200] This is, not least, because international law currently treats the concept of recklessness wholly inadequately.[1201]

In what he refers to as a 'major problem', he highlights the fact that there is no international equivalent to the charge of manslaughter that is frequently found in municipal law.[1202] As a result, he suggests, it is unclear, for example, whether, under Article 30 Rome Statute,[1203] international law even recognises recklessness as

[1196] *Tadic Case*, *ibid*, 537, para. 210. Ohlin, *ibid*, n.1106, 4 also identifies the Appeals Chamber approved of the passage from the *Borkum Island* Case, United States v. Goebell *et al*. U.S. Military Commission, Case No 12-489 (1946). This 'refers to the perpetrators as 'cogs in the wheel of common design, all equally important, each cog doing the part assigned to it.'
[1197] Ohlin, i*bid*, n.1106, 3.
[1198] *Ibid*, 10. In this regard, see also generally, Grimal and Pollard (2021), *ibid*, n.4. Here the present author discusses how an AI 'cog-in-the -machine' or 'system-of-systems' approach, can help to ensure, that civilian harms are minimized where force is authorised by a commander.
[1199] Ohlin, *ibid*, n.1106, 10.
[1200] See generally, Ohlin, *ibid*, n.1106.
[1201] *Ibid*, 3 and 30.
[1202] See generally, Ohlin, *ibid*, n.1106.
[1203] See, Art. 30 Rome Statute, *ibid*, n.14. This states, 'Mental Element 1. Unless otherwise provided, a person shall be criminally responsible and liable for punishment for a crime within the jurisdiction of the Court only if the material elements are committed with intent and knowledge. 2. For the purpose of this article, a person has intent where: (a) In relation to conduct, that person means to engage in the conduct, (b)In relation to a consequence, that person means to cause that consequence or is aware that consequence will occur in the ordinary course of events. 3. For the purposes of this article, 'knowledge' means awareness that a circumstance exists, or a consequence will occur in the ordinary course of events. 'Know' and 'knowingly' shall be construed accordingly.'

sufficiently culpable mental state.[1204] Nevertheless, after demonstrating a number of ways in which recklessness could be construed as an international legal concept, he still points to the 'huge problem for the prosecution of a commander who has deployed an AWS that commits a war crime'.[1205]

Although an important discussion, Ohlin's observations do not mean, and nor does he intend for them to mean, that all AWS suddenly become unlawful as a result. Indeed, as previously identified, international law does not strictly require for an individual to be held account. His primary argument is merely that the concept of recklessness under international law needs clarification, due to the fact that criminal sentencing for crimes committed by an AWS, subject to the concept of command responsibility, should be allocated according to the level of culpableness of the commander.[1206] This reasoning is supported by the thesis.

Nevertheless, even with the best training available, and the most competent support team, to say that a commander had acted recklessly for a crime committed by a weapon that he or she had not had contact with for a number of weeks, months, or longer, may be stretching the concept of command responsibility a little too far. Nevertheless, if the technology did become available in order for such a weapon to operate in accordance with all of the international legal obligations identified throughout the thesis, such a weapon is very likely capable of making strategic, *jus ad bellum* decisions. And, as identified by RULE 1, strategy must remain a human undertaking. The *Template* therefore ensures such deployments are prevented. Noting, that is not to say an international court will not find that a temporal disengagement of this magnitude is a reckless act in itself.

[1204] See, Ohlin, *ibid*, n.1106, 22. Here the author identifies that 'it is unsettled whether Article 30 permits a conviction for crimes of recklessness or what civil lawyers call *dolus eventualis* (liability for the risk of a future event and a concrete decision to move forward even in the light of a negative outcome)'. He notes the difference between civil law legal systems who generally understand intent to include *dolus eventualis*, and common law legal systems who in contrast separate knowledge and intent, from the less culpable state of reckless.' He continues on to note that one additional method of reading recklessness could be achieved by the 'unless otherwise provided' provision, that is also contained within Article 30 Rome Statute, *ibid*, n.14.

[1205] Ohlin, *ibid*, n.1106, 26.

[1206] See, Ohlin, *ibid*, n.1106, 25-25. Here he notes, for example, that international law has no way of grading a reckless act as a lower level of culpability, as opposed to an act committed with intent. He suggests that although a court may adjust the level of accountability at sentencing, this runs counter to the need for the offense to be pre-defined and clear.

6.2.6 The Ethical Responsibility to Assign Accountability: In Sum.

The GGE, and others have provided that regardless of the lack of an absolute legal requirement to assign accountability, accountability must nevertheless be assigned. Therefore, the researcher has utilised Part 2 to demonstrate that the concept of *command responsibility* can help to ensure that the human responsible for authorising an AWS deployment can be held to account if a crime that was committed by that AWS. There are significant benefits to using this method to assign accountability. But, perhaps the greatest, is that individual commanders are likely to be particularly hesitant to authorise certain 'far-reaching' AWS deployments (temporally and spatially), such as those that would enable hunter-killer drones. There is currently some uncertainty regarding the offense of recklessness under international law (which would be applied e.g., to the commander who was unaware of an AWS critical functions). And this may mean that the court has to continue to skirt around the issue until it is fully resolved.[1207] However, for the most part, that is an administrative issue that certainly does not render AWS unlawful, or indeed lead to a gap in accountability that is unique to AWS.

PART 3 Additional Methods for Assigning Accountability.

Introduction.

The previous Chapter Six analyses have demonstrated that while accountability is not strictly a legal requirement, it can still be assigned by utilising the concept of *command responsibility*. This is unquestionably the most suitable method for assigning criminal accountability to those who will be directly responsible for AWS deployments. And, for that reason it is the only method which is fully supported by the present researcher. Part 3, nevertheless, considers a number of alternative methods by which accountably might be assigned under the civil law. This analysis demonstrates that a variety of individuals, and entities, could be held to account under this separate body of law. These could range from programme writers to weapons manufacturers, and beyond to the state.[1208] As in previous chapters, however, this final examination is not intended to be extensive (the researchers aims having been fulfilled in Parts 1 and 2). Instead, the purpose of Part 3 is merely to identify any alternative research pathways in this

[1207] See generally, Ohlin, *ibid*, n.1106.
[1208] See generally, Crootof, *ibid*, n.284.

area. In this instance, the analyses are kept to a minimum, not least because while the methods identified below may be capable of providing restitution to those who are harmed by AWS deployments, they should only be used in support of *command responsibility*.

6.3.2. The Nature of Accountability Under the Civil Law.

Before moving on to consider the parties that could be held accountable under civil law, this section identifies the nature of the civil law remedy. This is important because in contrast to the criminal law (which seeks to protect society by prohibiting certain actions),[1209] civil law focuses upon the individual who brings an action before the court (the victim) having suffered some form of harm. Those found in breach of civil law will typically have to restore the victim to the position that they were in before the harm occurred.[1210] In other words, rather than passing down a custodial sentence, as per the criminal court, a civil law will look to provide a remedy that involves the guilty party compensating a victim with a suitable financial award.[1211] An individual seeking a civil remedy for harms committed by an AWS could potentially bring a suit against two parties, either the user of the AWS (in the form of the state),[1212] and/ or the AWS manufacturer.[1213] There may also be a shared liability, in other words, a mix of the two.

6.3.3 User Accountability.

As identified above, the first of the two parties that a victim may attempt to seek a civil remedy for a crime committed by an AWS is the user. In most cases this will be the State. HRW 2015 refers to this as *military accountability*,[1214] and suggests that because militaries are likely to possess a greater financial capacity than any single individual

[1209] See e.g., HRW (2015), *ibid,* n.191, 26, and Crootof, *ibid,* n.284, 1348.
[1210] See e.g., Avihay Dorfman, 'What is the point of the Tort Remedy' (2010) 55 1 American Journal of Jurisprudence, 105, 105. Here, citing, William L. Prosser, John W. Wade, and Frank J. Trelease (Rep.) *Restatement of Law*: *Torts,* (American Law Institute, 1979), §901, the author provides '[w]hile the law of contracts gives to a party to a contract damages for its breach an amount equal to the benefit he would have received had the contract been performed…, the law of torts attempts primarily to put a person in a position as nearly as possible equivalent to his position prior to the tort.'
[1211] HRW (2015), *ibid*, n.191, 26. Here, for example, the report offers '[m]onetary damages are the most common penalty, and compensation, along with the stigmatization of the guilty party, can help victims feel a sense of justice and deter future acts.'
[1212] Though perhaps, if an NSAG was responsible for deploying an AWS which went on to commit a crime, the organization (or members thereof) may not be identifiable, and/or they may refuse to accept a civil courts jurisdiction.
[1213] HRW (2015), *ibid*, n.191, 26.
[1214] *Ibid*, 27-29.

(e.g., a combatant), and because government employees are often immune from civil actions when performing their duties, suing the State is likely to be the most appropriate course of action.[1215] HRW use the case of the U.S., however, in order to demonstrate why the state would often evade accountability under the civil law.

According to HRW, the primary problem with *military accountability*, specifically in the U.S., is that vast majority of cases the U.S. government is immune from civil actions.[1216] Moreover, in the limited circumstances in which immunity *is* waived, the government would nevertheless escape liability for a number of reasons. First, they note that the policy decision to use an AWS in a certain environment would fall under a 'discretionary function exception'.[1217] In addition, they add that the 'combat activities exception' would immunize the government from civil liability because this 'is the most likely context'[1218] in which AWS will be used. Finally, they argue that 'foreign country exception' will provides immunity from civil liability where the claim arises in a foreign country. Of course, this would include all military conduct that occurred overseas, 'even if the activities were planned by members of the US government in the United States.'[1219]

Prima facie, it appears that in almost all circumstances in which AWS are deployed (especially those which are relevant to the present body of research), these three 'clauses' would prevent an individual from launching a civil action. The primary difficulty with the HRW line of reasoning, however, is that it fails to point out these exceptions apply as much to any harms that were caused by the pilot of an F35 fighter as they do an AWS. As a result, they cannot be utilised as a unique justification for supporting a prohibition on AWS.[1220]

[1215] HRW (2015), *ibid*, n.191, 27.
[1216] HRW (2015), *ibid*, n.191, 28. Here, the report identifies that the U.S. government and government employees are generally immune from civil lability. It also notes that the U.S. has waived this immunity in certain circumstances, such as the Federal Torts Claim Act (FTCA), but that the waiver is still subject to three exceptions, (i) the discretionary function, (ii) the combat activities exception, and (iii) the foreign country exception.
[1217] *Ibid.*
[1218] HRW (2015), *ibid*, n.191, 28-29.
[1219] HRW (2015), *ibid*, n.191, 29.
[1220] Indeed, it is perhaps not surprising that any armed force would seek to protect itself from civil accountability in matters relating to operational decisions such as the choice of weapon. In addition, although IHL may guide a commander to choose a specific type of weapon, it very rarely forces them to deploy it. For further analysis and discussion regarding feasibility, see e.g., Schmitt and Widmar, *ibid,* n.527, 397-404, and Corn and Schoettler, *ibid*, n.534, 807-814.

It is, perhaps, noticeable that HRW are critical of the fact that the U.S. in particular, have protected itself against civil actions arising from its military activities. However, they fail to identify the U.S. has not ratified either API or AP II, or the Rome Statute acknowledging the jurisdiction of the International Criminal Court (ICC). With that in mind, the HRW discussion regarding criminal accountability is also largely irrelevant, insofar as the U.S. is concerned, because U.S. military decision-makers are also immune from international criminal prosecution.

6.3.3.2 International War-Torts.

One observer, Rebecca Crootof, believes there is novel a way overcoming a lack of state level civil accountability - international torts. These do not currently exist, but she argues the introduction of increasingly advanced AWS can provide the perfect platform on which to build upon her discussion.[1221] She provides a number of examples where existing technologies have malfunctioned with catastrophic consequences. And, in doing so argues that AWS *will,* inevitably, be involved in an 'accident' that will result in a loss of life.[1222]

According to Crootof because these accidents are likely to happen in lieu of intent or recklessness. Thus, she argues, international torts are an ideal tool to fill the gap. There are a number of things to consider here, but no need to conduct a second comprehensive appraisal. The first is merely that the conceptual gap to which Crootof refers is not a legal one. Therefore, there is no necessity, in a legal sense, to identify a completely new concept by which to fill it (if indeed it existed). The second, is that providing AWS are deployed according to the rules offered herein, recklessness (at least in the criminal sense) will generally be applicable.[1223] And, in the civilian realm, this could theoretically be translated into negligence.

Nonetheless, while some argue that any attempt to try to introduce international civil law would be 'extremely problematic',[1224] international torts could well be beneficial. Indeed, with enough support, the international community might well decide that tort-law could play a future role *supporting* the victims of international crimes, and perhaps

[1221] See generally, Crootof, *ibid*, n.284.
[1222] *Ibid*, 1350.
[1223] Subject to the caveat noted in 6.2.5.
[1224] Dunlap, *ibid*, n.1129, 74.

specifically those committed by an AWS. If this is to happen, however, war-torts should play no more than a supporting role to *command responsibility*, and not be seen as a replacement for it. One reason this is important is because *command responsibility* will directly affect a commander's decision-making process, and with the support of the legal framework presented herein, even prevent him or her from authorising certain AWS deployments. In contrast, international torts are unlikely to greatly affect operational decision-making, even though they might add a welcome additional layer of protection via the remedy of compensation.

6.3.4 User Accountability: In Sum.

Potentially, where an AWS 'committed' harms, the victim could seek restitution in the civilian courts. Nevertheless, certain states, and arguably those more likely to deploy AWS, have legislative safeguards in place to prevent this happening. These safeguards are universal, however, so they apply as much to a piloted weapon, or non-autonomous munition, as they do to an AWS deployment. As a result, any lack of state civil liability cannot be used as a method for prohibiting AWS. Of course, this is especially relevant given that international law does not require for accountability to be present.

The researcher has previously demonstrated that there may be an ethical argument for assigning accountability, and this may also be true in the civil law realm. In this respect, international 'war-torts' may be adopted in the future. These could help to overcome a lack of state level civil accountability (if it did exist). However, even if they were implemented, it is unlikely states would freely choose extend liability to choice of weapon. Instead, they are more likely to also be universally applicable. Nevertheless, not matter whether civil liability is a remedy or not, it must always play only a supporting role to the commander's criminal accountability identified in Part 2.

6.3.5 Manufacturer accountability.

The previous discussion noted that the users of AWS, states, are often (self) protected against civil litigation. In short, this means that in many cases, a victim may be prevented from seeking damages in the civilian courts. This section considers a second avenue of redress which, may still provide restitution for harms caused by an AWS - manufacturer liability. In the first instance, one thing is almost certain, where a programmer, or manufacturer, designs and produces an AWS with the intention that it

targets and engages protected individuals or objects, they would be *criminally* responsible.[1225]

One would imagine that this (unlawful) design feature would not have been requested by the user. Moreover, if the *actus reus* had occurred, it is also unlikely that it was not identified to the user.[1226] Consequently, the individual who faces criminal charges might also be open to a civil litigation.[1227] Should the AWS manufacturer be found to have acted recklessly/ negligently in failing to prevent an employee from intentionally incorporating this design feature, or if they knew of it and failed to act, they would also very likely be criminally and civilly accountable.

Where there was no intent, and where an employee or employer had not acted negligently or recklessly, there is a question whether an individual or weapons manufacturer could or should be held to account for a crime that was committed by an AWS. Indeed, this might potentially lead to an accountability gap - of sorts. This is primarily because weapons manufacturers are often, in the same way as the user, immune from criminal litigation, [1228] and civil actions arising from wartime activities.[1229] As a result, in contrast to typical civilian manufacturers, AWS builders could not be held liable under civil law for manufacturing defects,[1230] and design defects,[1231] in all circumstances.

The problem here once again, is that the so-called accountability gap is both necessary, and perhaps more impotently, applicable to all weapons. In the first instance, it is perhaps unsurprising any state that is heavily committed to defence spending, offers

[1225] See e.g., McFarland and McCormack, *ibid*, n.1100, 375. Here the authors provide, '[w]here evidence exists of an explicit common criminal purpose in which weapons developers intentionally develop a weapon system for a known illegal purpose, the fact that certain actions were undertaken prior to the commencement of an armed conflict in which the weapon was subsequently deployed and the intended crimes perpetrated will not preclude prosecution of the developers' conduct', The authors do however offer that cases where it can be proved the developer acted with specific intent is likely to be rare. See, pp.381. Instead, their examination considers whether other criminal concepts, such as aiding and abetting, could help to ensure criminal accountability of developers can be achieved.
[1226] HRW (2015), *ibid*, n.191, 30. Here the report identifies three criteria (at least in the U.S.) that prevent a private weapons contractor from being held liable for harm caused by a defective weapon, (i) if the government approved particular and precise specifications for the weapon, (ii) the weapon conformed to those specifications, and, (iii) the manufacturer did not deliberately fail to inform the government of a known danger of the weapon of which the government was aware.
[1227] *Ibid,* 30, n.84.
[1228] *Ibid,* 30.
[1229] *Ibid,* 31.
[1230] *Ibid*.
[1231] *Ibid,* 33.

immunity to weapons manufacturers. In fact, it is arguable that such immunity is a fundamental strategic requirement. This is not least because (given their line of business) if weapons manufacturers were left entirely open to civil litigation for all unanticipated actions, they would likely be very hesitant either to develop, and/ or to sell, such weapons – particularly those that need to be particularly advanced, and/ or autonomous.

One reason that States may consider it strategically necessary to reconsider providing absolute immunity to AWS manufacturers is the introduction of AWS 'black-box' evidence into the court room. For example, it is likely that there would be widespread condemnation if manufacturers, and private businesses, were offered full protection against civil liability, even where they clearly failed to produce weapons that met sufficiently stringent standards. Indeed, any framework for regulating the production and use of AWS should include a rule that ensures manufacturers are held to account in some circumstances.

While it is true that AWS will, by their very nature, be more autonomous that other weapons systems, AWS will also be capable of recording every instruction they are given, in addition to every decision they make independently. Perhaps somewhat significantly, an AWS will not refuse orders, lie, or even distort the truth in order to protect themselves, or their compatriots.

Consequently, as long as the regulatory framework for the production and use of AWS includes a requirement for black-box technology, this level of openness will in fact make AWS more accountable than their human counterparts. [1232] And, in any criminal, or civil, investigation into the lawfulness of a particular attack, whether that be at the ICC or at a regional military tribunal, or a civilian court, the *black-box* could be requested by the court as evidence in order to determine the precise nature of the attack.[1233]

[1232] As discussed in Chapter Five in relation to RULE 45, black-boxes are not merely an appealing accessory, but should in fact be considered an essential item for monitoring AWS deployments, and developments. Whether in R&D or active duty, where humans are not present, it is vital that a monitoring algorithm records the autonomous decision-making processes of AWS in order provide feedback to the manufactures, programmers, and primary users.

[1233] For example, whether the AWS was following instructions, malfunctioning, or was operating in an environment beyond the weapons capability. Such a committee should be given access to this upon

6.3.5.2 Manufacturer accountability: In Sum.

Where an AWS committed a crime, and where either an individual or a manufacturer acted with intent, it is very likely that they will be held criminally accountable. Moreover, either might also be shown to have acted recklessly, and negligently under the civil law. Even where a party can be identified, however, civil courts may not always be able to ensure a victim receives restitution. This is because, in some instances, individuals, and/ or entities, could be protected against prosecution. It is difficult to fathom, however, how this is uniquely applicable to AWS deployments.

Instead, this can only be seen as another attempt to prohibit AWS by harnessing a universally applicable reality. The truth (without international tort law) is that civil law remedies are very much dependent upon individual, municipal, jurisdictions. And, as a consequence, the remedy that a victim may be entitled to in one State, may be very different to a victim in another. Unfortunately, an in-depth investigation of civil liabilities is beyond the remit of the current thesis, which seeks only to examine the lawfulness of AWS under international law. Nevertheless, any lack of accountability in the civil realm can no more prevent the deployment of sea-mines,[1234] than it can the use of AWS.

6.3.6 Chapter Conclusion.

Chapter Six has carefully scrutinised what some believe is the 'most serious concern' raised by AWS - the claim that there will be instances where it will not be possible to identify a human to be held accountable for unlawful harms caused by AWS deployments. Part 1 identified that this is one of the oldest arguments used to oppose AWS deployments, and many believe that this lack of accountability is in breach of international law. Consequently, opponents believe that AWS must be prohibited. Part 1, however, demonstrated that there is no absolute legal requirement to assign accountability. Indeed, while international law does attempt to provide a means of

request, which may, for example, be where an AWS commits a crime. For a similar discussion see e.g., Sassoli, *ibid*, n.39, 326,

[1234] National Research Council, *Naval Mine Warfare: Operational and Technical Challenges for Naval Forces* (*The National Academies Press*, 2001) https://www.nap.edu/download/10176 accessed 20 May 2021.

ensuring certain violations are prosecuted, a lack an accountable individual has never served as an impetus for prohibiting any weapon.

The analysis in Part 2 examined the wider, ethical obligation to assign accountability, which has been identified, for example by the GGE. This discussion further considered the concept of *command responsibility*, and identified that with the support of the *Template*, this existing military practice can be utilised to ensure there is not generally an accountability gap. Part 2 noted that there are certain benefits to adopting this method of assigning accountability, not least the fact that it provides a natural method for ensuring commanders are hesitant in authorising AWS such as hunter-killer drones. This discussion noted that there is some uncertainty regarding the criminal offense of recklessness in international law, but also that such a lack of suitable definition does not automatically lead to an accountability that is unique to AWS

The final, albeit brief, examination in Part 3, considered a number of ways in which accountably could be assigned by the civil law authorities. This included methods which are both existing and conceptual. This analysis did identify that there may potentially be ways in which individuals, manufacturers and end users of AWS could be held accountable if an AWS did commit harms. However, there are often legislative safeguards in place to prevent a civil remedy being sought. Nonetheless, these are universally applicable and not, therefore, unique to autonomous deployments. Some argue that accidents happen, and minus recklessness, negligence and/ or intent, there should simply be no accountability. In contrast, those responsible for deploying AWS might chose to agree on a strict liability for crimes that were committed by an AWS. This remains an area in need of further examination, but whatever the outcome, such a remedy must only be seen as supplementary to the direct applicability of *command responsibility*.

CHAPTER SEVEN. A LEGAL FRAMEWORK FOR REGULATING AUTONOMOUS WEAPONS SYSTEMS DEPLOYMENTS.

Chapter Introduction.

This penultimate chapter uniquely fuses the discussions in the preceding analysis in order to address the overarching aim of the thesis, namely, to construct a comprehensive and robust legal framework to regulate the use of Autonomous Weapons Systems (AWS). The framework is a summation of the rules that have been identified throughout the previous investigations. These are referred to holistically as *guiding principles*. This chapter is somewhat of a pre-conclusion and, due also to the fact that the researcher intends for this chapter to operate as a stand-alone instrument, a frequent restating of previous discussions is unavoidable.

By way of overview, Chapter Seven commences by offering the two thesis definitions of AWS. Each of the 51 pre-identified rules are then considered, and accompanied by a brief summary as to why each rule should be applied to AWS deployments. Due to the summative nature of these discussions, footnotes are only used where new information is introduced. However, and for convenience, each RULE clearly directs the reader back to the relevant section of the thesis. Chapter Seven also includes a number of annexes. Each of these refers to a graphical representations which have previously aided the researcher to communicate a RULE (or series of RULES).

7.1 A Background to the Guiding Principles.

The following set guiding principles have been created following a thorough, and unique analysis of AWS deployments. This analysis had regard of the three relevant legal disciplines, and it was uniquely undertaken with reference to a single comprehensive, multi-axis, definitional tool (see Chapter One, or §7.2 infra). The following is therefore an unparalleled legal framework that is infinitely more capable than any other method of regulating AWS deployments. Because each rule is fundamentally grounded in an existing legal obligation, the framework is offered as a soft-law instrument. This is particularly useful because it means that states will not be required to negotiate a new treaty, which is both a time consuming and inherently

unpredictable process. Instead, states need only to re-commit to existing law, but with an emphasis on AWS deployments.

The following series of rules are not intended to be exhaustive. States may wish, for example, to negotiate further rules relating to accountability, which could take the form of strict liability in tort law. In addition, states may wish to add further rules stemming from the fields of ethics and morality. Nonetheless, other than those offered, such additions generally lie outside the remit of the present body of study, which has sought to identify obligations which are grounded in international law. Nevertheless, by supporting this regulatory framework, states can ensure that the potential humanitarian benefits of AWS are nurtured, while the associated frictions, are minimized (to a level similar non-autonomous technologies), and in some circumstances eliminated altogether.

7.2 General Definition of Autonomous Weapons Systems.

For the sake of the following guiding principles, an AWS is defined 'generally' as,

An AI or EAI, or a combination of such systems, that is designed to apply a lethal or non-lethal force to military personnel and/or military objects. Following its activation, an AWS must have some degree of flexibility as to how it completes the four tasks assigned by the OODA loop, while remaining free from human coercion - though not necessarily from human supervision.

This definition represents a deconstruction, analysis, and reconstruction of the three constituent elements of AWS – autonomy, weapon, and weapons systems. And this does definition is of some use, it being capable of identifying whether a particular weapon should be considered autonomous (or not). However, general definitions such as this, are intrinsically rudimentary, that being the only real distinction they are capable of making. Consequently, neither the researchers general definition, nor any such other general definition that have been provided by various international institutions, for example, can support the comprehensive legal analysis of AWS that is necessitated by the construction of a regulatory legal framework.

Although they do serve a limited purpose, General definitions fail for a number of reasons. Not least of which, is the fact that each one potentially encapsulates an infinite

number of weapons and weapons systems. A further reason they cannot be used to support a comprehensive analysis, however, is that they are also incapable of considering individual AWS deployments. The most important of these being the matter of whether an Aws is to be used offensively, or defensively, and/ or whether an AWS is to apply a lethal, or non-lethal force. Such distinctions are vital when examining AWS deployments because the legal obligation can vary depending upon those conditions.

7.3 A Comprehensive Method for Defining AWS: The *Template.*

In contrast to general definitions, which lack the ability to support an extensive legal analysis, the *Template* offered below can. This unique classification system is capable of accounting for individual deployments thus, this is the most appropriate tool for supporting the construction of the legal framework. It does so by placing each AWS in one of 16 categories of AWS that are identified upon the three-dimensional definitional tool. Axis 1 represents four levels of autonomy (see the key to the *Template* in § 7.3.2), Axis 2 the matter of whether an AWS is to be used offensively or defensively, and, Axis 3, the matter of whether a kinetic of non-kinetic force is to be applied by the AWS. In its two-dimension form the *Template* appears as follows,

L	L4	N	D	L4	O	N	L4	L	O	L4	D
L	L3	N	D	L3	O	N	L3	L	O	L3	D
L	L2	N	D	L2	O	N	L2	L	O	L2	D
L	L1	N	D	L1	O	N	L1	L	O	L1	D

Figure 24: The *Template*.

7.3.2 The Key to the *Template*.

The following key is provided in support of the *Template*. And, when both of these are considered in light of the guiding principles, a commander responsible for authorising the deployment of AWS, and an individual tasked with retrospectively assessing such deployments, has an instant method of assessing its lawfulness.

D = Defensive/ Re-active use of force L = Lethal application of force	O = Offensive/ Pro-active use of force N = Non-Lethal application of force
L4 Executive Operating System	Capable of making the political decision of whether or not to enter into a fresh armed conflict
L3 Command Operating System	Capable of strategic battle planning and of directing other systems (including humans)
L2 Weapons Platforms (Recoverable)	Capable of selecting and firing munitions upon targets of its own accord
L1 Munitions (Single Use)	A non-recoverable weapon that is designed to destroy a target or, a type of target.

Figure 25: The Key to the *Template*.

7.4 General Principles for Regulating Autonomous Weapons Systems Deployments.

The following series of guiding principles, which have been developed to regulate AWS deployments, are the result of an extensive analysis into the lawfulness of AWS deployments under international law. These analyses considered the three legal disciplines that are appliable to AWS deployments, the *jus ad bellum*, the *jus in bello* (otherwise referred to as IHL), and International Human Rights Law (IHRL). But, in addition, just war theory and ethics also formed part of the examination. Because the *Template* was at the heart of each of these analyses, the investigation into the lawfulness of AWS was incomparably consistent from a definitional perspective. And, the resulting guiding principles are, therefore, especially unique, and vitally, unconditionally comprehensive in nature.

As the reader will identify throughout the remainder of this chapter, some principles are applicable to AWS in general, while others refer more specifically to individual systems (or classifications). And, where no classification is indicated, each principle should be presumed to be generally applicable. The guiding principles are presented according to discipline because the researcher does not believe they are of a hierarchal nature. Indeed, the flowing principles are inter-related and should be considered holistically. Where two or more principles are directly linked (for example, where a latter rule restricts a former), this is indicated by the term '*see also*'.

7.4.2 Rules Stemming from the *jus ad bellum.*

RULE 1
States must be prevented from developing and deploying L4AWS that would be capable of strategic level decision-making.

RULE 1 (2.1.9) stems from the strategic realm as opposed to the strictly legal. However, it plays a central, if not critical role in restricting AWS deployments. The reason strategic decision making should not be delegated to AWS is because Strategy is an inherently human condition. It is the method by which a state secures is position in the global order by ensuring - via the use of diplomacy, trade, and military means - that its future national objectives are met. Strategy requires assumptions to be made, not least regarding a competing states future behaviour, which, of course, is not an altogether reliable practice.

If strategic decisions were placed in the hands of machines, humans might very quickly lose control of a situation. Where such decisions involved the authorisation of violence in order to achieve predetermined goals, the implications are clear and obvious. A situation could very quickly deteriorate, and a human commander (or other such operator) might have little, to no, input as the direction of a particular course of action. In short, the use of strategic AWS could lead a state to lose *control* over its national strategy, and, moreover, a loss of *understanding* of its national strategy.

RULE 2
Autonomous Weapons Systems must not be delegated decisions which regard the use or threat of force, other than where such a decision is in self-defence, and only then where the need to act is instant, overwhelming, with no choice of means, and no moment for deliberation.

RULE 2 (2.2.2) directly reflects the fundamental *jus ad bellum* principles of necessity and proportionality, as reflected in Daniel Webster's widely cited formulation contained in the correspondence regarding the *Caroline incident.* It applies in all cases of self-defence, but perhaps most notably in instances of anticipatory self-defence. In this case an AWS must only respond to an 'imminent' threat of a grave use of force where the State resorting to self-defence has exhausted all non-forcible measures, and only where it would be wholly unreasonable to expect the responding state to attempt a non-forcible response. If this is not the case, a use of force would be pre-emptive self-defence, which is considered to be an unlawful act whether utilising an AWS, or a non-autonomous weapons system.

RULE 3
Training leading to an appropriate level of user knowledge must accompany every Autonomous Weapons System deployment.

RULE 3 (2.2.4.2) is required because each AWS will have very different, and often unique, operational parameters. An AWS may, for example, be a munition, a fixed position defensive system, and/ or an independent platform which is capable of operating for extended periods of time, and at a significant geographical distance from the individual responsible for authorising its use. As a result, commanders, and all other military personnel who are responsible for AWS operations, must receive full, weapons specific training. In other words, any individual who is involved in the chain of

command, and who is in any way linked to AWS deployments must be fully aware of the specifics of its operation, and must, for example, be aware of an AWS limitation.

A secondary reason such training is required, is that where a human is responsible for deploying and/ or monitoring an AWS operation, their judgement may be affected by bias'. For example, historically, where military personnel have lacked significant training, they have been known to trust machines implicitly, i.e., without question. This concept is known as automation bias. In contrast, a second concept to consider is conformation bias. In short, this could refer to a situation where a human has made a targeting error, but one which has been detected by a machine such as an AWS. In such an instance, conformation bias might lead an untrained human operator to refuse to 'trust' or to acknowledge the AWS, an instead to continue to target and engage a friendly or civilian target. In both cases, a commitment to ensure full weapons specific training can help to avoid a repetition of previous fatal human errors

RULE 4
Autonomous Weapons Systems must be capable of receiving real-time multi-domain battlefield updates, and of acting accordingly.

RULE 4 (2.2.4.2) is supplementary to Rule 3, and is intended to apply to more specifically to AWS which operate at a distance (temporally and spatially) from the individual authorising its use. One clear strategic benefit of such an AWS is the fact that it can operate with very limited, and potentially, absolute, radio silence. Nevertheless, the 'trained' individual who is responsible for its authorisation must be capable of restricting its operational parameters where necessary. This may include, for example, instances where extraneous events necessitate a change in tactical and operational decision-making. And this is applicable to the *jus in bello*, as much as it is in the *ad bellum*.

RULE 5
L2AWS should only be deployed to abate an armed-attack, where the human commander has authorised a specific target, or group of targets, having confirmed with intelligence that it/they provide(s) a sufficiently grave threat.

RULE 5 (2.2.5.3) is intended to apply only to L2AWS with regards to abating further attack. And AWS deployments of this kind would generally follow a lawful application of force in self-defence, in response to having suffered an armed attack (as per Article 51 UN Charter). Different rules apply when an AWS is used to abate an attack, as opposed to intercepting or deflecting an attack, because the action is not re-active in nature, but pro-active. As a result, the *Template* classifies acts to abate further attacks as offensive rather than defensive – even though the application of force to abate an attack is a lawful form of self-defence. Nevertheless, Rule 5 it is grounded upon a commanders wider obligation to ensure the object that every application of force has been identified by a human. This is perhaps best summarised by Rule 26 (see *infra*), which states, AWS are prohibited from treating humankind as a target, type of target, or a group of targets.

RULE 6
L3AWS O/L are prohibited under the *jus ad bellum*. The use of L3AWS O/N is permitted, subject to existing legal provisions, not least, *jus ad bellum* necessity and proportionality and e.g., Rule 5.

RULE 6 (2.2.5.4) prohibits offensive uses of an L3AWS that is intended to apply a lethal, and typically kinetic, force to abate an attack under the *jus ad bellum*. Note that where a non-kinetic force is to be applied, but the consequences suffered either cause or are intended to cause harms that would qualify as an Armed-Attack (Article 51 UN Charter), this is likely to constitute lethal force and thus would also be classified upon the [L] axis (see 2.2.2). This rule is required because human decision-making must continue to play a central role when considering a response that could potentially cause a great deal of civilian harms. Where damage is likely offensive acts to abate further attacks must adhere, inter alia, to *jus ad bellum* necessity and proportionality. However,

where a non-kinetic force is applied, and where either no civilian harms are caused, or where objects are only temporarily incapacitated (with no lasting damage or associated collateral damage) the use of AWS in general is, subject to existing obligations, lawful. Indeed, in many situations, arguably, a non-kinetic attack would be preferable to a kinetic attack where such means are available.

RULE 7
Where they exist, a commander may deploy either a L1 AWS, L2AWS, and/ or L3AWS that is designed to apply a non-lethal force against an unspecified target, providing such an act is consistent with the *jus ad bellum* principles of necessity and proportionality.

RULE 7 (2.2.5.4) is applicable to all lawful AWS deployments under the *jus ad bellum,* and not only those that are designed to abate an attack. The primary reason for the inclusion of this rule has already been discussed with regard to Rule 6 above – i.e., that relating to the non-kinetic application of force by an AWS.

RULE 8
L4 AWS must not be utilised to abate future armed-attacks.

RULE 8 (2.2.5.5) is a direct result of Rule 1, which plays a central role in the functioning of the guiding principles. As previously noted, Rule 1 ensures that strategy remains an inherently human affair. An act to abate a further attack, that is, an act taken in defence of one's territorial sovereignty and/ or political independence, will almost certainly be extraterritorial in nature. Matters, and specifically decision-making, regarding the extraterritorial application of force are inherently strategic in nature. Thus, L4AWS must be prevented from acting this manner, regardless of whether they are used to apply a force that is kinetic, non-kinetic, lethal or non-lethal. Importantly, where an AWS such as an autonomous missile defence shield (MDS) is used to repel an armed attack, its maximum operational level is L3AWS. This is primarily because the MDS' mere existence, is evidence that the strategic level decision relating to the

application of extraterritorial force to intercept an attack has already been taken/ authorised by a human.

7.4.3 Rules Stemming from the *jus ad bellum:* In Sum.

This section has introduced eight rules which stem from the *jus ad bellum*, and which help to form the guiding principles for regulating AWS deployments. A number of these relate specifically to AWS that are deployed for the purpose of self-defence. However, unless otherwise stated, they are universally applicable. Where a type, or classification of AWS is not referred to, either directly or indirectly, its use should be presumed to be lawful, subject to the provisions of international law, and the wider body of guiding principles. These rules do not represent a set of specific AWS rules of engagement (ROE) - that is the business of states. Instead, these 8 Rules, as with those referred to in the following sections, reflect only the instances where international law (supported, for example, by strategy and ethics) restricts and/ or prevents certain deployments.

7.4.4 Rules Stemming from the *jus in bello* (International Humanitarian Law).

RULE 9
The development and use of AWS is, and will remain, subject to International Humanitarian Law.

RULE 9 (Chapter Three, Part 1) is offered by the Group of Governmental Experts (GGE) on Emerging Technologies in the Area of Lethal Autonomous Weapons. The GGE is convened by the United Nations (UN) under the auspices of the Convention on certain Conventional Weapons (CCW). In 2019, the GGE, which has been meeting formally since 2017, adopted a set of 11 guiding principles. This is first of those, and also one which is clearly relevant to the present section. Primarily, this rule ensures that all new autonomous technologies cannot operate outside of IHL, regardless of whether it introduces a novel method or means of warfighting. Importantly, Rule 9 extends the obligation further than the GGE however, because it applies to all AWS, not only those which are designed to apply a lethal force.

RULE 10
Where civilians are present AWS must be capable of distinguishing civilians and civilian objects from legitimate military objectives. Following this distinction, an AWS must also ensure that only legitimate military objectives are the subject of a direct attack, and that civilians and civilian objects are not subjected to indiscriminate attacks.

RULE 10 (Chapter Three, Part 2) reflects the Article 48 Additional Protocol I (API) principle of Distinction – which is a 'cornerstone' of IHL. Article 48 identifies the 'basic rule', which seeks to ensure that the civilian population is protected as much as possible from the dangers associated with war - doing so by ensuring military personnel first always distinguish civilians and civilian objects from legitimate military targets. This fundamental IHL provision is also universally binding due to its customary nature. The second half of the obligation (which is also CIL) ensures that once they have been distinguished from a legitimate military target, civilians (and civilian objects) must not be direct attacks. RULE 10, therefore, ensures that AWS must be capable of operating in adherence with distinction where civilians are present (or likely to be present). Though note that there are certain deployments, e.g., on the high seas, in sub-marine environments, and in outer space, the presence of such civilians would be very unlikely.

RULE 11
Until a definitive interpretation of Direct Participation in Hostilities (DPH) is agreed upon, and an AWS has a proven ability to carrying out the level of DPH assessment that a mission requires, AWS must not be deployed where such assessments are likely to be necessary.

RULE 11 (3.2.3) is required because of the existing Article 51 (3) API (and Article 13 (3) Additional Protocol II (APII)) legal obligation to distinguish civilians participating in hostilities, from those who are not. This is a codification of widely established custom that an individual taking a direct part in hostilities becomes lawfully targetable. Although there is some controversary surrounding the extent of the obligation, RULE 11 ensures it remains applicable to all AWS deployments.

RULE 12
Where an AWS is deployed into an environment where an (unpredicted) DPH assessment becomes necessary, and where that AWS does not have the capacity to carry out the required level of DPH assessment (or where there is no additional guidance from a third-party), AWS must refrain from taking further action. This may be either aborting the mission entirely or continuing the mission once the need for a DPH assessment has passed.

RULE 12 (3.2.3) reflects the fact that it might, in the initial stages, be difficult to programme the ability to distinguish those directly participating in hostilities from those who are not. It is likely to be easier, however, to programme an AWS not to act, where it lacks information, and/ or intelligence regarding the nature of a potential target. Given that the AWS is in no mortal danger, an AWS must only act where it is absolutely certain of the nature of the target, and where taking action is not otherwise prohibited by international law.

RULE 13
A commander who is responsible for deploying an AWS to an environment where civilians, or belligerents are present, must ensure that AWS is capable of identifying an individual who is *hors du combat*.

RULE 13 (3.2.4) must be included due to the existing legal obligation to identify those *hors du combat*. Such individuals, being 'out of action' due, inter alia, to sickness, injury are protected against attack. *Hors du combat* status mat only be temporary. This is the case for example, to belligerents parachuting from a military aircraft in preparation to launching an offensive. An AWS must, therefore, be capable of identifying the status where it exists. Where they cannot, the commander must not deploy an AWS to an environment where civilians (who may have previously been directly participating), or human combatants are operating.

RULE 14
Where an AWS is deployed in a situation where a *hors du combat* assessment is required, and where that AWS does not have the capacity to carry out the required level of hors du combat assessment (or where there is no additional guidance from a third-party), the AWS must refrain from taking further action. This may be either aborting the mission entirely or continuing the mission once the need for an *hors du* combat assessment has passed.

RULE 14 (3.2.4) is required for the same reason as RULE 12. That is, an AWS must be programmed not to act, where it lacks information, and/ or intelligence regarding the nature of a potential target. Given that the AWS is in no mortal danger, an AWS must only act where it is absolutely certain of the nature of the target, and where taking action is not otherwise prohibited by international law.

RULE 15
AWS must never be delegated decision-making responsibilities regarding the authorization of nuclear launch.

RULE 15 (3.2.6) is directly linked to RULE 1. Due to the unique destructive power of nuclear weapons, there use will almost certainly have catastrophic humanitarian and environmental consequences. This is the case whether they are used lawfully or unlawfully. Consequently, all decisions regarding nuclear launch are strategic in nature, and must, therefore, remain in the hands of humankind.

RULE 16
Where L3AWS are delegated decision-making responsibilities regarding the authorisation of pro-active attacks, a human operative must identify and verify each individual military objective.

RULE 16 (3.2.7) applies to L3AWS, in other words, to command operating systems. The classification encompasses all autonomous armed swarms, which provide one of the most controversial of all the emerging autonomous technologies. In this instance RULE 16 represents a liberal interpretation of Article 51(4)(a) API. This helps to

ensure that where L3AWS are deployed offensively (that is pro-actively, and not re-actively), the commander or other individual responsible for authorising AWS deployments, must identify each legitimate target, and not deploy an AWS merely in the 'hope' that it is able to locate and destroy legitimate targets.

RULE 17
A commander may pre-authorise and deploy an AWS to attack a group of targets, and/ or type of target.

RULE 17 (3.2.7) is a reflection of existing practice in the realm of targeting. This means for example, that while a commander is prevented, for example, from treating a geographical location as a single target (See RULE 19) an AWS may be directed to attack a 'group' of targets, or a 'type' of target, that has been pre-identified by a commander.

RULE 18
When deployed in a pro-active manner an AWS must not employ a method or means of combat which cannot be directed at a specific objective.

RULE 18 (3.2.7) represents a direct reflection of Article 51(4)(b) API. This rule is not applicable to re-active deployments because where this is the case, there will clearly be a specified object to which the AWS is reacting.

RULE 19
A pro-active attack with the use of a Lethal AWS will be considered indiscriminate where the human operative responsible for authorising its use, treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects.

RULE 19 (3.2.7) restates the obligation that is contained within Article 51(5)(b) API, but with a specific emphasis upon AWS. Once again, there is no need to consider re-the active axis in relation to this rule.

RULE 20
Where a military force authorises L3AWS to direct human combatants to carry out pro-active attacks, the human military personnel must be made aware of the autonomous nature of the order and must also be permitted to refuse an order where he or she believes that there is a genuine reason to do so.

RULE 20 (3.2.7) is included to ensure the greatest level of meaningful human control (MHC) is kept over AWS. This is especially important with regards to L3AWS who can be responsible for instructing human combatants. Vitally, international law does not require for human soldiers to unconditionally follow all orders passed down to them from a commanding officer. Instead, he or she must routinely assess whether, for example, an order is clearly unlawful, or, inter alia, not of use for service. As a result, that concept is reflected by RULE 20.

RULE 21
Where a L3AWS is delegated decision-making responsibilities regarding the authorisation of pro-active attacks, a human operative must identify and verify each individual military objective. This principle applies to a L3AWS acting in a re-active manner, unless circumstances dictate that human authorization is not possible. Where such a situation arises, and providing acts are limited to those of a re-active nature, a temporary moratorium may be applied to this rule insofar as it is immediate and necessary.

RULE 21 (3.2.7) is an adaptation of previous rules, and as a principle, it is grounded in both the *jus ad bellum* and the *jus in bello*, and the need for immediacy and necessity. It is included because there is an implied responsibility to ensure MHC is kept over AWS, and particularly over those with a wide variation of delegated powers. However, even though MHC must be key, there will be instances where a L3AWS should be permitted to authorise a sequence of re-active attacks without first seeking human authorisation. This might be necessary, for example, in the event of a loss of communications which was entirely due to an act of aggression taken by an adversary (either lawfully or unlawfully), but where there is an imminent threat, and/ or risk to the civilian population.

RULE 22
L3AWS may authorise actions which have not been directly pre-defined by a human commander providing any action which is likely to result in permanent damage to objects adhere to the principle of distinction.

RULE 22 (3.2.7) distinguishes lethal attacks from non-lethal, and providing they are consistent with all applicable legal obligations, authorises the latter. On the face of it, this appears to extend the field of operation of AWS significantly. However, where no civilians or military personnel are present (and the act can therefore be considered non-lethal), the AWS must still be capable of distinguishing military objectives from civilian where a kinetic force is used - noting the discussion regarding cyber-attacks which constitute an Armed-Attack in the text supporting RULE 6. Note also RULE 19 which ensures that an AWS must not treat as a single military objective a number of clearly separated and distinct military objectives.

RULE 23
AWS may authorise indiscriminate non-lethal actions which have not been directly pre-defined by a human commander, providing no physical damage is caused, or where physical damage caused is temporary in nature.

RULE 23 (3.2.7) reflects current practice, and acknowledges that the development and deployment of systems such as autonomous Electro-Magnetic Pulse weapons (EMP) should be allowed to continue. This is important because an EMP (2.2.5.4) may, for example, be capable of neutralising an adversary's electrical communications system, without causing the physical collateral harms that are often associated with existing lawful kinetic attacks. Non-kinetic attacks that cause physical damage (i.e., cyber-attacks) are classified as lethal, regardless of whether a human is injured or killed. Thus, these must adhere to RULE 19. However, RULE 23 allows for indiscriminate attacks where no physical damage is caused, or where physical damage is only temporary (such as where a mobile phone reception, or television signals, are temporarily interrupted). This is applicable on both the offensive and defensive axes.

RULE 24
A L2AWS D may authorise attacks that cause damage to objects that have not previously been identified by a human commander. Such attacks must adhere to the principle of distinction.

RULE 24 (3.2.8) represents the fact that when an AWS is used in a defensive manner, a commander will not always know in advance the specific targets/ types of target / groups of targets it will be required to engage. Indeed, the very reason many existing weapons have a fully autonomous setting, is because human operators can become overwhelmed when they are beset by deluge of separate, but constant, attacks. The fact that many LAWS D/ L systems have existed for years is evidence that greater targeting leniency should be provided to AWS that are used in a defensive manner. This is perhaps particularly pertinent where AWS are used to protect combatants and civilians from otherwise unlawful applications of force (such as *jus ad bellum* acts of aggression).

RULE 25
L2AWS may authorise indiscriminate attacks where no damage is caused, or where damage to objects is only temporary.

RULE 25 (3.2.8) supports autonomous non-lethal, and non-kinetic AWS deployments as compared to non-autonomous existing alternatives that can cause lasting physical damage. For more guidance, please refer to rule 23.

RULE 26
Where an AWS is required to carry out a distinction assessment, but it is unable to do so, civilian status must be presumed, and the AWS must be capable of refraining from taking further action. An acceptable course of action may be aborting the mission entirely, or the AWS may continue its assigned mission once the need to distinguish has passed.

RULE 26 (3.2.8) reflects the IHL principle of distinction, as previously considered, specifically in RULES 10-12. However, RULE 26 also identifies the additional

obligations, as contained within Articles 50(1) API, and 52(3) API. The former of these two provisions provides that in the case of doubt, an individual must be presumed to have civilian status, while the latter ensures the same is appliable to civilian objects. RULE 26, therefore ensures that, at the very least, a moratorium must be placed upon all Aws deployments where it is unclear whether civilians, or civilian objects are being directly targeted. This applies both to lethal and non-lethal acts, and both in offence and defence.

RULE 27
AWS are prohibited from treating humankind as a target, type of target, or a group of targets.

RULE 27 (3.2.8) is central to the functioning of the *Template*, and indeed the guiding principles. It addresses one of the greatest concerns of opponents, who believe that an AWS could merely be programmed to identity, target, and engage individuals who belong only to a certain group. This may be, for example, all European males of a fighting age (e.g.,18-50). A commander may authorise an AWS to engage a particular group of combatants (RULE 17), e.g., those guarding a legitimate military target. But, killing individuals based upon a classification or category is clearly incompatible with the wider legal requirement to distinguish civilians, or those considered *hors du combat*. Rule 27 takes the wider ethical considerations into account as well.

RULE 28
IHL proportionality is applicable to AWS (noting that proportionality can be applied either by the decision-maker responsible for authorizing AWS deployments, or, by the AWS itself).

RULE 28 (3.3.3) is a further acknowledgement that IHL proportionality (the requirement for collateral damage assessments to be made where civilians are present) is applicable to AWS. This obligation is therefore grounded in the existing legal obligation arising from Article 57(2)(a)(iii) API, which is also CIL, and thus, universally binding. No existing AWS can undertake an independent assessment, and many believe they will never be. However, RULE 28 reflects the existing notion that a

commander, or other individual responsible for authorising AWS deployments, may, in some instances, lawfully rely upon their own assessments. This becomes more difficult when authorising the use of L3AWS and L4AWS, because the MHC becomes more difficult to establish. However, the guiding principles, being a reflection of international law, greatly restrict such deployments.

RULE 29
Where there is a possibility that the deployed AWS could continue to operate free from human coercion after the expiration of a commanders proportionality assessment, the AWS must be capable of doing so independently.

RULE 29 (3.3.5) is inherently connected to RULE 28. It is necessary because, at some point in future, AWS may become capable of conducting their own proportionality assessments. If this was possible, an AWS may be capable, for example, of changing its course of action because the actual situation on the ground is very different to that which was envisaged by the individual responsible for deploying it. Indeed, this is one of the reasons many believe the development of AWS should be allowed to continue.

RULE 30
A commander must consider proportionality on a case-by-case basis.

RULE 30 (3.3.8) represents the fact that the circumstances in which a commander will deploy AWS are highly contextual. Therefore, they must be capable of demonstrating that their own proportionality assessment was sufficient in the circumstances, or, that given the conditions, it was appropriate to deploy an AWS. However, a commander must not merely deploy an AWS without having regard of the prevailing battlefield conditions. This is the case regardless of whether a particular AWS is capable of making its own proportionality assessment.

RULE 31
Where a commander authorises the deployment of an AWS that is unexpectedly placed in a situation where a proportionality assessment is required, but where the AWS does not have the capacity to carry out such an assessment, (or where there is no additional guidance from a third-party) the AWS must refrain from taking further action. It may do so either by aborting the mission entirely, or by continuing the mission once the need for a proportionality assessment has passed.

RULE 31 (3.3.8) introduces an additional failsafe. As with the discussion regarding the principle of distinction, *ibid*, there will be instances where civilians are present that were not anticipated by the commander, and where that AWS is incapable of conducting its own collateral damage assessment. As previously (e.g., RULE 12), in such a situation the AWS must be programmed not to act.

RULE 32
When taking feasible precautions, a commander will need to take account of whether greater civilian harms would occur as a result of not deploying an AWS. Where this appears to be the case, he or she may, in the circumstances, be compelled to deploy the AWS.

RULE 32 (3.4.6) represents Article 57(2)(a)(ii) API which ensures a commander, or any other individual who is responsible for authorising AWS deployments takes all feasible precaution in choosing a means or method of attack. In doing so, they must choose that which avoids, or, as a minimum, minimises civilian harms. RULE 32 will be key to future AWS deployments. In short, this is because if AWS do reach their full potential and become more capable of adhering to IHL principles than human combatants, commanders will be obliged to use them.

7.4.5 Rules Stemming from the *jus in bello*: In sum.

The *jus ad bellum* is the *lex specialis* legal discipline that is entirely dedicated to governing the behaviour of belligerents in armed conflict. It does so to ensure that the civilian harms that occur because of war are avoided, or at the very least minimised. It is perhaps not surprising therefore that IHL contributes the greatest number of rules to

this legal framework for regulating AWS deployments. Primarily, the majority of the rules which were identified in the preceding section arise as a result of the existing obligations associated with the fundamental IHL principles of distinction and proportionality. However, the rules introduced in this section also greatly restrict AWS deployments of a strategic nature, and uniquely regulate the particularly controversial technology that is autonomous armed swarms (see annex iii and iv below). Finally, this section introduces RULE 27, a key obligation regarding emerging technologies, which represents an exclusive commitment not to treat humanity as a target.

7.4.6 Rules Stemming from International Human Rights Law.

RULE 33
Any State deploying AWS in armed conflict that is a party to the relevant IRHL treaties, must have regard to the obligations contained within those treaties. In addition, should any IHRL provision be regarded as customary in nature, then any states deploying AWS will be bound by that rule (subject to RULE 34).

RULE 33 (4.1.2) acknowledges that IHRL does not cease to operate in times of war. As a result, states party to IHRL treaties must continue to adhere to them when deploying AWS. In addition to recognising the importance of treaty obligations, RULE 33 also acknowledges the universally binding nature of customary international law (CIL). This, where a IHRL provision is generally considered to be CIL, states must adhere to it, regardless of whether or not it has ratified the codified obligation. It is, however, important to note that in some instances, IHRL obligations may be derogated from. Though this is not applicable to all obligations, including, for example, the Right to Life.

RULE 34
Rights conferred by IHRL are applicable to all AWS deployments. Where these rights are, however, incompatible with the *lex specialis derogat legi generali* of IHL, the latter must prevail over the *lex generalis* of IHRL.

RULE 34 (4.1.3) is a further acknowledgment of the principle that where there is a discrepancy, or a conflict, between IHRL and IHL, the more focused, specific, norms of IHL must be applied - before, and/ or instead of those of IHRL which are more generally applicable. The *lex specialis* must be applied to individual obligations, and not to an entire legal discipline. As a result, is that the argument that IHRL is not applicable to AWS deployments because IHL provides the more specific obligations is unfounded.

RULE 35
IHRL must be applied concurrently with IHL during both Non-International Armed Conflicts (NIAC) and International Armed Conflicts (IAC).

RULE 35 (4.1.4) represents the widely accepted view that IHRL treaties, and customary IHRL, *are* to be applied by militaries (as representatives of the state) when deploying AWS in conflicts that are of a non-international nature, and also those that are of an international nature.

RULE 36
IHRL is applicable in respect of acts done by a State in the exercise of its jurisdiction outside its own territory.

RULE 36 (4.1.4) is clearly, closely associated with RULE 35. It refers specifically to the extraterritorial application of IHRL. There is an existing debate as to whether a state must have regard of its IHRL obligations when conducting armed operations only within their sovereign territory (where they have a considerable influence and a high chance of ensuring IHRL is applied), or whether the IHRL obligations must also be applied when operating extraterritorially (where they may have much less of an influence, and very little chance of completely ensuring IHRL is applied). Nevertheless, as previously noted, RULE 36 represents the widely accepted view that IHRL continues to apply wherever an armed force operates, including where that is outside of their own jurisdiction. However, this is only where a state is operating in the

exercise of its jurisdiction, and where it has 'effective control' over individual(s) who are subject to its jurisdiction. This might, for example, be a Prisoner of War (PoW).

RULE 37
Where a State deploys AWS extraterritorially, and they are a party to the relevant IHRL treaties, they must have regard to the obligations stemming from those treaties.

RULE 37 (4.1.4) is, once again closely related to the previous rules. In this instance, however, it specifically refers to AWS and the temporal and geographical application of IHRL. Temporal application means that IHRL is applicable at all times, including as previously noted, when AWS are deployed during war. A key point to note here however, that unlike IHL, IHRL is also applicable when states deploy an AWS outside of armed conflict. Geographic application means that states must have regard of IHRL wherever they deploy AWS, whether within their own jurisdiction, or whether extraterritorially .

RULE 38
AWS are not prohibited from conducting signature and targeted strikes on the high seas or in international airspace when acting in furtherance of the State operating under its inherent right to individual or collective self-defence (as per article 51 UN Charter).

RULE 38 (4.2.5) refers specifically to so the use of so-called Hunter-Killer drones, i.e., those AWS that are deployed for the sole purpose of searching for, and engaging either a pre-identified individual, or an individual who is behaving in manner which identifies them as an adversary. However, while these types of attacks are not unlawful under international law, this is only the case when the AWS engages such targets when they are not in the territory of a third-party state, and only when the need to act is s instant, overwhelming, with no choice of means, and no moment for deliberation. In reality this greatly restricts how and where hunter-killer drones can be used.

RULE 39
AWS deployments are unlawful where they breach the sovereignty of a third-party state - that is, where they enter the sovereign territory of a state without consent.

RULE 39 (4.2.5) is primarily (although not exclusively) applicable to hunter-killer drone operations. It identifies that unless a third-party consents a state deploying an AWS in their territory, the use of a hunter-killer drone would be breaching the sovereignty of the third-party, and would, therefore, be an unlawful deployment.

RULE 40
Where AWS locate members of an enemy military or paramilitary that are taking refuge in a neutral state, the neutral state must be given an opportunity to expel those members from its territory before the AWS can lawfully apply force.

RULE 40 (4.2.5) acknowledges that extraterritorial AWS deployments could potentially be lawful if they operate within the boundaries of the concept of neutrality. Neutrality refers to a state that is not a party to an armed conflict, and one that is not an ally of a party to a conflict. And, while RULE 39 identified that a neutral state must consent to AWS deployments for them not to be considered a breach of sovereignty, RULE 40 identifies a caveat. In short, a state may lawfully breach the sovereignty of a neutral state in order to expel combatants that have entered its territory. But, while this appears to open the door to AWS deployments, their use is still likely to be considered unlawful. Primarily, this is due to the fact that a neutral state has an obligation to expel all belligerents that have taken refuge in its territory. And, moreover, the neutral state must be given a chance to do so before its sovereignty can be breached. As a result, an AWS could not simply follow a targeted individual over a border into a neutral state and engage them. Indeed, this RULE significantly restricts, rather than enhances hunter-killer-drone operations.

RULE 41
Pre-emption is not a recognised form of self-defence. Thus, this cannot be utilised to support the use of AWS for conducting extraterritorial targeted strikes. Minus an alternative lawful exception, any extraterritorial act of eliminating an individual based either on pre-identification or, upon a set of pre-programmed behaviours and/ or characteristics, is a breach of IHRL obligations, not least Article 6 ICCPR.

RULE 41 (4.2.5) refers, once again to AWS deployments on the defensive axis. Two primary forms of lawful self-defence are recognised. These are (i) collective and individual self-defence in response to an armed-attack, and (ii) collective and individual self-defence in response to an 'imminent' armed-attack. As previously noted, in order for the latter to be considered lawful a state must have exhausted all non-forcible measures, and must only act where it would be wholly unreasonable to expect the responding state to attempt a non-forcible response. As a result, the third, and generally unsupported notion of pre-emptive self-defence cannot be used as a basis for AWS deployments. Where it is, IHL is not applicable. Thus, for example, the killing any individual would breach the right to life and would likely be considered murder.

RULE 42
Commanders, and all other individuals, are prohibited from deploying AWS for the practice of extraterritorial targeted killings – other than when they operate within an operational and clearly defined battlefield.

RULE 42 (4.2.6) is the culmination of the previous RULES relating specifically to hunter-killer drones, which is an inherently controversial use of autonomous technologies. Indeed, the impactions of deployments outside of an existing battlefield, autonomous or otherwise, are so far-reaching that only the strictest level of MHC should be applied to their operation. This can only be achieved by ensuring a human is kept on, or in the loop, of all decisions relating to extraterritorial targeted or signature strikes. This does prevent a commander, using a hunter-killer drone to search for, locate and engage, pre-identified targets upon an existing battlefield.

RULE 43
Where an AWS is deployed to a location that is not an operational, and/ or clearly defined battlefield, lethal force must only be employed in situations where less extreme means are insufficient to achieve the mission objectives. In any event, intentional lethal force must only be used when strictly unavoidable in order to protect life.

RULE 43 (4.2.7) reflects the fact that minus an armed-conflict, and/ or a legitimate act of self-defence, neither IHL, nor the UN Charter is applicable. In such an instance, IRHL is the sole body of law that is applicable to AWS deployments. RULE 43, therefore, is also a reflection of Principle 9, of the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials. In itself it is a non-binding obligation. Nevertheless, it is still a manifestation of a widely accepted and practiced principle.

RULE 44
The use of lethal force that is consistent with IHL and other applicable international law norms is, in general, not considered to be an arbitrary use of force.

RULE 44 (4.3.4) ensures that the guiding principle reflect the certainty that, in contrast to RULE 43, there is no requirement under IHL, for an AWS to apply a minimum level of force upon an existing battlefield. Therefore, lethal force, when considered lawful under the *lex specialis* of IHL, is not considered arbitrary, and so is not applied in breach of IHRL obligations.

7.4.7 Rules Stemming from International Human Rights Law: In Sum

This section introduced 12 rules which have their foundations in IHRL. Though on some instances the identified obligation arises from either the *jus ad bellum* or the *jus in bello*. Central to the rules arising from IHRL, is the fact that IHRL norms are not limited either temporarily of geographically. And, as a result they must be adhered to where and when states (and their representatives) operate upon battlefields. However, since IHL is the body of law which has the specific task of governing the actions of

belligerents in armed conflict, it must be seen as the *lex specialis derogat legi generali* which is applicable over the *lex generalis* of IHRL when there is a bifurcation of legal obligation. Many of the rules identified in this section are applicable primarily (although not exclusively) to hunter-killer drones. And, as a result, the guiding principles greatly restrict autonomous deployments of this particularly controversial method of targeting an adversary.

7.4.8 Rules Stemming from Ethics, Including Those Originating from Ethical Clauses Contained Within Legal Treaties.

RULE 45
Every L2AWS and above, must be fitted with an aircraft style 'black box' to record its decision-making behaviours. Where elements of an AWS are not EAI, their decision-making processes must nevertheless be recorded for future access and monitoring.

RULE 45 (5.1.3.2) is included because one of the key arguments against AWS is that is often difficult to identify how or why an Artificial Intelligence (AI) reaches its conclusions (i.e., its decisions to act in a certain way). This is particularly the case with AI systems which can adopt one of several methods of machine learning, as opposed to those which operate according to fixed, predefined, parameters. AI is still in the relatively early stages of development. Consequently, early AWS are likely to continue to operate according to the latter (such as the U.S. Navy's PHALANX - a fixed position, defensive system that is programmed only to identify and engage immediate threats where the human supervisor is overwhelmed by the scale of the attack).

However, as AWS become more capable of learning from their environments, and of adapting their operation as a result, it is vital that those responsible for authorising their use remain as informed as possible. Access to a machines historical decision-making processes is equally important for those who might be responsible for assessing AWS actions retrospectively. This may be an international court, or it could be a committee or other such body that is created to monitor compliance with the legal framework for regulating the use of AWS like those that are used in IHRL. And, although the requirement for a black-box is not strictly a legal requirement, it is likely to prove

invaluable when looking to assign accountability where an individual is a fault – be they a civilian programmer, or military commander.

RULE 46
A state (or its agent, such as a commander) must only deployed AWS where there is a reasonable, or more than reasonable chance of mission success.

RULE 46 (5.1.6.2) is grounded in the just war theory concept of reasonable chance of success. And, therefore, it is not necessarily a representation of an existing legal obligation. However, it is strongly linked with both *jus ad bellum*, and *jus in bello* provisions. In the first instance, RULE 46 is included as a counterbalance to the claim that the use of AWS will lead to a derogation of Article 2(4) of the UN Charter (2.1.3-2.1.11). Moreover, it is also closely related to Article 57(2)(a)(i), and Article 57(2)(a)(ii) API, and to the *jus in bello* concept of the 'reasonable military commander' (3.3.6). This was identified by the International Criminal Tribunal for the former Yugoslavia, but the specific point here is, those responsible deploying AWS must not do so to either to enter, or to fight a conflict, where they have little chance of winning, but where no humans will be harmed.

RULE 47
Should the development and use of a new AWS appear to be unaccounted for by existing legal treaties or established custom, the Aws development and use must be consistent with the Martens Clause, and specifically, the principles of humanity and the dictates of public conscience.

RULE 47 (5.2.2. 6) is an acknowledgment of the, albeit limited, applicability of the Martens Clause, and its modern interpretation contained in Article 1(2) API. In each case, there is a clear indication that both the principles of humanity, and the dictates of public conscience need to be considered should codified and customary law fail to account for AWS. As is implicit in the guiding principles contained herein, international law does already prescribe for AWS deployments. Nevertheless, RULE 47 provides a futureproofing mechanism. And, in doing so ensures that Article 1(2)

API must be adhered should there be future instances where this is not the case - notwithstanding the ambiguous nature of both terms.

7.4.9 Rules Stemming from Ethics, Including Those Originating from Ethical Clauses Contained Within Legal Treaties: In Sum.

This section has introduced three additional rules for regulating the use of AWS that stem, not necessarily from positive law, but from just war theory and ethics. Those rules which have been included do, however, have legal connotations. It is only for that reason that they are included. The field of ethics certainly has an important role to play in the continuing discussions regarding AWS. And those considering lending their support to a legal framework for regulating AWS may wish to include a greater reference to such concerns. As a result, these guiding principles are not necessarily intended to be exhaustive. Nevertheless, the three rules that this section has identified, can help to ensure that AWS are deployed in an ethical manner.

7.4.10 Rules Stemming from Additional Sources, but Which Regard Accountability.

RULE 48
Where the commander believes the AWS would be deployed into an operating environment which could be problematic, he must make the decision not to deploy the weapon whatever advantages it may appear to offer over an alternative non-autonomous variant.

RULE 48 (6.2.4) reflects the concept of *Command Responsibility*, and it is included as a method for ensuring that an individual can be accountable should an AWS commit a war-crime. It is vital to note that there is no absolute requirement in international law for accountability to be assigned. As a result, RULE 48, and those which ensue, are not strictly legal obligations. One primary advantage with adopting *Command Responsibility* to ensure accountability, is that is creates a natural limitation on AWS deployments. This is likely to happen, because in each situation, an AWS operator is obligated to consider the potential repercussions of autonomous deployments, even where on the face of it, the deployment of non-autonomous weapon would be less

beneficial to the overall military campaign. C*ommand responsibility* is the logical step for imposing accountability upon the individuals in charge of deploying AWS, not only because commanders (and their supporting staff) must be proficient in operating the system, but also because they have the most to gain from using it. And, a sufficiently well-informed commander, supported by a suitable command structure (which may have to include legal specialists), is capable of closely monitoring the behaviour of AWS, and of monitoring the evolving battlefield when considering every decision to deploy an AWS.

RULE 49
A dedicated command structure must, at the very least have the potential of overriding all AWS that are deployed at the operational and executive level.

RULE 49 (6.2.4) is included as a method of ensuring MHC is kept over L3AWS and L4AWS. However, where munitions and platforms are manifested as elements of such systems, it is also applicable to them. Note that these general principles, alongside all wider international law obligations, can ensure that MHC is kept over L1AWS and L2AWS deployments where they are used tactically. This override system is directly linked to RULES 3 and 4, which require appropriate levels of user training, and the capability for AWS to receive real-time battlefield updates respectively. RULE 49 simply offers an extra layer of protection. The point here, is that the commanders support structure must be capable of monitoring AWS deployments, and of recalling or aborting the mission if thing do go awry, of the battlefield condition alter significantly. This is in reaction to the claim that robots may 'going rogue', or intentionally deny orders, which is already doubtful given that these are arguably inherently human behaviours.

RULE 50
Accountability for developing, deploying, and using AWS must be ensured in accordance with international law, including through the operation of such systems within a dedicated command structure (subject, inter alia, to RULE 2).

RULE 50 (6.2.4) is a representation, although a slight adaption, of the GGE's guiding principle (d) regarding accountability. Although it is very closely related to those rules already considered, RULE 50 adds the explicit obligation for a command structure to be in place where a state has access to AWS.

RULE 51
If a state deploys an AWS without a dedicated command structure, and a violation of the laws of war occurs due to the act of an AWS, senior commanders and civilian leadership are potentially accountable for the omission.

RULE 51 (6.2.4) ensures that senior military staff and/ or civilian political leaders (and others who are responsible for taking the strategic decision to develop and deploy AWS), cannot escape accountability for a war crime that was committed by an AWS where they have neglected to put a dedicated command structure in place. As previously noted, there is, however, no absolute requirement to assign accountability under international law. Thus, where a command structure is in place, and there is no sign of a commander acting either unlawfully, or recklessly (6.2.5), there is arguably no case-to-answer. While this is controversial, it is a direct translation of existing practice. States may wish to support further rules regarding accountability, such as strict liability in tort. Note, however, that such discussions are not international in nature, and are, therefore, they are extraneous to the guiding principles offered herein.

7.4.11 Rules Stemming from Additional Sources, but Which Regard Accountability: In Sum.

The previous section introduced four rules for ensuring an individual can be held to account should an AWS 'commit' a war-crime. Because there is no absolute need to assign accountability under international law these rules more generally reflect the ethical need to do so, as has been identified by the GGE. The rule identifies all reflect the concept of *command responsibility*, and identified that with the support of the *Template*, this existing military practice can be utilised to ensure there is not generally an 'accountability gap'. There are certain benefits to adopting this method of assigning accountability, not least that it provides a natural method for ensuring commanders are hesitant when authorising AWS deployments, not least AWS such as hunter-killer

drones. These rules also help to ensure MHC is kept over AWS deployments, including L3AWS and L4Aws which have the potential to operate at a great distance from those responsible for authorising their use, both temporally and spatially.

7.5 Chapter Conclusion.

Chapter Seven is the result of a comprehensive analysis into the lawfulness of AWS deployments. Initially, the chapter provided a background to the guiding principles - the researchers legal framework for regulating AWS deployments – before both the general definition and the *Template* were re-introduced. This reintroduction was necessary because the framework must be capable of operating as a standalone instrument. The framework is constructed, primarily, by utilising existing international obligations. But it has been demonstrated to be capable of restricting AWS deployments where they are not only lawfully problematic, but ethically problematic too. Importantly, the framework is future-proof because it can adapt with technological developments, it being able to allow for increasingly advanced AWS to be deployed as they become more capable, without the need for re-negotiation.

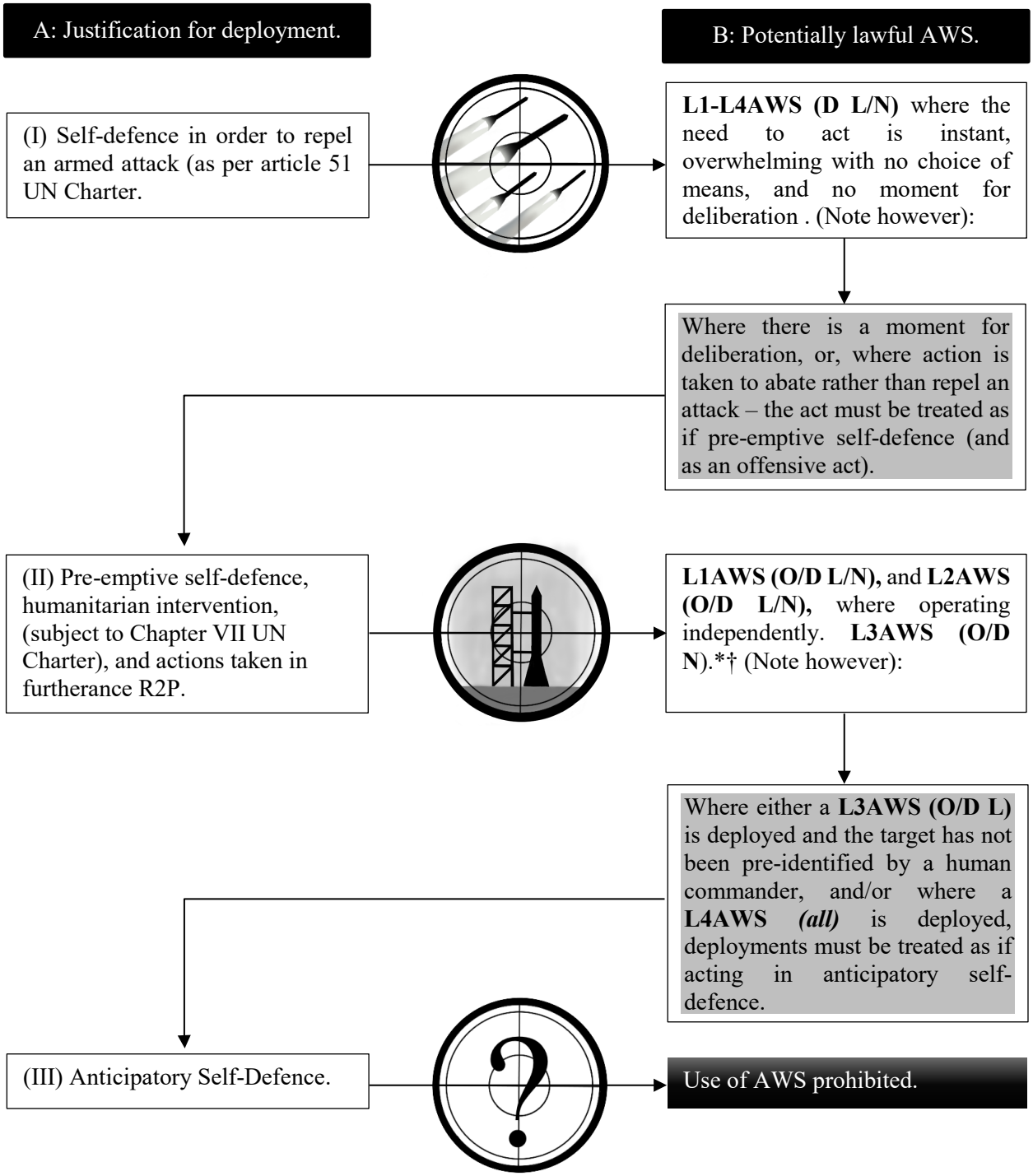
The Guiding Principles identified above are presented by way of a soft-law apparatus, often referred to a 'manual'. These are commonplace, and though they are not legally binding, they are highly influential. [1235] Indeed, if enough states were to observe and absorb these rules into national guidelines and Rules of Engagement (RoE), it is possible that they might ultimately be recognised as customary international law and become binding in their entirety. [1236] Although comprehensive and utterly groundbreaking, the framework provided above is not intended to be exhaustive. States may wish to annex additional rules stemming from ethics, or in relation to accountability. Moreover, given the potential impact of AWS, the researcher believes that the framework should be supported by an UN Committee to enforce adherence, and a dedicated UN special rapporteur. Both should be given unlimited access to states AWS development and research information, and to 'black box' recordings to ensure

[1235] Consider, for example, those referred to by the present researcher throughout this body of research, Tallinn Manual, *ibid*, n.382, ICRC Customary Rules, *ibid*, n.518, and, ICRC DPH Guidance, *ibid*, n.558.
[1236] See generally, Boothby, *ibid*, n.122, Chapter Three. However, in particular, see the discussion at pp.87-91.

compliance to the framework, and accountably where necessary. Indeed, Signatories to the framework should be compelled to respond to any such request for information.

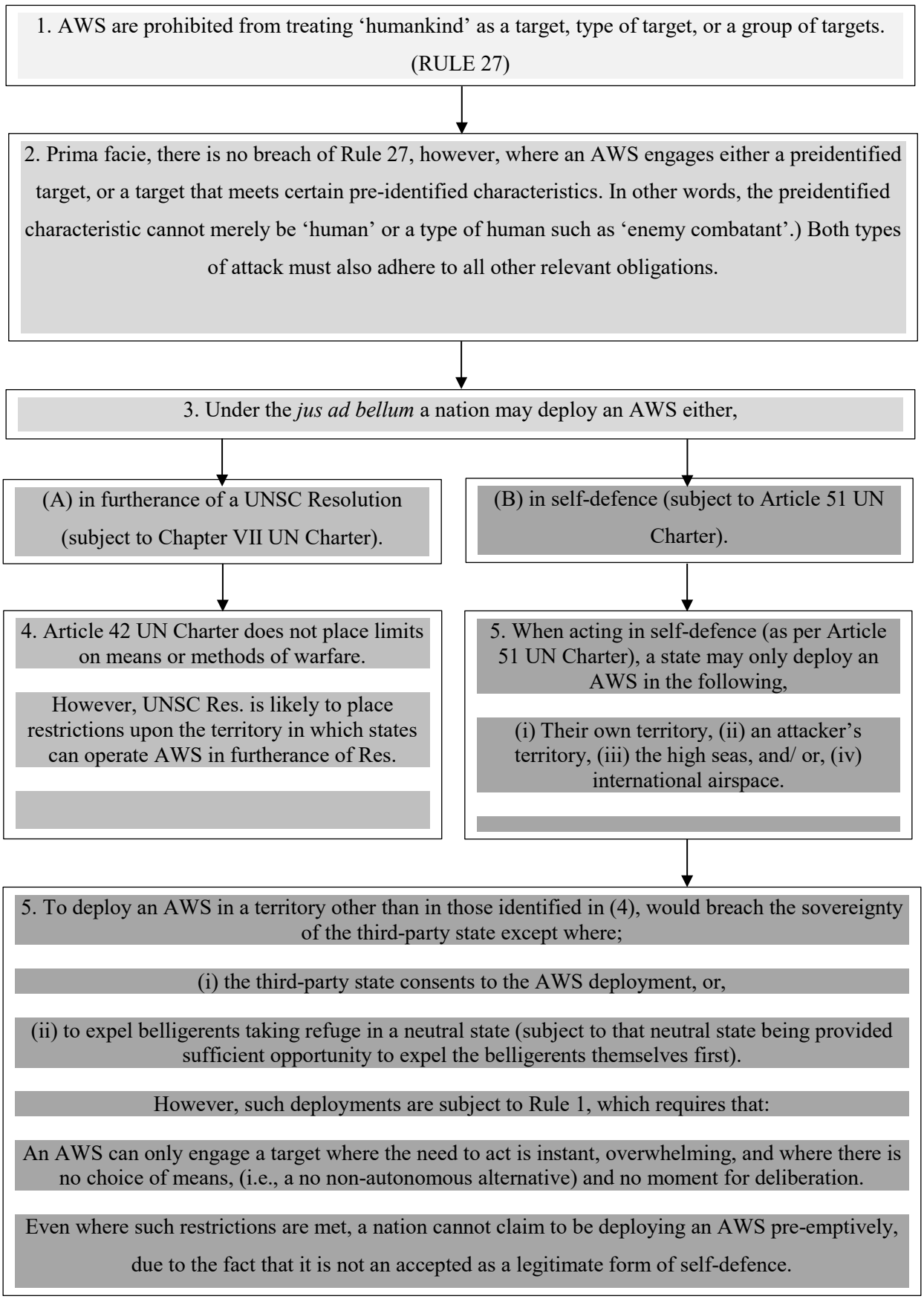
(cont.)

Annex I (a) (*Figure 26*): A Summary of the Lawfulness of Autonomous Weapons Systems Deployments Under the *jus ad bellum.*



* Providing a specific target/ type of target/ group of targets has been pre-identified and authorised by a human commander, † Noting lethality refers only to potential, not an actual resulting harm(s). Lethal weapons are those which are either anti-personnel (including those which target manned or piloted platforms such as aircraft and naval vessels), and/ or those which target uninhabited military objects, but which are deployed in a manner which is potentially injurious to civilian life.

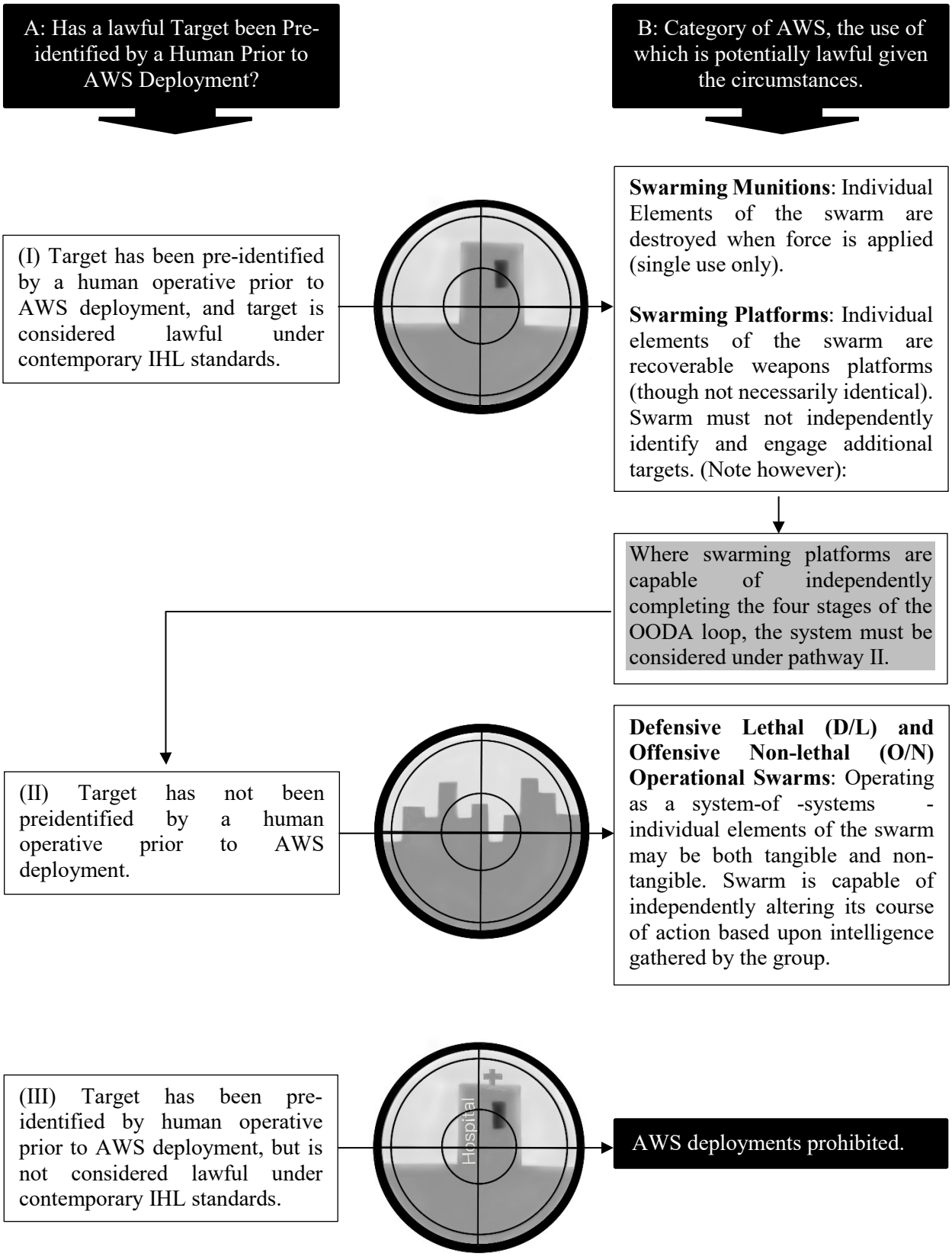
Annex I (b) (*Figure 27*): The Lawfulness of Autonomous Hunter-Killer Drones Under the *jus ad bellum*.



Annex II (a) (*Figure 28):* A Summary of the Rules Relating to the Principle of Distinction and the Use of L3AWS Including Autonomous Swarms.

L3AWS	Defensive Axis [D]	Offensive Axis [O]
LETHAL [L]	• A temporary moratorium may be placed upon the rule requiring human identification and verification of objectives where human authorization is not possible under the prevailing circumstances.	• A human commander must identify and verify targets. • Commander must not employ a method or means which cannot be directed at specific objective. • A specific objective is NOT a number of clearly separated & distinct objects. • Where a L3AWS provides order to humans, those humans must be made aware of autonomous nature of the order and be permitted to refuse such an order if necessary.
Non-Lethal [N]	• L3AWS may authorise attacks that cause damage to objects that have not previously been identified by a human commander providing they adhere to distinction. • L3AWS may authorise indiscriminate attacks where no damage is caused, or 'damage' to objects is only temporary.	• L3AWS may authorise attacks that cause damage to objects that have not previously been identified by a human commander providing they adhere to distinction. • L3AWS may authorise indiscriminate attacks where no damage is caused, or 'damage' to objects is only temporary.

Annex II (b) (*Figure 29*): Regarding the Lawfulness of Swarming AWS Under the *jus in bello.*



CHAPTER 8. THESIS CONCLUSION.

In his provocative 2007 Article Professor Robert Sparrow introduced the concept of *Killer Robots*.[1237] His argument was predominantly grounded in ethics, but it nevertheless established a variety of reasons as to why the use of these Autonomous Weapons Systems (AWS) in armed conflict is particularly controversial.[1238] Primarily, the contention arises due to the fact that on some level AWS (a compound of the latest robotic technologies and Artificial Intelligence (AI)), will be delegated life-or-death battlefield decision-making responsibilities. As well as being particularly insightful, Sparrows discussion was therefore hard-hitting. And a multifaceted, though initially limited, debate ensued. Issues regarding the *lawfulness* of AWS deployments was brought to the wider public's attention in 2012, when Human Rights Watch (HRW) (in collaboration with the International Human Rights Clinic at Harvard) published their first of a number of reports on the subject – Losing Humanity: The Case against Killer Robots.[1239]

Since the release of the first HRW report, the body of literature regarding the lawfulness of AWS has grown considerably. And, from it, two predominant lines of argument have emerged. On the one hand, those in opposition to AWS are *imploring* the United Nations (UN) to prohibit AWS deployments by way of a new Treaty because of their unique ability to act without what is referred to as *Meaningful Human Control* (MHC).[1240] According to such opponents, AWS will be inherently unlawful, not least because they will be incapable of adhering to the International Humanitarian Law (IHL) principles of distinction and Proportionality.[1241] On the other hand, a number of leading commentators have argued that *existing* international legal provisions are more than adequate to cater for the introduction of increasing advanced autonomous technologies, and moreover that although novel, AWS *must* be treated like any other weapons system.[1242]

[1237] Generally, Sparrow, *ibid,* n. 15.
[1238] *Ibid.*
[1239] HRW (2012), *ibid,* n.15..
[1240] FLI, *ibid*, n.7.
[1241] Generally, e.g., HRW (2012), *ibid,* n.15, HRW (2015), *ibid,* n.191, Grut, *ibid*, n.506, Heyns, *ibid*, n.180, Asaro (2012), *ibid*, 317.
[1242] Generally, e.g., Schmitt, *ibid*, n.42, Sassoli, *ibid,* n.39, Dunlap, *ibid*, n.1129, Crootof, *ibid*, 284.

A potentially fatal complication with both of these lines of enquiry, however, and indeed with all of the other variants that lay in-between, is that they do not sing from the same *song-sheet.* There is currently no precise definition of AWS,[1243] and consequently it is not always clear, despite various attempts to elucidate, to which type of weapon a contributor is referring to. For example, while some believe that only lethal AWS should be the main focus of the enquiry (disregarding non-lethal AWS),[1244] others believe that defensive systems should also escape further scrutiny.[1245]

In addition, while some argue that AWS already exist, this is far from a widely supported opinion (though it is one which the present researcher has adopted).[1246] Nevertheless, the result is that the existing debate regarding the lawfulness of AWS, though wide-ranging, is fractured, inconsistent and often difficult to decipher. And, although the UN has convened a Group of Governmental Experts (GGE) to conduct an analysis of emerging AWS,[1247] its progress has been particularly hampered.

In the post 9/11 military climate, however, there has been a significant change in the character of warfare which has seen huge increases in the militarization of robotics and AI, and developments have continued to come thick and fast.[1248] Furthermore, the world's most technologically advanced nations show no sign of slowing their research and development (R&D) in this area, or, of supporting an new prohibitive treaty.[1249] This should perhaps come as no surprise, given that some are keen to emphasize the strategic *importance* of maintaining a technological superiority over ones adversaries.[1250] However, while a number of institutions an organisations do highlight the need for a greater understanding of the legal issues surrounding AWS, certain militaries are advancing their autonomous arsenals with relatively few legal guidelines in place to regulate their development and deployment.

[1243] See e.g., Crootof, *ibid,* n.5, Horowitz, *ibid*, n.12.
[1244] Hence the designation LAWS as opposed to AWS. See e.g., HRW(2012), *ibid,* n.15, Heyns, *ibid*, n.180,
[1245] See, FLI, *ibid,* n.7. The Open Letter also refers to offensive AWS only.
[1246] See e.g., Horowitz, *ibid,* n.196, 25, Scharre, *ibid*, n.20.
[1247] See, CCW, *ibid,* n.84.
[1248] Note the discussion at pp.5-8. It notes the first time a UAV (no doubt a predecessor of future AWS) was used to carry out a precision strike was on 7 October 2001, in Kandahar, Afghanistan. It also identifies that today, at least 19 states are operating armed drones, and a number of NSAG are too.
[1249] See, n.24 which provides a list of 30 states, noting that China is an exception because though they support on a ban on the use of AWS, they do not support a prohibition or moratorium on their Research and Development.
[1250] Schmitt and Thurnher, *ibid*, n.38, 232.

This thesis changes that. For the first time, this body of research contributes a comprehensive analysis of *all* of the legal issues relating to AWS, in a single examination, and according to the same set of *rules.* In other words, unlike all other investigations, this thesis sings from the same song-sheet throughout. This is a unique accomplishment which has been made possible due primarily due to the ground-breaking definitional tool that has been referred to throughout this project as the *Template.* This was developed in Chapter One, and it has provided an unparalleled system for classifying AWS. Somewhat importantly, the *Template* is a manifestation of the first of the thesis' three primary objectives which were set out in the introduction.

A general definition was offered by the author in Chapter One. This was achieved by breaking down and analysing the constituent parts of AWS, namely, (i) autonomy, (ii) Weapons, and (iii) weapons systems. These independent concepts were then re-constructed in order to provide the following:

An AWS is an AI or EAI [Embodied AI], or a combination of systems, that is designed to apply lethal, or a non-lethal force to combatants and/or military objects. Following its activation, an AWS must have a degree of flexibility as to how it completes the four tasks assigned by the OODA loop, while remaining free from human coercion - though not necessarily from human supervision.

This definition takes account of a number of factors, not least the importance of having regard for non-tangible AWS, in other words cyber-weapons, as well as more tangible robotic AWS. And, somewhat crucially, by incorporating John Boyd's influential OODA loop (Observe, Orient, Decide, ACT) it also identified that despite what many experts proffer, AWS already exist. This definition is, therefore, *still* a useful tool. However, though it has, for example, provided a more than suitable method of comparing a number of alternative definitions of AWS in Chapter One, that analysis also identified it primary weakness. In short, this is that general definitions are inherently too vague, and too imprecise to be utilised as a method for identifying whether or not a *particular* AWS, or the use thereof, can be considered lawful.

Given that at the heart of the thesis' second primary objective is a requirement to provide a means for identifying individual AWS, this clearly had to be overcome. But in order to do so the investigation needed a depth of definition that the literature had

previously lacked. The Template overcame this, and filled the definitional lacuna. And, vitally, it takes account of the weaknesses in the existing debate as identified above. This was achieved, in first instance by considering the contributions of one leading AWS expert, Michael C. Horowitz. Chapter One built upon Horowitz's suggestion that AWS should be classified according to weapon types. And, from it, 4 types of AWS were distinguished. These have also been referred to the levels of autonomy.

Chapter One identified level 1 AWS as munitions. These are predominantly, but not exclusively, used at the tactical level. They are defined as, *Single use systems which, once activated, are capable of identifying, selecting and, engaging targets (or not) free from further human coercion, though not necessarily from human supervision*. Level 2 AWS are identified as weapons platforms, which can be deployed at the tactical level, but can also be used at both the operational and even the strategic level. These are defined as, *Recoverable systems which, once activated, are capable of identifying, selecting and, engaging targets (or not) free from further human coercion, though not necessarily from human supervision*. Level 3AWS were identified as command operating systems and defined as, *Systems which, once activated, are capable of operational level decision-making regarding battle planning and, of directing other systems accordingly (including human combatants).* L4AWS operate at a strategic level. These were identified as executive operating systems, and defined as, *Systems which, once activated, are capable of strategic level decision-making (such as whether to resort to armed conflict*).

A classification system such as this, clearly goes a good way further than any general definition such as the one posited above. However, although this 'axis' does incorporate an additional level of autonomy to that provided by Horowitz, it is still incapable of taking into account the circumstance in which individual AWS are used. The *Template* therefore considers the context of individual AWS deployments on two additional axis. These positive additions arise directly from a negative – that is, the lack of clarity in the existing debate. Nonetheless, by incorporating the primary bifurcations into the classification model, the *Template* is lent an element of lucidity which notably distinguishes it from all previous definitional attempts.

The second axis by which the *Template* therefore classifies AWS, is with regard to the manner in which each weapon is deployed – offensively, or defensively ([O]/[D]). This

is vital, not least, because international law treats each concept very differently. The third, and final axis that was introduced in Chapter One, regards the matter of lethality. And, though this axis intrinsically accounts for kinetic and non-kinetic applications of force, its core function is to distinguish personnel attacks, from attacks on objects devoid of humankind ([L]/[N]). This is an essential differentiation, not just because the literature is undecided, but because in certain circumstances international law may also treat each attack dissimilarly.

In Chapter Two, the *Template* formed the heart of the analysis of regarding the lawfulness of AWS under the *jus ad bellum,* this being the first of three international legal disciplines that is relevant to the use of AWS in armed conflict. The *jus ad bellum* analysis was broken down into three parts. The first examined whether the proliferation of AWS is likely to lead to a derogation of Article 2(4), which is a provision that has achieved *jus cogens* status.[1251] While the second considered the use of AWS according to the primary treaty exception to the threat or use of force, the inherent right to self-defence contained with Article 51 of the UN Charter. The primary consideration in that examination was is whether the use of AWS is compatible with the *jus ad bellum* principles of necessity and proportionality. In the final Part, Chapter Two considered the lawfulness of AWS according to two further concepts. The first of those being the authorization of force subject to United Nations Security Councils (UNSC) Chapter VII powers,[1252] and the second being the soft-law international agreement on the Responsibility to Protect (R2P).

In the first instance, the four levels of AWS were considered independently, and also according to the additional two axes. In this regard scenario 1 provided both context and an element of authenticity to a discussion, which, like many that undertaken throughout the analysis, was unapologetically future-looking. After conducting a comprehensive analysis, however, and after distilling the first of the 50 GPs identified throughout the thesis, several weaknesses were revealed in the derogation argument. Ultimately, however, this analysis demonstrated that a derogation of Article 2(4) UN Charter cannot be cited as a reason supporting a prohibition, not least due to the

[1251] See, *Furundzija Case*, *ibid*, n.310, para. 153. Also see generally e.g., Green, *ibid*, n.310, and Grimal and Sundaram, *ibid*, n.296, 10.
[1252] In particular see, arts. 39-42 UN Charter, *ibid*, n143.

paradoxical nature of seeking to promote a new treaty to enforce an existing legal provision which is already attained jus cogens status.

Once again with the help of a hypothetical scenario, the Part 2 examination also found fundamental weaknesses in opponents arguments. Nevertheless, this section did provide a number of rules for regulating AWS deployments, and for example, for differentiating between AWS where used for repelling and abating purposes. However, at the heart of this discussion was the fact that while certain AWS deployments could be identified as unlawful, they regarded the weapons use, and not the lawfulness of the AWS itself.

The final examination in Chapter Two considered the use of AWS in light of the two interventionalist concepts of R2P and Humanitarian Intervention (HI) – two central tenets of the *jus ad bellum*. Once again, however, while the Part 3 analysis was able once again to distinguish lawful deployments from unlawful deployments, it could not provide any evidence to support the theory that AWS should be prohibited due to the fact that they are inherently unlawful. As a result, Chapter Two concluded that while existing *jus ad bellum* principles will have a significant influence over the conduct of present and future autonomous military operations, the *jus ad bellum* supports the authors hypothesis that regulation of AWS is required as opposed to a prohibition.

Chapter Three considered the second relevant legal discipline, *jus in bello,* otherwise referred to as International Humanitarian Law (IHL).[1253] This second pertinent legal discipline seeks, fundamentally, to limit the negative effects of war. As previously noted, much of the early discussion relating to the lawfulness of AWS was grounded in IHL,[1254] and many of those seeking to prohibit the development and deployment of AWS are still skeptical as to whether these weapons could ever be capable of operating in accordance with its core principles – distinction and proportionality.[1255] Part 1 of Chapter Three therefore identified the fundamental IHL principles, and the

[1253] Noting the jus in bello, or IHL is also referred to as LOAC.
[1254] See, e.g., HRW(2012), *ibid*, n.15. The report is predominantly grounded in the claim that future AWS will not be capable of complying with IHL. For a useful retort, however, see generally, Schmitt, *ibid*, n.42.
[1255] Noting that the legal obligation to consider distinction and proportionality is also referred to as the law of targeting or targeting law.

circumstances in which it applies. Importantly, this analysis identified that the GGE have already noted that AWS must continue to remain the subject of IHL.[1256]

Part 2 then considered these principles alongside the introduction of AWS, to see if they can be utilised to support the calls of those calling for a prohibition. Once again, a scenario was introduced to add context and authenticity to the discussion. And, individual AWS, existing and future, were considered according to the *Templates* three axes. Nevertheless, although additional GPs for regulating AWS were identified, this analysis demonstrated that even where Aws were incapable of operating with distinction and proportionality, as a concept, they still cannot be displayed to be inherently unlawful.

Chapter Three identified that greater analysis is required in regard of IHL concepts such as Direct Participation in Hostilities (DPH), and hors du combat. And also, that the developers of AWS have some way to go until Aws will be capable of operating in full adherence with them. However, where there are lacunas in this area, they are not limited to Aws, but relevant to all military operations. As a result, though more investigation is required, it was beyond the realm of this thesis. Chapter Three also considered the concept of the reasonable military commander, as identified by the ICJ in *Galic,*[1257] the subjective nature of which opponents of AWS believe cannot be programmed into an AWS.

This examination, however, identified that subjectivity in this regard is not necessarily a good thing – it potentially leading to irregularities in the application of AWS. Moreover, when *command responsibility* is considered, the state of mind being 'judged' should be the individual responsible for authorises the use of AWS, not the AWS itself. The Part 3 analysis considered the *concept* of military necessity. Though this identified that where this is used as a ground for supporting the prohibition it is merely a repurposing of the proportionality argument – the weakness of which the chapter had already demonstrated.

The final IHL investigation, regarding the duty to take precautions, identified that a commander may be positively required to deploy an AWS, as opposed to a non-

[1256] CCW, *ibid*, n.84, Principle 1.
[1257] *Galic Case, ibid,* 537, para. 58.

autonomous weapon, where the AWs offered a means or method that would lead to a reduction in civilian harms. Consequently, the Chapter Three analysis concluded in much the same way as Chapter Two, by identifying that there is no overwhelming evidence to suggest that AWS are inherently unlawful weapons. But, more than enough to show that the regulation of AWS should be given the highest priority.

Chapter Four conducted a comprehensive examination of the lawfulness of use of AWS in armed conflict in respect of a third, and 'relatively new branch of international law', and one that is fundamentally different to the previous two disciplines examined - International Human Rights Law (IHRL). This investigation noted, somewhat importantly, that while many of provisions of IHRL appear to remain at odds with IHL, the applicability of IHRL in armed conflict is well established. However, it also noted that where major differences between the two legal regimes arise, they generally managed by the legal concept of *lex specialis derogat legi generali*.[1258]

The first investigation regarding AWS, considered what Chapter Four referred to as the greatest conflict – the combatants privilege as compared to the Article 6 (1) ICCPR 'Right' that '[e]very human being has the inherent right to life…[and that]…no one shall be arbitrarily deprived of his life'.[1259] Chapter 4 identified that commentators such as UN Special Rapporteur on extrajudicial, summary or arbitrary executions, professor Christof Heyns, believes that it is 'inherently arbitrary for a machine to take decisions about life and death over human beings.'[1260] And, that as a result, AWS deployments should be prohibited. Nevertheless, this argument was shown to be unsustainable, primarily due to the rule identifying that the use of lethal force consistent with international humanitarian law and other applicable international law norms is, in general, not arbitrary.'[1261]

Part 3, somewhat unusually for the wider thesis examination, placed a significant emphasis upon assessing the lawfulness of one type of AWS - hunter-killer drones. And, indeed, this analysis acknowledged that many opponents of such AWS are correct in calling for them to be prohibited. This is particularly warranted where hunter-killer drones are deployed and operate outside of an operational and clearly defined

[1258] Special law repeals general law, see, *ibid*, n.738.
[1259] Art. 6(1) ICCPR, *ibid,* n.602.
[1260] *Ibid.*
[1261] GC36, *ibid*, n.828, para. 64 and 67.

battlefield and used to target enemy personnel of other individuals – not least because IHL does not apply and does not 'overrode' the Article 6 ICCPR right to life. Nevertheless, although a number of resulting GPs were added, even hunter killer drones could not be demonstrated as unlawful in all circumstances, especially when returning to the *jus in bello*.

The final part of Chapter Four considered three final IHRL provisions which are relevant to AWS deployments in order to identify whether they introduce an additional legal mechanism for either regulating, or, otherwise for supporting the argument against AWS - Article 7, Article 9, and Article 14 ICCPR. However, none of these provisions were able to refute the fact that IHRL does not prevent a nation from deploying Aws in an otherwise lawful armed conflict. Significantly, in much the same way as the previous two chapters analysis, the comprehensive IHRL examination supported the current authors argument that calls for an absolute prohibition on legal grounds is unjustified, but also, with regard to hunter-killer drones specifically, that AWS regulation is urgently required.

Having already considered the three bodies of international law which holistically determine the lawfulness of the use of Autonomous Weapons Systems (AWS) in armed conflict, Chapter Five sought to ascertain whether or not the use of AWS should be considered either *ethically* repulsive or *morally* required.[1262] This examination noted that, even though the purpose of this thesis is a comprehensive legal analysis of Aws, an ethical analysis is necessary due to the fact that a number of the following concepts are very likely to play an increasingly central role in the discussions relating to the creation (or not) of a new prohibitive treaty. The Chapter Five analysis was therefore conducted along three primary avenues. The first considered AWS in light of the six principles of *just war theory* (JWT). The second examined AWS alongside the ethical clauses and concepts which have been inserted into the treaties, namely, (i) The Martens Clause,[1263] and, (ii) The concept of Human Dignity. The third and final avenue of investigation examined two further concepts, (i) *Meaningful Human Control*

[1262] Yoo, *ibid,* n.679, 469, and, Sparrow, *ibid,* 579, 93.
[1263] The analysis in Chapter Five identified that some argue the Martens Clause is an independent treaty obligation. However, as noted by Dinstein, *ibid,* n.244, para.38 the principles of humanity and the dictates of public conscious should not be considered as additional strata of the law.

(MHC), and (ii) the matter of whether AWS should be prohibited simply because they are *mala in se.* [1264]

Part 1, therefore examined what is perhaps the single most technologically advanced method of waging war, in light of a theory which has been utilised for centuries to determine whether a particular resort to force should be considered *just*. The six principles helped to peer beyond the associated legal obligations of deploying Aws in armed conflict, to wider questions relating more generally to the ethics of war, and possibly further into the moral codes that might be inherent within the individuals that are affected by it. Nevertheless, having the analysis provided no evidence to suggest that JWT intrudes into, or in any way disrupts, the thesis hypothesis. Indeed, as opposed to supporting the claims of those in opposition to AWS, JWT actually substantiates the general viewpoint offered herein.

The Martens Clause was shown to have a legal connotations, and, in linted instances it was demonstrated as being of relevance. Though the clause is steeped in moral and ethical parlance, however, its text is especially ambiguous. However, even where the 'widest' interpretation was considered, there was no evidence to suggest that there is anything like *overwhelming* support for an absolute prohibition on the development and use of AWS. Part 2 also considered the concept of human dignity – which this chapter identified is a concept that is referred to throughout a great deal of international treaties. And is also a concept that man believe should prevent the use of AWS.

Nevertheless, the investigation identified the reasons that the dignity argument must fail, not least due to the fact arguments grounded in dignity are consistently vague, largely unsubstantiated and often seen as empty rhetoric. The final Chapter Five analysis returned to Professor Sparrow, but this time to his suggestion that AWS are quite simply evil in themselves, and as result they should be prohibited. However, the argument that humanity simply knows that it would be unethical or immoral to allow machines to make lethal decisions is weak. Indeed, when applied outside of conflict it has connotation for medical systems and even in everyday on the highway, where autonomous cars will at some point have to be delegated some types of decision-

[1264] Sparrow, *ibid*, n.579, 110.

making responsibilities regarding the loss of life. As a result, the *mala in se* argument was shown to be fundamentally impaired.

Chapter Five did not dispute that the field of ethics may yet have an important role to play in the discussion regarding AWS. Indeed, it may even be responsible for providing the grounds for implementing a prohibitive treaty. However, for it to do so, critics of AWS need to identify a much more solid 'ethical' ground than those considered. In other words, as summarised in Chapter Five, if the potential for a more accurate, less destructive means of warfare is to be denied to those whose lives might be saved as a result of their introduction, then it must be done on more than just a hunch.

The final investigative chapter consider the legal accountability of AWS, a topic which many observers believe raise the 'most serious concern' regarding AWS .[1265] The chapter examined the claim that due to their inherently autonomous nature, there will be instances where the humans associated with the use and/ or production of AWS will escape criminal liability for the suffering that the weapons will inevitably cause.[1266] The analysis in this chapter identified that no one individual will be able identify a single method for assigning accountability - it will be for nations to decide how it is best achieved. However, it also introduced the existing concept of *command responsibility* and demonstrated why a number of commentators, including the present author, believe that it can be adapted to suit AWS.

The analysis demonstrated that when *command responsibility* is applied, and the *Template* and the GPs are utilised in order to regulate AWS - especially those that have the potential to operate outside of MHC – there is no accountability gap, and a responsible human could be identified should a crime be committed by an AWS. However, at the heart of this discussion, Chapter Six identified the *accountability illusion*, and the reality that , '[w]hether a weapon is per se unlawful is not, and has never been, based on whether an individual can be held accountable for violations following from its use'.[1267]

As noted, command responsibility does, as noted, overcome the accountability gap, regardless of whether or not it is required. However, in addition, Chapter Six also

[1265] Jenkins, *ibid*, 286, 120, Margulies, *ibid,* n.1096, 405.
[1266] See e.g., HRW (2015), *ibid,* n.191, 1.
[1267] *Ibid.*

considered a number of alternative legal remedies. These included the potential for civil accountability of AWS, whether that be user accountability, and/or the accountability of AWS developers and manufacturers. Moreover, this section briefly considered so called war torts, a concept that does not yet exist but which the analysis identified could be of enormous benefit. However, in conclusion Chapter Six noted that even where these additional methods of assigning accountability could be applied, they must only be used as a secondary remedy, and not as a replacement for command responsibility.

Finally, Chapter Seven was used to present the culmination of the preceding six-chapter analyses in the form of a Legal framework. This was referred to as the Guiding Principles for Regulating the Use of Autonomous Weapons Systems in Armed Conflict – which are the primary aim and purpose of this thesis. Chapter Seven is intended to be presented as a standalone document, and it is one which offers a clear, concise, and future-proof method for ensuring AWS are deployed lawfully, but with due regard for MHC at its core. However, this should also be seen as a pre-conclusion – a summary of the rules which have been lifted from each of legal investigations in the previous chapters. The 51 'rules' were presented in a number of ways, in order to ensure they can be readily applied by those responsible for developing and deploying AWS.

The research has identified a number of areas that are still in need of greater judicial enquiry. As noted above, questions remain, for example, as to the extent of the ethical obligation to assign accountability – and as to whether states wish to account for this by way of additional RULES. Indeed, states may well choose to include any number of additional RULES that are extraneous to the legal analysis conducted herein. These may also include, for example, an obligation for non-proliferation of AWS (bearing in mind the present author has not considered RULES such as these due to the fact that the discussion would have been purely speculative). In addition, as a wider variety of non-lethal weapons are introduced onto the battlefield, some of which have not yet even been imagined, their deployments will need to be monitored to ensure compatibility with international law, and the guiding principles.

Nevertheless, the implications of this framework cannot be overstated. The *Template* has made it possible able to consider, and indeed classify AWS according three fundamental axis. It is only by doing so that the thesis was able to complete its third

and final primary objective of establishing a user-friendly, future-proof, legal framework for regulating the use of AWS.

Going forward, for each potential AWS deployment, a commander - armed with the thesis' General Principles - will be able to answer a series of questions. These are, (i) what is the maximum level of autonomy that the AWS will be operating at? (ii) is the AWS to be deployed to act reactively or proactively (offensively or defensively)? (iii) is the AWS to be used to apply lethal force or non-lethal force? and (iv) will the AWS be deployed upon a clearly defined battlefield? The answers to these questions will determine which rules will be presented to the commander/ AWS operator. Indeed, one might even imagine a relatively simple AI operating system 'doing the legwork', and possibly even preventing deployment in circumstances where it would be unlawful to do so.[1268]

In other words, the with resulting legal framework, states will help to ensure that the development and introduction of increasingly advanced AWS is regulated, and importantly, open, and transparent. Moreover, by supporting the framework discussion with the *Template*, all the parties involved in the AWS negotiations - whether they are states, international organizations, military generals, lawyers, academics, or technical experts - can be sure they are discussing the same thing. There can be no doubt, therefore, that this thesis has made a significant contribution to the research in this field.

[1268] See generally, Grimal and Pollard, *ibid*, n.4. Here the authors ground their discussion in the concept of robot refusal. Noting that because such an operating system would not authorise force, but merely prevent it from being applied were the order was erroneous and/ or unlawful, it would not be an AWS.

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