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THE COMPLIANCE OF LETHAL AUTONOMOUS WEAPONS SYSTEM WITH INTERNATIONAL HUMANITARIAN LAW

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Abstract

Contemporary technology developments have impacted areas of armed conflict and spawned new weapon types as lethal autonomous weapon systems (LAWS), cyber weapons, and armed drones. As new weaponry entered the battlefield, robots were able to function independently, eliminating the need for human decision-making. The traditional interpretation of International Humanitarian Law (IHL), especially the application of LAWS in the conflict, is also called into question by these developments. The new weapons can choose their target and decide whether to attack without human assistance thanks to artificial intelligence (AI). The issue arises in accordance with the legal requirements relevant to armed combat since humans have not intervened. Prior to maximising the use and deployment of the weapons, the current limitations and the preventative measures outlined in the treaty processes must be adhered to. Furthermore, the interpretation and application of IHL are now in doubt due to the deployment of ever-more-advanced weaponry. Modern technology's humanitarian benefits in violent wars are not always obvious. Therefore, it is essential to ascertain how the traditional IHL standards apply to newly created weaponry and technologies manufactured by both state and non-state actors. Determining the precise nature of weapons and their humanitarian effects is also crucial. These weapons are often operated by algorithms rather than humans. Researching the characteristics, effects, and suitability of weapons for use in armed conflicts and within the bounds of international humanitarian law is essential. Given this, the current study looks at IHL laws and the humanitarian effects of LAWS, focussing on the organization's difficulties adhering to the IHL process and how this affects decision-making.

Keywords: Lethal Autonomous Weapons Systems (LAWS), International Humanitarian Law (IHL), Meaningful Human Control, Algorithmic Bias, Artificial Intelligence, etc.

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Introduction

Modern armed conflicts mostly rely on weaponry that are based on technology. When used on the battlefield, weapons like LAWS are beneficial. As discussed in the preceding chapter, LAWS incorporates a number of extremely intricate and technical aspects. Examining the constitutionality of LAWS under the current IHL framework becomes crucial given their unusual character. The ability of LAWS to make judgements without human input after activation has sparked heated arguments and discussions throughout the world. Supporters of LAWS are calling for greater accuracy, precision, and adherence to the law with the least amount of harm possible, which might save lives. The other party is requesting proactive restrictions, claiming such LAWS pose threats to the principles of IHL, the right to life, and dignity.

The development of science and technology, which gives the employing forces a military edge, is directly or indirectly linked to the growth of warfare. The degree and kind of damage done against enemies are influenced by the military advantage provided by sophisticated weapon systems like LAWS. To guarantee that the IHL principles are respected in such a situation, it is imperative to review the existing regulatory norms. The purpose of this research paper is to evaluate the regulation of the development and use of LAWS in international warfare within the framework of International Humanitarian Law (IHL) and to determine a suitable legal response to the legitimacy of LAWS as a weapon system.

The state's choice to create, obtain, or implement LAWS must be consistent with its commitments under international law. The legality of LAWS within the existing IHL framework outlines the pressing need to understand the historical development of these legal principles. Furthermore, the accumulation of LAWS and related weapons tends to lead the nations to a arms race, thus raising instability in the global stage and setting the stage for high end conflict.

Evolution of IHL

The rules of war, or IHL, as they are currently known, have changed over time. Customs dating back hundreds or thousands of years, such as the prohibition against poison and poisoned weapons, reflect the laws of battle.² The Laws of Manu are among the antiquated legal systems

² Yoram Dinstein, *The Conduct of Hostilities under the Law of International Armed Conflict* (4th edn, Cambridge University Press 2022) 68.

that forbid the use of weapons that are barbed, poisoned, or fire-blazing, as well as the wilful assault of non-combatant individuals and the killing of a warrior who is surrendering or seriously injured.³ After seeing the atrocities of Solferino, Henry Dunant authored a book in 1864 called “A Memory of Solferino”.⁴ This book sparked discussions on the norms of war.⁵

The following interconnected variables have been identified as the driving force behind the codification of the rules of war:⁶

- The adoption of mandatory military service in several states significantly expanded the size of their armies;
- Advancements in arms technology have made warfare more destructive, increasing the potential for damage and casualties;
- Significant increase in the number of victims in armed conflicts;
- To limit the destructive impact of war.

The primary objective of the endeavours was to lessen the negative impacts that conflict has on people. Therefore, more progress towards the definition of international instruments governing military operations began to take place in order to accomplish these goals.

Saint Petersburg Declaration, 1868

The development of the rules of war began when representatives from seventeen Russian states met in St. Petersburg in November 1868 to discuss the ban on a certain type of exploding projectile.⁷ The serious wounds inflicted by the projectile, which led to shards spreading throughout the body and complicated medical care, significantly aggravated the victim's misery. An important step forward in the management of armed conflict was the countries' agreement to outlaw the use of anti-personnel munitions. It was the first explicit agreement between countries to ban a particular weapon.⁸ It was prohibited to use any

³ Robin Coupland, 'Humanity: What is it and how does it influence international law?' (2001) 83 “International Review of the Red Cross” 969.

⁴ Henry Dunant, “A Memory of Solferino” (Ravenio Books 2013).

⁵ Judith Gardam, “Non-combatant Immunity as a Norm of International Humanitarian Law” (Martinus Nijhoff Publishers 1993).

⁶ Dietrich Schindler and Jiří Toman (eds), *The Laws of Armed Conflicts* (AW Sijthoff 1973).

⁷ Hans-Peter Gasser, “A look at the Declaration of St Petersburg of 1868” (1993) 33 *International Review of the Red Cross* 511.

⁸ Thomas McFarland, “The Status of Autonomous Weapon Systems Under International Humanitarian Law” (Thesis, University of Melbourne 2017).

explosive projectile weighing less than 400 grammes that included flammable or explosive components.⁹

The St. Petersburg Declaration's preamble set forth the essential principles of modern rules of war. It emphasised two key ideas. The first was military necessity, according to which military actions should only be taken when they are required to weaken the opponent. The second is to prevent unnecessary suffering by avoiding the use of weapons that do more damage than is necessary.

Brussels Declaration, 1874

In July 1874, a meeting was held in Brussels with the participation of fifteen European nations. Limitations on the tools of war and the fact that belligerents do not have unrestricted authority when using weapons to damage the adversary were both specified in the Brussels Declaration.¹⁰ Since then, this idea has been a fundamental component of weapons legislation and has largely stayed the same in all significant documents.¹¹ The Declaration of Brussels prohibited the use of poison or poison-tainted weapons,¹² prohibited the use of weapons, projectiles, or substances that cause unnecessary suffering, and reaffirmed the ban on explosives that was agreed upon in St Petersburg.¹³

The declaration had an impact on the future evolution of weapons law even though it was not ratified and recognised as a legally binding agreement. Its concepts influenced the renowned Hague Peace Conferences of 1899 and 1907 and were included in the Oxford Manual of 1880.

Hague Peace Conference, 1899

The First Hague Peace Conference in 1899 addressed concerns over growing military buildups and weapon technological breakthroughs. Three conventions pertaining to the law of war and three declarations that forbade the use of particular weapons, balloon-launched

⁹ Jean-Marie Henckaerts and Louise Doswald-Beck, "Customary International Humanitarian Law" (2 vols, Cambridge University Press 2005) vol II, pt 1.

¹⁰ "Declaration concerning the Laws and Customs of War" (Brussels, 27 August 1874) art 12

¹¹ McFarland, T. (2017), *The Status of Autonomous Weapon Systems Under International Humanitarian Law*. Thesis: University of Melbourne.

¹² Brussels Declaration (1874) art 13(a).

¹³ *Ibid*

projectiles,¹⁴ projectiles designed to deliver poisonous or asphyxiating gases,¹⁵ and expanding dum-dum bullets¹⁶ were the outcomes of the conference. In the meantime, during the 1905 battle of Tsushima, the Japanese fleet was defeated by Russia and was left in a terrible shipwreck.¹⁷ It shocked the conscience of humanity and much later inspired the adoption of the second Geneva Convention (GC) for the protection of wounded, sick, and shipwrecked at sea.

To improve the humanitarian standards of war operations, a second conference was held in 1907. This led to the signing of thirteen conventions and one proclamation, which together made up the most comprehensive collection of wartime laws at the time.¹⁸ They were acknowledged as declaratory of customary law later in the 20th century.¹⁹ Weapons law was advanced by the Hague Convention of 1907, which addressed the laws and traditions of war on land. In addition to offering a list of particular weapons that were banned or outlawed, it also strengthened and broadened the basic guidelines for new weapons.

World Wars I and II witnessed many soldiers behind enemy lines and many were captured and millions suffered ill-treatment at the hands of their captors.²⁰ This led to the adoption of the third General Covenant on Prisoners of War, which was designed to address the problems that Prisoners of War (POWs) experienced during wartime, and the fourth General Covenant on the Protection of Civilians During Wartime. At the initiatives of ICRC, on August 12, 1949, four Geneva Convention (GCs) were adopted at the ICRC's proposal for the protection of civilians during wartime, ill and injured in the field, sick, wounded and shipwrecked at sea, and prisoners of war. The two primary areas of the evolution of the laws of war until the 1970s were Hague law, which addressed the constraints of means and techniques to wage the war, and Geneva law, which concentrated on safeguarding individuals impacted by battle.

¹⁴ “Declaration Prohibiting the Launching of Projectiles and Explosives from Balloons” (The Hague, 29 July 1899) 220.

¹⁵ “Declaration Prohibiting the Use of Projectiles the Object of Which is the Diffusion of Asphyxiating or Deleterious Gases” (The Hague, 29 July 1899) 225.

¹⁶ “Declaration Prohibiting the Use of Projectiles Containing Explosives or Other Substances Which on Explosion Produce Effects Notably Harmful to Man or Animals” (The Hague, 29 July 1899) 227.

¹⁷ Hans Kohn, “Out of My Past: The Memoirs of Count Kokovtsov” (1936).

¹⁸ Prokopios Pazartzis and Panos Merkouris, “Permutations of Responsibility in International Law” (Brill Nijhoff 2019).

¹⁹ Judgment and Sentence of the International Military Tribunal* (Nuremberg, 1 October 1946) 253.

²⁰ Hugh Jones, “Violence against Prisoners of War in the First World War: Britain, France and Germany, 1914-1920” (No. 34, Cambridge University Press 2011).

The widespread use of indiscriminate conventional weapons and the horrific planned civilian bombings during the 1955–1975 Vietnam War rocked the world community's conscience once more.²¹ In order to address the emerging concerns in armed conflict, the International Committee of the Red Cross (ICRC) was inspired to create the two Additional Protocols to the GCs in 1977. To review the text of further protocols created to reinforce and enhance the GCs, the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts was convened in 1974.²² Consequently, Geneva law and Hague law, which had been evolving independently until 1977, were brought together by the adoption of the two Additional Protocols to the GCs.

In 1974 and 1976, the ICRC organised Conferences of Governmental Experts on the Use of Conventional Weapons.²³ As a result of these efforts, Convention on Certain Conventional Weapons (CCW), 1980—a landmark piece of weapons regulation—was adopted, imposing limitations and prohibitions on a variety of conventional weapon types. The CCW's goal was to control the use of particular kinds of weapons when wars were being fought.

The first permanent treaty-based court with jurisdiction over the most serious crimes of concern to the international community, including war crimes including violations of weapons law, was the International Criminal Court (ICC), which was founded in 1998.²⁴

For example, the Biological Weapons Convention of 1972 covered biological weapons, while the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction of 1993 regulated chemical weapons. Analysing LAWS's legal conformity with the core IHL principles is essential since they represent innovative technologies that complicate the implementation of IHL.

²¹ George Bogaski, “American Protestants and the Debate Over the Vietnam War: Evil Was Loose in the World” (Lexington Books 2014).

²² Federal Research Division, “The Future of International Humanitarian Law” (2020).

²³ Frits Kalshoven, 'The Conference of Government Experts on the Use of Certain Conventional Weapons, Lucerne, 24 September–18 October 1974' (1975) 6 *Netherlands Yearbook of International Law* 77; Frits Kalshoven, 'The Conference of Government Experts on the Use of Certain Conventional Weapons, Second Session, Lugano, 28 January–26 February 1976' (1976) 7 *Netherlands Yearbook of International Law* 197.

²⁴ Rome Statute of the International Criminal Court* (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 3.

Legality of Autonomous Weapon Systems

The evolution of IHL has continuously sought to lessen the harm brought about by conflict, mirroring traditional standards with contemporary laws. This need also applies to modern technologies, like LAWS, which need to be examined to make sure they meet accepted humanitarian norms. States must always adhere to IHL's principles while developing weapons or war strategies, even if doing so results in temporary disadvantages.²⁵ Even during emergencies, good governance incorporates the norms of international humanitarian law.²⁶ States are required to make sure that their tactics and resources are in accordance with the international legal system when engaging in armed combat. This is necessary to ensure that fighters only target lawful targets and to restore and sustain peace.

Human soldiers with the capacity to make morally and legally sound judgements were the initial target of IHL concepts such as distinction, prudence, proportionality, humanity, and military necessity. The question of whether robots can follow these IHL principles—which were designed for human combatants—has arisen with the introduction of LAWS. Because of the complexity of IHL and the limits of modern technology, it is challenging to translate these concepts into the binary code for LAWS.

Human rights organisations,²⁷ academics,²⁸ and United Nations (UN) special rapporteurs have all questioned the legality of LAWS, arguing that it lacks the human intelligence and situational awareness necessary to grasp the larger picture—qualities that are crucial in combat situations. LAWS will never be completely consistent with IHL without this deeper knowledge.²⁹ As a result, a complete and proactive prohibition on the creation and implementation of such systems has been demanded by all relevant nations.³⁰

The Campaign to Stop Killer Robots was started by Human Rights Watch (HRW) and a number of other Non – Governmental Organisations (NGOs) to promote a comprehensive

²⁵ Dieter Fleck, 'International humanitarian law after September 11: challenges and the need to respond' (2003) 6 *Yearbook of International Humanitarian Law* 41.

²⁶ *Ibid*

²⁷ Bonnie Docherty, "Losing Humanity: The Case Against Killer Robots" (Human Rights Watch 2012).

²⁸ Christof Heyns and Sarah Knuckey, "The Long-Term International Law Implications of Targeted Killing Practices" (2013)

²⁹ Nicholas William Mull, 'The Roboticization of Warfare with Lethal Autonomous Weapon Systems (LAWS): Mandate of Humanity or Threat to It' (2017) 40 "Houston Journal of International Law" 461.

³⁰ Mitko Hadji-Janev and Kire Hristovski, 'Beyond the Fog: Autonomous Weapon Systems in the Context of the International Law of Armed Conflicts' (2017) "Jurimetrics" 325.

and proactive ban on the creation, production, and use of full LAWS. Concerns over the growing autonomy of weapon systems have been detailed in a number of papers published by HRW. In support of this demand, the European Parliament passed Resolution 2014/2567, which forbids LAWS that use the targeting process in an automated manner. Additionally, roboticists have maintained that it is theoretically impossible to build robots that are superior to humans and that can adhere to IHL principles. Given their disregard for IHL principles, these organisations have suggested a total prohibition on the creation and use of LAWS.³¹

IHL is unquestionably applicable to people and not to robots.³² It has been underlined in international debates that laws should support human discretion when deciding whether to use force, not take its place. The use of LAWS to aid human decision-making in targeting is not specifically prohibited by current IHL treaties and norms. However, as IHL requirements are expressly attributed to people, they cannot be transferred to LAWS.

Furthermore, it can be claimed that unfettered reliance on LAWS is prohibited by IHL because upholding fundamental IHL principles requires context-specific assessments based on interpretations of particular situations rather than depending only on numerical data or technological indications.³³ These assessments include:

- The obligation to determine whether a combatant has been rendered hors of combat, which protects them from being the target of an attack, and if a person is actively engaging in hostilities, which results in their loss of protection from such an assault.³⁴
- People shall be presumed to be civilians if it is unclear if they are combatants or civilians;³⁵
- The responsibility to determine whether an assault is likely to cause unintentional injury to people or damage to civilian property that is out of proportion to the expected military goal;³⁶

³¹ Noel Sharkey, 'Grounds for Discrimination: Autonomous Robot Weapons' (2008) 11(2) "RUSI Defence Systems" 86.

³² Convention on Certain Conventional Weapons* (Geneva, 10 October 1980, entered into force 2 December 1983) (2019) para 17(b).

³³ Vincent Boulanin, Neil Davison, Nina Goussac, and Maaïke P Carlsson, "Limits on Autonomy in Weapon Systems: Identifying Practical Elements of Human Control" (SIPRI and ICRC 2020).

³⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (Geneva, 8 June 1977) art 41.

³⁵ *Ibid* art 50

³⁶ *Ibid* art 51

- It is imperative to stop an operation where it is clear that the target is not military, has special protection, or that the strike would violate the proportionality criterion;³⁷
- The obligation to determine whether an item, given its intrinsic qualities, location, intended use, or function, substantially aids military operations and whether, in the given circumstances, its total or partial destruction, capture, or neutralisation offers a definite military advantage.³⁸
- Prohibiting the destruction of an enemy's property unless it is absolutely necessary for combat activities.³⁹

Examining the creation and application of LAWS in light of the core tenets of IHL is essential given the importance of legal compliance.

Principle of Distinction

The differentiation principle, known as *jus cogens*, is a key standard that is essential for safeguarding civilians within the IHL framework. Parties must always distinguish between civilians and combatants during a conflict, according to Rule 1 of the ICRC's customary IHL study. The St. Petersburg Declaration, which stressed that the only way to weaken the opponent is by attacking its military, was the first document to codify this idea. The idea of differentiation was acknowledged as a basic norm during the Additional Protocol (AP-I and AP-II) discussions to the GCs 1949, and no state had any doubts about it. Articles 48, 51 (2), and 52 (2) of the AP-I provide that protected individuals and legitimate objects must always be distinguished during international armed conflicts.

According to the International Court of Justice (ICJ), one of the fundamental ideas found in the documents that make up International Humanitarian Law (IHL) is the distinction between combatants and non-combatants. The rule of distinction has also been acknowledged by domestic courts as a cornerstone of international humanitarian law (Prosecutor V. Kassem, 1969, para. 271). Additionally, the International Criminal Tribunal for the Former Yugoslavia (ICTY) ruled that the parties to the war must make a distinction between civilians and military objectives.

³⁷ *Ibid* art 57

³⁸ *Ibid* art 52

³⁹ Geneva Convention (IV) relative to the Protection of Civilian Persons in Time of War* (Geneva, 12 August 1949) art 53.

The goal of the concept of distinction is to safeguard those who are not engaged in combat activities, particularly hors de combat and civilians. An assault's weaponry must be adequately able to target the military target under the specific conditions of the attack (Boothby, 2016, p. 79). Since it prohibits striking civilians and civilian-related things, it is illegal to do so unless the civilians are actively taking part in the hostilities. International criminal law has also adopted the concept of difference, and violations of it can result in prosecutable war crimes, including crimes against humanity and serious violations of the 1949 GCs.⁴⁰

The notion of differentiation is applicable to all weapons and weapon systems, including LAWS. Therefore, in order to distinguish between protected individuals and justifiable military goals, state parties, developers, commanders, and fighters creating and implementing LAWS must adhere to the concept of differentiation. Military objectives, as defined by Article 52(2) of AP-I, are items that effectively support military action and whose neutralisation provides a clear and tangible military advantage under the conditions that prevail at the time of the attack. Therefore, there must be a clear and immediate military benefit to LAWS's choice to target and murder. Consequently, LAWS's pre-programmed binary code must be able to comprehend civilians and other protected groups of people in order to attack lawful targets and successfully carry out military goals during an armed conflict.

Combining distinct signals with symbols gives LAWS a dependable way to recognise and honour protected entities, improving their capacity to discriminate between targets. Parties to the conflict are forbidden from using emblems, signs, or signals improperly by affixing them to military targets.⁴¹ Any misuse of this kind by the parties involved in the fight will be considered perfidious and constitute a serious breach of AP I, which is equivalent to a war crime.⁴²

Combatants are compelled to wear their weapons in plain sight, a practice that has historically been used to identify involvement in hostilities.⁴³ Combatants are entitled to protection under IHL when they lay down their weapons because they are deemed hors de

⁴⁰ Rome Statute of the International Criminal Court* (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 3, art 8(2)(b).

⁴¹ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* (Geneva, 8 June 1977) art 38.

⁴² *Ibid* art 8

⁴³ Geneva Convention (III) relative to the Treatment of Prisoners of War* (Geneva, 12 August 1949) art 13(2)(c).

battle. Their metallic imprint and the unique actions and behaviours that come from military training are better ways to confirm this status. Three essential criteria may be included in the LAWS algorithms to guarantee adherence to the distinction principle during combat:

- a) Insignia and Uniforms: Acknowledging distinctive attire and emblems;
- b) Specific Arms Recognition: Recognising the precise weapons that the enemies are using;
- c) Metallic Footprint and Behaviour: It is possible to identify the unique noises, motions, and behaviours that come from military training.

Furthermore, in order to provide a second layer of safety and legal compliance, LAWS can be configured to hold fire on all civilians until they are shot upon, as they may not always possess a self-preservation instinct. In order to assist guarantee that these people receive the required protection, LAWS already has sensors that can identify indications of surrender or anguish brought on by wounds.

By classifying everyone who does not fit the requirements to be a combatant as a civilian, LAWS can respect civilian status. It is possible to program these programs so they don't target people just out of suspicion. This type of programming is in line with the protection of civilians⁴⁴ and would technically forbid targeting anybody who does not meet the previously mentioned requirements for active combatants. However, in order to further their security, LAWS can be further designed to detect machine-perceptible emblems that indicate their acknowledged and safeguarded status, such the Red Cross or Red Crescent insignia.

Since the majority of the battlefields in conventional warfare were selected to be outside of populated areas, it was easy to distinguish between soldiers and civilians. However, the majority of modern armed conflicts occur in densely populated urban areas, where civilians may actively participate in hostilities or unintentionally or knowingly serve as human shields for combatants, making it more difficult to apply the principles of distinction.

Additionally, there are four main reasons why LAWS may not always be able to adhere to the rule of distinction: the absence of clear definitions in IHL, the technological limitations

⁴⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* (Geneva, 8 June 1977) art 50(1).

of LAWS,⁴⁵ the fact that modern armed conflict necessitates human judgement and technical errors or potential malfunctions of LAWS.

Prohibition against Indiscriminate Attacks

The use of weapons that inflict excessive pain or suffering, assaults that fail to differentiate between military objectives and civilians, and weapons that produce widespread, severe, and long-lasting environmental destruction are all prohibited by the current IHL treaties and customary IHL.⁴⁶ Attacks that do not differentiate between military targets and civilians or civilian property are forbidden by this concept because:

- a) the attack cannot be directed at a specific military target;
- b) the attack uses a combat method or means that cannot be directed at a specific military target; or
- c) the attack uses a combat method or means whose effects cannot be limited as required by IHL and result in an excessive loss of civilian life, civilian injury, or civilian property damage.⁴⁷

Under IHL, assaults utilising two categories of indiscriminate weapons are prohibited: those whose effects cannot be controlled and those that cannot be targeted at a specified military objective.⁴⁸ The legal review procedure is often when the legal examination to ascertain the weapon or weapon system's intrinsic indiscriminate character is carried out.⁴⁹

Owing to the ban on indiscriminate assaults, a weapon or combat technique that cannot be targeted at particular military targets and affects both military and civilian targets indiscriminately, such as LAWS, is inherently indiscriminate.

LAWS and the Challenge to Distinction

Limitations in machine perception may provide difficulties for LAWS, raising questions about algorithms' capacity to handle the intricate evaluations and decisions required by the principle of distinction. In order to make precise targeting judgements, LAWS must thus

⁴⁵ International Committee of the Red Cross, *International Humanitarian Law and the Challenges of Contemporary Armed Conflicts* (2014) 7.

⁴⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* (Geneva, 8 June 1977) art 35(2).

⁴⁷ *Ibid* art 51.4a

⁴⁸ *Ibid* art 51.4b

⁴⁹ *Ibid* art 36

rely on context knowledge and an awareness of human intentions. The systems will be set up to only activate when they are fired upon in order to handle the LAWS compliance difficulties using the concept of differentiation. As an alternative, LAWS might only be applied in circumstances when the adversary forces are easily identifiable.

Programming algorithms that allow LAWS to make judgements based only on pertinent contextual information while ignoring extraneous data is another difficulty when deploying LAWS on the current battlefield. Accurately understanding the situation may be challenging for LAWS in combat scenarios that are complicated and changing quickly. LAWS must be built to weed out extraneous information and focus on important elements because considering every case is impracticable and would take an endless amount of time.

Principle of Proportionality

Despite IHL's efforts to safeguard civilian populations, civilian casualties and damage during armed conflicts cannot be totally prevented. The proportionality concept is essential in this situation. fighters must distinguish between civilians and active fighters, and although some incidental injury to civilians may happen, it is only acceptable if it complies with the proportionality principle. Attacks against enemy troops that inflict disproportionate incidental damage on civilians or civilian property are prohibited by the concept.

The proportionality concept is included in both conventional IHL and AP-II. Attacks that result in or are predicted to result in a significant and disproportionate accidental loss of human life, harm to civilians, destruction of civilian property, or a combination of these that cannot be supported by any tangible and immediate projected military gain are prohibited.⁵⁰

The International Criminal Tribunal for the former Yugoslavia, or ICTY Trial Chamber, emphasised that the reasonable person test is used to determine who is responsible for a disproportionate attack. This entails determining whether a person with reasonable knowledge might have predicted an excessive number of civilian casualties given the information at hand. Using this criterion to assess military advantage permits operational discretion.

⁵⁰ Emily Crawford and Alison Pert, *International Humanitarian Law* (2nd edn, Cambridge University Press 2020).

Proportionality assessments involve qualitative rather than quantitative judgements. There is no exact measure or calculation for the proportionality principle. Its use necessitates a contextual balancing of conflicting interests, where the expected military advantage of the strike is evaluated against the possible harm to people and civilian property. This evaluation entails weighing the advantages of military action against the hazards to non-combatants. A thorough assessment of the circumstances is required in order to carry out this kind of interest balancing, which must be done on an individual basis.

The concept of distinction and the idea of proportionality are connected. Since it disregards the need to reduce the negative effects on non-combatants and non-military objects, an attack that causes a great deal of harm to civilians may be considered indiscriminate. The proportionality principle concentrates on how such items may be assaulted, whereas the principle of distinction deals with objects that are subject to attack. It forbids the fighters from selecting weapons or tactics of war that, in relation to the expected military advantage, will inflict disproportionate damage.

In contrast to conventional weapons, LAWS rely on human judgement, which raises questions regarding their ability to follow the proportionality principle. LAWS must proactively consider the ramifications of every possible choice, assess the possible harm to civilians, and adjust to evolving circumstances in order to meet this duty. The expected military gain and the allowable level of collateral harm must also be evaluated by LAWS.

According to some academics, the absence of human judgement in LAWS makes it more difficult for them to adhere to the proportionality principle's criteria. Both the expected military advantage and possible collateral damage in armed combat are subject to quick changes based on the specific situation. Therefore, in order to perform fast and precise proportionality judgements, LAWS must have sophisticated processing and sensing capabilities. Therefore, by focussing the strikes to reduce collateral damage, LAWS that are developed with the right algorithms can follow the proportionality principle.

Principle of Precaution

The Hague Convention (IX) on Bombardment by Naval Forces in Time of War, which was signed in 1907, was the first document to express the precautionary principle. Article 57 of AP-I, which requires parties to armed conflict to continuously take precautions to protect

people and civilian property during military operations, further strengthened this idea. The precautionary principle is a component of customary international humanitarian law and is strongly linked to the concept of distinction and proportionality. Like proportionality and differentiation, the precautionary principle also depends on human judgement to be used successfully.⁵¹ Nonetheless, the duty imposed on disputing parties is necessarily relative since there may be circumstances in which protecting civilians is not practical.

The concept of precaution requires the parties involved in a conflict to take reasonable measures to prevent or lessen collateral damage to people and civilian property when selecting weapons and tactics of war. Practical or actually achievable safeguards are those that take into account all current conditions, including military and humanitarian ones. The following requirements must be met by those in charge of organising or choosing an assault in order to comply with the concept of prudence in attacks:

- a) Confirm Targets to ensure that the targets are military targets and do not consist of individuals, civilian objects, or protected entities;
- b) Select fighting tactics and weaponry that minimise damage to civilian targets and minimise injury to people;
- c) If an assault is expected to cause disproportionate injury to people or damage to civilian property compared to the intended military gain, do not launch it.

The possible consequences of an assault must be carefully considered throughout the planning phase in compliance with Article 58 of AP-I. This entails constantly checking the target, choosing the right weaponry, and carefully analysing the attack's time and strategy. An attack must be cancelled or stopped if it is judged that it may cause disproportionate harm or if the target is no longer legitimate. The following circumstances are part of the precautionary principle under IHL:

- a) Throughout the attack, the person's status must remain consistent as either a lawful target or a protected person;⁵²
- b) The fighters must evaluate the weapons they have at their disposal and use the ones that will cause the least amount of collateral harm;⁵³

⁵¹ Peter Asaro, 'On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making' (2012) 94 *International Review of the Red Cross* 687.

⁵² Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* (Geneva, 8 June 1977) art 50(1).

⁵³ *Ibid* art 57

- c) Decisions on targeting must be founded on accurate and validated intelligence data;⁵⁴
- d) Evaluation of the target's natural surroundings;⁵⁵
- e) In the event that civilians are present in the area of the assault, alerting them to the approaching military activity in the context of an attack.

Combatants must also carefully consider the options of weaponry available to them in order to adhere to the idea. In order to minimise collateral damage, the sides to the fight must choose the weaponry or tactics that will work best. Advanced observation capabilities seen in the majority of unmanned systems, such as LAWS, increase the bar for the level of prudence expected of those who own and use them in combat operations.

Precautionary measures are required during the planning stage of an armed deployment and apply to all those involved in the preparations, including not just commanders but also LAWS programmers and manufacturers. The people in charge of creating and implementing LAWS are accountable for making sure that the precautionary principle is followed. Equating attack planning with programming a military combat robot, however, presents inherent difficulties since it may unintentionally place civilian technologists in combat positions, which might lead to the direct involvement of people in conflicts.

Furthermore, LAWS can have technological protections that non-autonomous weapons would not have, including integrated or preprogrammed safeguards. These protections aid in making sure that every practical step is done to reduce damage to people and property. Thus, the use of precaution might be predicated on the wealth of data, knowledge, and technology that attackers have at their disposal during the pre-attack phase.

The IHL concept of prudence must be strictly adhered to when integrating LAWS into military operations. Because of LAWS's sophisticated surveillance features and programmable security features, it is more important than ever for attackers, makers, and programmers to make sure that safety precautions are followed throughout attack preparation and execution. Although LAWS give special chances to improve accuracy and reduce civilian casualties, they

⁵⁴ *Ibid* art 57(2),

⁵⁵ International Committee of the Red Cross, *Customary International Humanitarian Law* (2 vols, Cambridge University Press 2005) vol I, r 55.

also pose difficult problems, especially when it comes to the participation of civilians in combat operations. As a result, thorough planning and preventative measures are necessary to guarantee that the implementation of LAWS complies with the moral and legal requirements of IHL.

Principle of Military Necessity

The military necessity concept requires that fighters use force only to accomplish justifiable and targeted military goals. LAWS must be designed to be able to recognise and assess military need on the battlefield, making sure that they only strike targets that offer a clear military advantage, in order to comply with the military necessity concept. Proportionality, distinction, and humanity are the cornerstones of international humanitarian law, and they are inextricably linked to this need.

These ideas become increasingly more important in the context of technology breakthroughs, especially in the creation and implementation of LAWS. Laws must be crafted to apply proportionality by balancing the use of force to prevent undue injury in relation to the expected military benefit, in addition to understanding military necessity. In order to ensure that only legal military targets are engaged, they must also reliably distinguish between combatants and civilians, upholding the concept of distinction. Furthermore, in order to comply with their duties under IHL, LAWS must act in a way that minimises suffering and harm, as required by the humanitarian imperative.

Therefore, in order to assure adherence to the concept of military necessity, LAWS's programming and operating parameters must be carefully designed before being integrated into military operations. LAWS's use of force must be proportionate, focused on justifiable military goals, and balanced with humanitarian concerns. Following these guidelines will be essential as LAWS develops in order to preserve the legality of military operations and protect both combatants and civilians under IHL.

Principle of Humanity

The IHL concept of humanity emphasises how important it is to treat both combatants and non-combatants with respect and compassion during armed conflict. The legal framework governing the conduct of hostilities and the protection of individuals during conflict has been shaped by the principle of humanity, which has been essential to the creation and codification

of most IHL instruments.

The Hague legislation governing the control of firearms has been greatly influenced by the humane concept. The principle of humanity has achieved the stature of *jus cogens*, a preemptive rule of international law, alongside other core IHL principles. As a vital safety net, the idea of humanity constantly reminds fighters that, despite the conflict, all people—regardless of their position—remain human beings worthy of dignity and respect. Even in the most severe situations of armed conflict, this concept guarantees that each person's intrinsic value is acknowledged and respected.

Interestingly, the ICTY and ICC have emphasised that violations of IHL, including as the use of cruel weapons, may be tried as war crimes. These courts uphold the importance of the human principle in ensuring that moral and legal norms be respected in times of conflict in order to preserve human dignity. Thus, the idea of humanity not only influences the creation of legal standards but also directs their actual application and enforcement in armed conflicts.

The creation or use of new technology is not prohibited by the human principle. Actually, by increasing accuracy and reducing injury, technology may improve adherence to IHL. The application of LAWS in combat, however, is opposed by certain specialists who claim that such systems would go against the humane concept. They contend that a human being, not a computer, who understands the seriousness of the situation is the only one who can make death meaningful. This viewpoint casts doubt on LAWS's ability to sufficiently protect the humanitarian principles at the heart of IHL. The ideal of humanity will be violated if laws make it difficult or impossible for people to surrender or get medical help when they are hurt or unwell.

One of the pillars of IHL is the principle of humanity, and the use of LAWS may support and promote adherence to this ideal. With the use of advanced technological sensors, LAWS can more precisely recognise and understand human emotions, such as suffering or surrender intents, helping to uphold the human ideal.

Martens Clause

A key component of IHL, the Martens Clause guarantees the application of humanitarian standards even in situations not specifically covered by the current body of IHL

legislation. The clause, which was first included in the preamble of the Hague Convention II 1899, states that the protection of civilians and combatants in situations not expressly covered by IHL must be determined by standards drawn from accepted international norms, human rights, and public conscience.

The Martens Clause is referred to as a "treaty in miniature" and offers crucial protection in the lack of clear legal requirements, acting as a safety net or backup mechanism when written laws fail. To fill in any possible legal voids, the Martens Clause was included to the four GCs of 1949. The GCs require governments to follow the rules of public conscience, the laws of humanity, and the principles of international law that are drawn from the customs of civilised nations in circumstances not covered by the treaties.

There are many issues with LAWS, many of which are said to be outside the scope of the laws as they are now. As a viable solution to these inadequacies, this has conscience and basic human ideals. Others, on the other hand, contend that the Martens Clause is an additional mechanism that is only used when the laws that are in place are insufficient to control the means and weapons of war. The principle's applicability hinges on how well existing treaties and customary rules govern rules.

The Martens Clause should be taken into account by governments when determining whether these systems are lawful, according to an HRW study on LAWS. According to the study, this concept states that a weapon may be considered illegal even if it does not breach current treaties or customary laws, as long as it violates public conscience or human values. According to this understanding, HRW considers the Martens Clause to be a separate source of international law that, in the absence of particular codified treaties, can be used to forbid LAWS. HRW claims that the idea of LAWS, as expressed in the Martens Clause, deeply shocks and unnerves the public conscience. In support of HRW's findings, several academics contend that the public may be strongly repulsed by robots that have the ability to make life-or-death decisions.

LAWS users must have thorough understanding of the features of the system, its operating environment, and the expected consequences of its use in order to guarantee that they fulfil their IHL obligations and to improve their capacity to differentiate IHL violations from accidents. As a result, LAWS users need to possess the following information and

understanding:

- a) The kinds of individuals or items that LAWS may target while conducting its activities;
- b) Elements that influence if and when a law enforcement officer will employ force against a target;
- c) Environmental factors that might affect how well LAWS performs;
- d) The manner in which the operator can contact the LAWS;
- e) Elements crucial to determining if a planned attack is lawful;
- f) The possibility of mistakes, malfunctions, and incorrect target identification.

Understanding the architecture and operation of LAWS on a technical level helps users determine if an attack is lawful. IHL does not, however, need complete confidence about the results of an assault because it would be unrealistic.⁵⁶ IHL does not demand absolute clarity about LAWS's capabilities, the operating environment, or the expected repercussions, as this criterion equally applies to LAWS. IHL, however, forbids unbridled reliance on LAWS as doing so would go against the public conscience and human values outlined in the Martens Clause.

Despite LAWS's ability to support IHL principles, careful legal consideration is necessary before integrating them into military actions. To ensure they comply with IHL, states must conduct thorough legal examinations of new weapons, including LAWS. As required by Article 36 of AP-I, this review procedure is crucial for tackling the particular difficulties presented by LAWS and guaranteeing that their creation and implementation adhere to moral and legal requirements. The next part will go into the significance of the review process in relation to LAWS and how it affects adherence to IHL standards.

Obligatory Legal Scrutiny

Amidst the continuous discussion on LAWS's adherence to IHL, it is critical to make sure that these systems follow accepted legal norms. Since the previous discussion looked at both the possible obstacles and opportunities for LAWS to conform to IHL principles, a comprehensive legal evaluation under Article 36 of AP-I is required to determine whether or not they are compatible with IHL standards.

⁵⁶ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* (Geneva, 8 June 1977) art 57.

The legal review procedure for LAWS, as required by Article 36 of AP-I to the GCs, is covered in this section. In order to ascertain how LAWS meet these predetermined standards, it analyses the process for reviewing new and developing weapons and combat techniques under Article 36, comparing existing and potential standards.

Article 36 requires that the principles of International Humanitarian Law (IHL) be followed from the beginning when developing, researching, and deploying new weapons, means, and techniques of combat. Article 36, which requires state parties to the AP-I to carry out a comprehensive legal examination, is a vital link between IHL principles and developing weapon systems. The evaluation is necessary to make sure that IHL is being followed.

It is indisputable that the IHL framework applies to newly developed technical weapon systems used in combat, especially in view of Article 36 of AP-I. However, given their technological characteristics, applying current regulations to modern combat technology raises questions regarding LAWS's legal compliance. A required legal review procedure that involves the cooperation of roboticists, engineers, commanders, and legal specialists is necessary to properly handle such complicated challenges. To guarantee LAWS's legitimacy and to build trust among commanders entrusted with the systems' deployment, the active involvement of all these players is essential.

The justifiable need for confidentiality in weapon development hinders the development of international control processes and standards for the legal examination of weapons. As a result, internal and domestic processes bear the majority of the duty for examining new weapons. The majority of states continue to hold the opinion that issues pertaining to new weapons should be handled internally, with stringent oversight of the review procedures. Yet, it is crucial for states to share their policies and processes with other nations, even in the face of national interests and the secrecy surrounding the legal evaluation of new weapons and armed conflict tactics. Maintaining legal norms and enabling the international community to make well-informed judgements depend heavily on this transparency.

State Compliance: Conducting Legal Reviews

The procedure for evaluating whether new weapons are legal is well-established. The state parties are required by Article 36 of AP-I to evaluate whether new weapons and military techniques are legitimate. The state may be held liable for any ensuing legal infractions if this

evaluation is not carried out. Both customary and treaty law uphold this duty to examine new weaponry and tactics of conflict.

A. Customary Law

According to Blake and Imburgia (2010), it is normal to perform a legal analysis of new weapons and tactics to make sure they are legal and compliant with international humanitarian law. This long-standing customary duty has been formalised and its applicability strengthened by treaty law, which codified it. According to customary IHL, this duty nevertheless applies to governments that have not signed pertinent treaties. Therefore, nations must assess all new weapons in compliance with the standards set by both customary law and treaty restrictions to verify that new means of warfare and their intended use conform with customary IHL.

Beyond the criteria of AP-I, the duty to undertake legal reviews is based on IHL customary standards, which are applicable to all states regardless of whether they are party to AP-I. This duty extends to all governments, regardless of whether they are parties to AP-I, and it covers not just weapons in the widest meaning. The International Court of Justice (ICJ) has confirmed that it is usual for states to assess the legality of any armed conflict means they intend to acquire or develop.

B. Treaty Law

With the ratification of the St. Petersburg Declaration in 1868, the treaty responsibility to assess new weapons of combat was established. The statement, which reflected a long-standing commitment to ensure that new weapons conform with humanitarian values, set fundamental principles for the regulation of weapons.

Article 36 of AP-I to the GCs embodies this commitment in its present form. By mandating that governments verify the legitimacy of any weapons they plan to employ in armed conflict and make sure they adhere to IHL before to their deployment, Article 36 takes a preventive stance.

Considering how quickly military technology is developing, this duty is especially important. States must set up systems and processes within their borders to assess the legitimacy of newly developed and emerging 94 weapons in light of these rapid advances. According to Article 36 of AP-I, states must have policies in place to make it clear if such weapons are authorised. All nations, whether or not they are party to AP-I, are bound by Article 36, which guarantees that the duty to assess the legality of new weapons is upheld (ICRC, 2006).

A legal review decision in a variety of scenarios is included in the state responsibility under Article 36 of AP-I, demonstrating contextualism in light of current issues and situations. This stance emphasises how important it is to consider contextual significance when determining whether a new weapon system is permissible before any state uses it. A contextual analysis shows that IHL is still flexible enough to accommodate new forms of armed conflict and the changing nature of warfare technology. In particular, attorneys and roboticists will work together to create detailed standards for each system on LAWS. This cooperative strategy guarantees both adherence to the law and a precise evaluation of the system's real performance. It is reaffirmed that new weapons must be evaluated while taking into account the conditions in which they will be added to the arsenal of the state. This method guarantees that the functioning and design of the weapon are carefully assessed within the framework of its intended operating environment.

Scope of Article 36

The scope of Article 36 is wide and includes the study, creation, alteration, acquisition, and use of weapons of mass destruction. Weapons designed for use in both international and non-international armed conflicts are covered under Article 36 of AP-I. Additionally, the ICRC has confirmed that all armed conflicts are subject to the rules of international humanitarian law, including the need for legal review.

Although Article 36 requires legal evaluations of new weapons of conflict, this does not mean that all of the weapons that a state presently has or intends to purchase must be evaluated under this clause. The main question is whether a particular object meets the requirements for evaluation under Article 36 as a weapon or instrument of warfare. In order to concentrate the assessment process on items that are covered by Article 36, this first determination is essential.

LAWS and Legal Review

A key component of the creation and application of LAWS is the legal review required by Article 36 of AP-I. Legal studies also help define acceptable levels of foreseeable risk, define deployment methods, define standards for the use of LAWS, and determine the required amount of human supervision. Addressing particular legal limits pertaining to the use and operation of the weapon during armed conflict requires the legal review procedure.

The technical complexity is a major obstacle to the legal review of LAWS. This is because of the large amount of data and the variety of operational systems, which make it impossible to test every scenario directly. It is also impossible to test more than a small fraction of the scenarios. Second, because black box systems' decision-making processes are hidden from their operators, testing them may be very challenging. However, digital twin technology can be used to solve the problem. Comprehensive legal reviews can benefit greatly from this technology, which not only offers insights into the performance of existing products but also predicts how these systems can function in the future.

During the 2016 CCW Meeting of Experts on LAWS, key governments acknowledged the value of the review process in guaranteeing the legal creation and implementation of LAWS. Experts underlined the vital significance of legal reviews for LAWS during the 2018 GGE summit. They agreed that the best way to handle any possible concerns related to LAWS is to strengthen Article 36 of AP-I.

In addition to realistic testing and assessment of the system's development and operation, LAWS requires thorough hardware and software verification and validation. These steps guarantee that LAWS may employ force in accordance with applicable treaties, IHL, and safety standards for weapon systems.

Legal Advisor for LAWS Review

Article 82, which requires the presence of legal experts to counsel military commanders on the application of IHL throughout the phases of the approval process for new weapons, is a supplement to Article 36 of AP-I. According to Lawand, Coupland, and Herby (2006),⁵⁷ this clause guarantees that legal knowledge is incorporated into decision-making, improving the review process's efficacy and compliance.

Customary international humanitarian law also recognises Article 82 of AP-I. "Each State must make legal advisers available, when necessary, to advise military commanders at the appropriate level on the application of IHL," states Rule 141 of the Customary IHL Study.

⁵⁷ Katja Lawand, Robin Coupland, and Peter Herby, 'A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977' (2006) 88 *International Review of the Red Cross* 931.

The participation of legal counsel is essential during the two main stages of LAWS development. First, legal advisors may help with determining acceptable risk levels and testing for IHL compliance during the LAWS algorithm's design and programming stages. Second, commanders rely on legal counsel to handle any legal issues resulting from LAWS's activities and to traverse the unpredictable battlefield after the system is engaged and human involvement is no longer feasible.

Article 36 of AP-I provides a legal safeguard that serves as an a priori mechanism for the legal evaluation of weapons systems. All states are bound by this responsibility, whether by customary IHL or their adherence to AP-I. States have a duty to respect these principles, making sure that LAWS are created and implemented in a way that complies with humanitarian and international law requirements.

Conclusion

Compliance with IHL principles, which were first designed for human fighters, is a concern raised by LAWS. Within the traditional IHL paradigm, the legitimacy of LAWS has been extensively contested in this regard. Two schools of thought emerged in this area. The first contends that LAWS does a better job of adhering to IHL. However, a number of NGOs and human rights organisations support a pre-emptive ban on LAWS, arguing that it lacks the contextual awareness and human intelligence needed in combat. However, using LAWS to fulfil IHL responsibilities is not prohibited under current treaties or customary IHL.

On the surface, using LAWS is not unlawful. Evaluating LAWS's effect on the IHL principles is crucial to determining their acceptability. Complete autonomy levels of LAWS and their impact on legal compliance are the first port of call when it comes to the regulation of LAWS under IHL. LAWS are able to carry out their mandate precisely. It may theoretically outperform human fighters in terms of efficiency and yield superior results.

The potential of LAWS in relation to the core tenets of IHL becomes crucial in this situation. Furthermore, the requirement to monitor legal compliance and avoid future breaches originating from the design and use of LAWS is highlighted by the legal review responsibility of state parties under Article 36 of AP-I. Because computers cannot be held accountable for legal infractions caused by LAWS. In light of this, it is important to investigate who is responsible for the legal infractions caused by the creation and application of LAWS. In these

situations, state accountability plays a crucial preventative role in ensuring that LAWS are developed and implemented in compliance with the law.

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