INTERNATIONAL LAW STUDIES

Published Since 1895

Command Accountability for AI Weapon Systems in the Law of Armed Conflict

James Kraska

97 INT'L L. STUD. 407 (2021)

Volume 97

2021

Published by the Stockton Center for International Law

ISSN 2375-2831

Command Accountability for AI Weapon Systems in the Law of Armed Conflict

James Kraska[*]

CONTENTS

* James Kraska is the Chair and Charles H. Stockton Professor of International Maritime Law in the Stockton Center for International Law at the U.S. Naval War College. He may be reached at james.kraska@usnwc.edu. The author thanks Michael N. Schmitt; Michael Meier; Lieutenant Colonel John Cherry, USMC; Merel A. C. Eckelhof; Professor Laura Dickinson; Shawn Steene; Colonel Christopher Korpela, USA; and Raul "Pete" Pedrozo for their thoughtful critiques and comments. The author also gratefully acknowledges valuable research assistance by Vishaka Ramesh and Vishesh Bhatia.

The thoughts and opinions expressed are those of the author and not necessarily those of the U.S. government, the U.S. Department of the Navy, or the U.S. Naval War College.

I. INTRODUCTION

Compressed tactical decision cycles will be the fulcrum of future, fast-paced hyper-war. AI weapon systems promise to extend and maximize human capabilities, becoming essential to the survivability and lethality of armed forces in this lethal operating environment. AI is not the weapon; it is the component or element of a weapon system—most likely a military network or "Military Internet of Things" that will accelerate the speed and decision making in the application of fires or effects.[1] The networked force will inform enterprise-wide situational awareness and battle management. Forces are unlikely to field "killer robots"—solitary entities carrying weapons and making life and death decisions free of human command. Instead, creation and employment of autonomous weapon systems (AWS) will require a well-defined operational environment and access to rich, accurate, extremely large data sets, such as GPS, fed by distributed sensors, plus improved machine learning algorithms and high-performance processors that will fuse AI into the kill chain.[2] The kill chain process combines multispectral sensors to understand the warfighting environment, positively identify, track, and select targets, and engage them with the most appropriate effects.[3] (The Soviet Union referred to this process as the "reconnaissance strike complex," while in the 1990s, John Boyd in the United States popularized the term, "OODA loop," in which armed forces race to observe, orient, decide and act before their adversary).[4] AI is designed to facilitate this adaptive, multi-domain, high velocity decision making model, and in doing so it is expected to provide a decisive military advantage. Part II of this study recounts the current and potential uses of AI in the U.S. armed forces during armed conflict.

---

1. CHRISTIAN BROSE, THE KILL CHAIN: DEFENDING AMERICA IN THE FUTURE OF HIGH-TECH WARFARE 141–60 (2020).

2. *Id.* at xviii.

3. RICHARD S. DEAKIN, BATTLESPACE TECHNOLOGIES: NETWORK-ENABLED INFORMATION DOMINANCE 473–75 (2010).

4. Christian Brose, *The New Revolution in Military Affairs*, FOREIGN AFFAIRS, May-June 2019, at 122, 122–23 (Russian "strike-reconnaissance complex"); Bradley Perrett, *China's Growing Ability to Drive Away U.S. Forces*, AVIATION WEEK & SPACE TECHNOLOGY, Oct. 28, 2018, at 56 (China's lethal kill chain); BARRY SCOTT ZELLEN, THE ART OF WAR IN AN ASYMMETRIC WORLD: STRATEGY FOR THE POST-COLD WAR ERA 81–82 (2012) (describes the "OODA loop").

In Part III, the study turns toward the rules applicable to the employment of AI in war. All methods and means of war, including AI, must conform to the law of war, also called the law of armed conflict (LOAC) or international humanitarian law (IHL). Commanders are accountable for ensuring that methods and means at their disposal and under their command, including AWS, comply with the principles of LOAC, such as distinction, proportionality and the rule requiring precautions in attack.

Part IV explores an effort by the Member States of the Convention on Certain Conventional Weapons (CCW) to develop standards that will help ensure compliance of AWS with LOAC. The CCW has convened a group of governmental experts (GGE) to consider definitions to standardize levels of human judgment or control over AWS in order to ensure that humans remain accountable for the acts of machines. The GGE is focused most significantly on ensuring that the employment of Lethal AWS (LAWS) during hostilities is consistent with LOAC. This work is designed to close a perceived "gap" in the law exposed by LAWS. Yet whatever standard emerges from this process is unlikely to be an effective and reliable guide for ensuring that AWS operating in compliance with LOAC.

Furthermore, some nongovernmental groups (NGOs) and concerned States believe it would be unfair to hold a commander accountable for an autonomous weapon system that acts unpredictably, but that is the way that the military operates—imbuing military command with plenary authority and accountability over the force.[5] The CCW GGE effort is unlikely to produce detailed, widely accepted rules that meaningfully improve upon this paradigm. Operational military commanders already are accountable for their employment of AI weapon systems during armed conflict – the focus of Part V.

Part V explores human accountability, embodied in the military commander. The military commander is accountable for the employment of AI weapon systems and all lines of effort supporting the prosecution of the war effort under his or her direction. Direct, individual command accountability is longstanding and complete. The commensurate burden of accountability for all military operations—including AI-enabled attacks in armed conflict—resides at the top of the chain of command. This accountability may be in the form of criminal law, but it also includes an array of administrative and

5. The NGOs are focused, it appears, solely on criminal accountability, which is a narrow subset of overall military accountability. It might be unfair to hold a commander criminally responsible for an autonomous system's mistakes, but it would not be unfair to hold the commander accountable in a broader sense.

non-judicial measures. Direct accountability covers every occurrence that unfolds during armed conflict, including those in which international criminal courts lack jurisdiction or have insufficient evidence, so it regulates commander's behavior even when they lack criminal intent, and indeed, even if they are not directly "at fault."

Part VI concludes that the direct and individual accountability of the commander has the benefit of being longstanding, widely understood, and intuitively appreciated by line officers and military leaders; it is part of military culture. While it may utilize legal processes, including the military justice system, it is not wholly encumbered by or dependent on them. While commanders are still subject to criminal penalties for war crimes, military accountability also includes an array of nonjudicial and administrative sanctions. The commander's accountability over AI weapon systems is especially compelling because unlike conventional weapons there are no additional persons (or fewer persons) on which to place the onus of blame if something goes wrong.

II. AI IN FUTURE U.S. MILITARY OPERATIONS

The term "AI" generally means the "ability of a computer system to solve problems and to perform tasks that would otherwise require human intelligence."[6] AI involves machines exercising executive functions to make independent, data-based decisions, but predefined behavioral boundaries may limit the range of behaviors. Prediction is one of the most vexing tasks of the operational commander. Achieving AI can be accomplished through several means, such as machine learning, deep learning, and edge computing. Machine learning is a subset of AI that uses algorithms that can self-modify and produces an AI model without direct human intervention. "To a large extent, Machine Learning systems program themselves."[7] Deep learning involves numerous layers of these algorithms, with each layer analyzing the data in an artificial "neural network" that compounds linear analysis and is designed to imitate the functions of the brain. Networks may leverage the power of "edge" computing that places computations and data storage in a network distributed forward, at sea or on the battlefield, closer to the location where it is needed.

6. GREGORY C. ALLEN, UNDERSTANDING AI TECHNOLOGY 5 (2020), https://www.ai.mil/docs/Understanding%20AI%20Technology.pdf.

7. *Id.* at 3.

A. The DoD Approach to AI

The U.S. Defense Innovation Board proposes five ethical principles for the employment of AI in defense, which were subsequently adopted by the Secretary of Defense on February 24, 2020.[8] The principles require that such systems be responsible, equitable, traceable, reliable, and governable.[9] In applying these principles, the Department of Defense (DoD) requires its personnel to be "responsible for the development, deployment, and use" of AI capabilities, while exercising "appropriate levels of judgment and care." Further, DoD will take "deliberate steps to minimize unintended bias in AI capabilities."[10] Armed forces personnel that develop and deploy AI capabilities must "possess an appropriate understanding of the technology, development processes, and operational methods" applicable to such capabilities, including "transparent and auditable methodologies, data sources, and design procedure and documentation."[11] The "safety, security, and effectiveness" of AI capabilities will be subject to testing and assurance throughout their lifecycles. DoD has directed its AI systems will also be reliable, having "explicit, well-defined uses." Lastly, the Pentagon will ensure that AI is engineered to fulfill its intended function, and to "detect and avoid unintended

---

8. C. Todd Lopez, *DoD Adopts Ethical Principles for Artificial Intelligence*, DEFENSE.GOV (Feb. 25, 2020), https://www.defense.gov/Explore/News/Article/Article/2094085/dod-adopts-5-principles-of-artificial-intelligence-ethics/; *see also* Press Release, U.S. Department of Defense, DOD Adopts Ethical Principles for Artificial Intelligence (Feb. 24, 2020), https://www.defense.gov/Newsroom/Releases/Release/Article/2091996/dod-adopts-ethical-principles-for-artificial-intelligence/.

9. These form five pillars of U.S. development and employment of AI systems clustered around:

(1) responsible use based on "appropriate levels of judgment and care;"

(2) equitable use that takes "deliberate steps to minimize unintended bias" in AI;

(3) use of AI that is "transparent and auditable," such that DoD personnel understand the technology, grasp how it is developed and its comprehend its operational applications;

(4) reliable of AI capabilities that are safe, secure and effective; and

(5) subject to governance designed to avoid unintended consequences, and that has built in "kill switches" or "circuit breakers" to deactivate lethal systems that demonstrate "unintended behavior."

DEFENSE INNOVATION BOARD, AI PRINCIPLES: RECOMMENDATIONS ON THE ETHICAL USE OF ARTIFICIAL INTELLIGENCE BY THE DEPARTMENT OF DEFENSE: SUPPORTING DOCUMENT 27–41 (2019), https://media.defense.gov/2019/Oct/31/2002204459/-1/-1/0/DIB_AI_PRINCIPLES_SUPPORTING_DOCUMENT.PDF [hereinafter AI PRINCIPLES].

10. *Id.*

11. *Id.*

consequences."[12] Systems that veer off course and display unexpected action will be disengaged or deactivated.[13]

These principles should be read in conjunction with the definition of AI in the FY 2019 National Defense Authorization Act:

> (1) Any artificial system that performs tasks under varying and unpredictable circumstance without significant human oversight, or that can learn from experience and improve performance when exposed to data sets.
>
> (2) An artificial system developed in computer software, physical hardware, or other context that solves tasks requiring human-like perception, cognition, planning, learning, communication, or physical action.
>
> (3) An artificial system designed to think or act like a human, Including cognitive architectures and neural networks.
>
> (4) A set of techniques, including machine learning, that is designed to approximate a cognitive task.
>
> (5) An artificial system designed to act rationally, including an intelligent software agent or embodied robot that achieves goals using perception, planning, reasoning, learning, communicating, decision making, and acting.[14]

This definition is further developed by the DoD Digital Modernization Strategy, which defines AI as machines that perform tasks that inform or reach decisions normally requiring human intelligence, such as pattern recognition, and forming conclusions and making predictions based upon "experience" (data).[15]

B. DoD and Autonomous Weapon Systems (AWS)

DoD has embarked on a major effort to apply AI to national security missions, including autonomous weapons.[16] Current AI military applications are confined to automated or narrow, task-specific systems to execute pre-

12. *Id.*
13. *Id.*
14. John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, § 238, 132 Stat. 1636 (2018).
15. U.S. DEPARTMENT OF DEFENSE, DIGITAL MODERNIZATION STRATEGY 44 (2019).
16. AI PRINCIPLES, *supra* note 9, at 29–34.

defined undertakings assigned by human experts. While it may be decades before general AI is achievable and integrated into the armed forces, defense applications already use machine learning to aid a range of military activities, from conducting predictive aircraft maintenance to processing intelligence, surveillance, and reconnaissance that inform military decisions.[17]

DoD defines autonomous weapons as those that, "once activated, can select and engage targets without further intervention by the human operator."[18] This definition includes human-supervised autonomous weapons that are designed to allow human operators to override the processes of the weapon but can "select and engage targets without further human input" after they are activated.[19]

The Pentagon has operated semi-autonomous (or more accurately, "automated")[20] systems for decades. The DoD defines "semi-autonomous weapon systems" as:

> 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. This includes:
>
> Semi-autonomous weapon systems that employ autonomy for engagement-related functions including, but not limited to, 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.[21]

The Navy's Phalanx or "Close in Weapons System" (CIWS, or "C-whiz") is a semi-autonomous weapon system. The CIWS is part of the Aegis

17. Sydney J. Freedberg Jr., *Artificial Intelligence Will Detect Hidden Targets in 2020 Wargame*, BREAKING DEFENSE (Oct. 21, 2019), https://breakingdefense.com/2019/10/artificial-intelligence-will-detect-hidden-targets-in-2020-wargame/.

18. U.S. Department of Defense, Directive 3000.09, Autonomy in Weapon Systems 13 (2012) (Incorporating Change 1, May 8, 2017), https://www.esd.whs.mil/Portals/54/ Documents/DD/issuances/dodd/300009p.pdf [hereinafter DoD Directive 3000.09]. *See also* United States, Characteristics of Lethal Autonomous Weapons Systems, ¶ 12, U.N. Doc. CCW/GGE.1/2017/WP.7 (Nov. 10, 2017).

19. DoD Directive 3000.09 *supra* note 18, at 13–14.

20. PAUL SCHARRE, ARMY OF NONE: AUTONOMOUS WEAPONS AND THE FUTURE OF WAR 31 (2018).

21. *Id.* at 14.

Combat System that integrates vertical-launch missiles and the Phalanx point defense gattling gun into a comprehensive anti-air warfare and anti-ballistic missile suite that can, if enabled, automatically track, target, and destroy incoming missiles and aircraft.[22] Aegis integrates computer and radar technology that can be configured to independently detect, control and engage inbound enemy targets for anti-air warfare and ballistic missile defense functions.[23] Humans are too slow to sort the data and make a timely decision. The system is emblematic of automatic or semi-autonomous systems in that humans control the production, programming, and application of the weapon.[24] The CIWS can be activated to run without humans "in the loop" of decision making, subject to an operator's decision to turn the system on or off – relegating the human to "on the loop." Semi-autonomous weapons also include: "fire and forget" or "lock-on-after-launch" homing munitions that rely on established tactics, techniques and procedures to maximize the probability of striking only targets within the seeker's "acquisition basket" that have been pre-selected by a human operator.[25] Aegis is in use by the naval forces of the United States, Japan, Spain, Norway, Korea and Australia, and is part of NATO's European missile defense system. As hypersonic missiles enter the inventories of the China, Russia, and the United States, as well as middle powers, France, Germany, Japan, and India, considerations such as time compression will become even more imperative.[26]

The relationship between the weapon and the operator raises ethical and legal issues regarding the role of humans, and the autonomy of machines, in making life-and-death decisions during armed conflict. The ethical issues concern the normative behavioral implications of using AI, while the legal issues concern the applicability of international rules governing armed

22. *Mk 15 – Phalanx Close-In Weapon System (CIWS)*, AMERICA'S NAVY, https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2167831/mk-15-phalanx-close-in-weapon-system-ciws/#:~:text=MK%2015%20Phalanx%20CIWS%20provides,have%20penetrated%20other%20fleet%20defenses (last updated Jan. 15, 2019). The Aegis Combat System is used by naval forces of the United States, Japan, Spain, Norway, Korea, and Australia, and is part of Japan's and NATO's European missile defense system.

23. Joseph T. Threston, *The AEGIS Combat System*, 121 NAVAL ENGINEERS JOURNAL, Oct. 2009, at 109, 111; Kelsey D. Atherton, *Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons*, NEW YORK TIMES (Nov 15, 2018), https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html.

24. PETER W. SINGER, WIRED FOR WAR: THE ROBOTICS REVOLUTION AND CONFLICT IN THE 21ST CENTURY 124–27 (2009).

25. DoD Directive 3000.09, *supra* note 18, at 14.

26. KELLEY M. SAYLER, CONG. RESEARCH SERV., R45811, HYPERSONIC WEAPONS: BACKGROUND AND ISSUES FOR CONGRESS 16 (2020).

conflict. AI may not be well-suited for all combat missions. There may be insufficient data to generate accurate patterns of behavior or the data may be ambiguous and not provide clear or tangible direction. AI may never be appropriate, due to ethical considerations rather than legal barriers, for some situations that pose catastrophic risk of failure, such as the decision to launch nuclear weapons. Even some tactical situations pose particularly complex problems that may require exceptionally nuanced trade-offs, special empathy, or choices among seemingly divergent ethics, or that implicate direct individual accountability. While there are clear situations in which the use of AI may not be appropriate, that does not obviate the technological imperative to apply AI throughout the networked force.

III. AWS AND THE LAW OF ARMED CONFLICT

Like any other method or means of warfare, AWS is subject to legal and policy considerations in design, development, testing, evaluation, and use. The United States has stated that "[a]lthough technology changes, the U.S. commitment to the law of war . . . does not."[27] The use of AWS in the kill chain must comply with LOAC.[28] LOAC stipulates that the right of

27. Christopher A. Ford, *AI, Human-Machine Interaction, and Autonomous Weapons: Thinking Carefully About Taking 'Killer Robots' Seriously*, 1 ARMS CONTROL AND INTERNATIONAL SECURITY PAPERS 1, 2 (2020).

28. The law of armed conflict is also referred to as "international humanitarian law," and forms the body of rules and regimes that regulate armed conflict. It is generally regarded as synonymous with the "law of war." OFFICE OF THE GENERAL COUNSEL, U.S. DEPARTMENT OF DEFENSE, LAW OF WAR MANUAL § 1.3.1.2 (rev. ed., Dec. 2016) [hereinafter DOD LAW OF WAR MANUAL]; *id.* § 2.2; HEADQUARTERS, DEPARTMENT OF THE ARMY, HEADQUARTERS, UNITED STATES MARINE CORPS, FM 6-27/MCTP 11-10C, THE COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE ¶¶ 1–4 (2019) [hereinafter COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE]; U.S. NAVY, U.S. MARINE CORPS & U.S. COAST GUARD, NWP 1-14M/MCTP 11-10B/COMDTPUB P5800.7A, THE COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS § 5.1 (2017) [hereinafter COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS].

combatants to choose their methods or means of warfare is not unlimited.[29] States are responsible for ensuring that their armed forces comply with LOAC.[30]

A. DoD Legal Review of Weapons and Weapon Systems

States Party to Additional Protocol I must subject any new "weapon, means or method" of warfare to legal review to ensure that its employment is not prohibited by law.[31] The U.S. position is that only weapons (means) must be reviewed as a matter of customary international law.[32] DoD tests, evaluates, and reviews weapons in accordance with their proposed use in physical and operational environments, anticipated rules of engagement, concepts of operations, and tactics, techniques and procedures that would govern their use. Weapons review must ensure new weapons or munitions do not cause suffering that is manifestly disproportionate to the military advantage reasonably expected from their use. States must determine whether a weapon can be controlled in such a manner that it is capable of being directed against a lawful target. In this regard, autonomous or semi-autonomous weapons undergo special reviews by the military Services and DoD before they enter formal development.[33]

Although the United States is not a State Party to Additional Protocol I, it conducts a legal review of all new weapons to ensure they "comply with applicable treaties and international agreements . . . customary international

29. Regulations Respecting the Laws and Customs of War on Land, annexed to Convention No. IV Respecting the Laws and Customs of War on Land art. 22, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539 [hereinafter Hague Regulations]; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts art. 35(1), June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I].

30. Convention No. IV Respecting the Laws and Customs of War on Land art. 3, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539.

31. Additional Protocol I, *supra* note 29, art. 36 (new weapons). It is debatable whether this rule has crystallized into customary international law. *See* Natalia Jevglevskaja, *Weapons Review Obligation under Customary International Law*, 94 INTERNATIONAL LAW. STUDIES 186, 220–21 (2018).

32. DOD LAW OF WAR MANUAL, *supra* note 28, § 6.2; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶ 2-4; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 9.1.

33. DoD Directive 3000.09, *supra* note 18, encl. 4, ¶ 8(b).

law, and the law of armed conflict."[34] This review is one component of the DoD Law of War Program, which establishes policy to "comply with the law of war during all armed conflicts . . . and in all other military operations."[35] The requirement is implemented, in part, by the armed services through the uniformed judge advocates.[36]

Sometimes the lawfulness of a method or means of warfare is debatable. For example, during the Vietnam War, the United States coupled airpower with the widespread use of anti-personnel weapons, napalm and cluster munitions, and it employed the new, small-caliber (5.56x45mm) M-16 rife, engaged in the Phoenix Program of political assassination, and destroyed crops to deprive insurgents of food in the countryside.[37] While States may differ in their interpretation of the lawfulness of weapons, the key to the rule of law is that those who develop and employ weapons, and those who decide upon their use, have certain duties under LOAC.[38]

New weapons may require clarification of existing law or development of new law to ensure they balance considerations of humanity and military necessity.[39] It is not foreseeable that the mere incorporation of AI into a

34. U.S. Department of Defense, DoD Directive 5000.01, The Defense Acquisition System 9 (2020) [hereinafter DoD Directive 5000.01]. *See also* U.S. Department of Defense, DoD Instruction 5500.15, Review of Legality of Weapons under International Law (1974).

35. U.S. Department of Defense, DoD Directive 2311.01, DoD Law of War Program § 1.2(a) (2020), http://www.dtic.mil/whs/directives/corres/pdf/231101e.pdf [hereinafter DoD Directive 2311.01].

36. *See* Headquarters, Department of the Army, AR 27-53, Legal Review of Weapons and Weapons Systems ¶ 4.f (2019) ("The Judge Advocate General's designee. TJAG's designee will—(1) Review weapons and weapon systems, including cyber weapons and cyber weapon systems, in accordance with this regulation to determine whether the weapons, weapon systems, cyber weapons, and cyber weapon systems and their intended use in combat are consistent with the international legal standards considered binding by the United States Government, whether derived from international agreements, customary international law, or a combination thereof."); *see also* Secretary of the Navy, SECNAVINST 5000.2F, Defense Acquisition System and Joint Capabilities Integration and Development System Implementation, encl. 3, ¶ 10(a) (2019) ("All potential weapons and weapon systems developed, acquired, or procured by the DON will be reviewed by the Judge Advocate General (JAG) of the Navy to ensure that the intended use of such weapons or weapon systems is consistent with domestic and international law."); Secretary of the Air Force, AFI 51-401, The Laws of War ¶ 2.1.2 (2018).

37. W. Hays Parks, *Means and Methods of Warfare*, 38 GEORGE WASHINGTON INTERNATIONAL LAW REVIEW 511, 512 (2006); Richard Falk, *Law and Responsibility in Warfare: The Vietnam Experience*, 4 INSTANT RESEARCH ON PEACE AND VIOLENCE 1, 4–8 (1974).

38. WILLIAM H. BOOTHBY, WEAPONS AND THE LAW OF ARMED CONFLICT 283 (2009).

39. Additional Protocol I, *supra* note 29, art. 1(2) (general principles and scope of application).

weapon system would make a new weapon unlawful, as AI is not prohibited or restricted by any specific rule of law or treaty.[40]

B. DoD Compliance with LOAC

LOAC is "that part of international law that regulates the resort to armed force; the conduct of hostilities and the protection of war victims in both international and non-international armed conflict; belligerent occupation; and the relationships between belligerent, neutral, and non-belligerent States."[41] It is DoD policy to comply with LOAC "during all armed conflicts, however characterized. In all other military operations, members of the DoD Components will continue to act consistent with the law of war's fundamental principles and rules."[42] This duty includes the obligation to "respect and to ensure respect" found in the the 1949 Geneva Conventions.[43] Compliance with LOAC conditions military effectiveness, encourages reciprocity by the

---

40. For example, the Russia Poseidon nuclear-armed underwater drone appears to be an unlawful weapon, per se, under the ENMOD Convention. Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques art. 1(1), May 18, 1977, 31 U.S.T. 333, 1108 U.N.T.S. 151. *See* Dave Makichuk, *Russia to Test 'Doomsday Drone' in High Arctic*, ASIA TIMES (May 26, 2020), https://asiatimes.com/2020/05/russia-set-to-test-doomsday-drone-in-high-arctic/; Franz-Stefan Gady, *Russia (Once Again) Announces Start of Sea Trials of 'Doomsday Weapon,'* THE DIPLOMAT (Dec 27, 2018), https://the-diplomat.com/2018/12/russia-once-again-announces-start-of-sea-trials-of-doomsday-weapon/. Russia (May 30, 1978), China (June 8, 2005), Japan (June 9, 1982), the United States (January 17, 1980), and the United Kingdom (May 16, 1978) are parties as of the date indicated to the Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques. *Disarmament: Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques*, https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXVI/XXVI-1.en.pdf (last visited Jan. 25, 2021).

41. DOD LAW OF WAR MANUAL, *supra* note 28, § 1.3; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-4–1-6; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 5.2.

42. DoD Directive 2311.01, *supra* note 35, § 1.2(a) .

43. Convention (I) for the Amelioration of the Condition of the Wounded and Sick in the Armed Forces in the Field art. 1, Aug. 12, 1949, 6 U.S.T. 3114, 75 U.N.T.S. 31 [hereinafter Geneva Convention I]; Convention (II) for the Amelioration of the Condition of the Wounded, Sick, and Shipwrecked Members of Armed Forces at Sea art. 1, Aug. 12, 1949, 6 U.S.T. 3217, 75 U.N.T.S. 85 [hereinafter Geneva Convention II]; Convention (III) Relative to the Treatment of Prisoners of War art. 1, Aug. 12, 1949, 6 U.S.T. 3316, 75 U.N.T.S. 135 [hereinafter Geneva Convention III]; Convention (IV) Relative to the Protection of Civilian Persons in Time of War art. 1, Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287 [hereinafter Geneva Convention IV].

adversary, and builds political support and legitimacy at home.[44] Rules of LOAC are based on key principles formed through treaties and customary international law, and mandate that the use of force in armed conflict is based on the principles of military necessity, humanity, proportionality, distinction, and honor or chivalry. New tactics and weapons technology must be evaluated to ensure they can be used in armed conflicts in accordance with these principles, and States have a duty to ensure that Soldiers, Sailors, Marines, and Airmen use them in that lawful fashion.

Military necessity justifies the use of all measures needed to defeat the enemy quickly and efficiently, so long as the methods and means employed are not otherwise prohibited by the law of war.[45] Destruction, seizure of persons and property, and alternate means of subduing an enemy, such as propaganda and intelligence gathering, are all justified during armed conflict, while causing unnecessary suffering is prohibited.

Combatants are entitled to inflict destruction, injury, and death on enemy combatants and lawful military targets.[46] The principle of humanity, however, forbids the infliction of suffering, injury, or destruction beyond what is necessary to accomplish a legitimate military purpose.[47] Elementary considerations of humanity may be regarded as the inverse of military necessity,

---

44. DOD LAW OF WAR MANUAL , *supra* note 28, § 18.2.

45. *Id.* § 2.2; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-23–1-27; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS *supra* note 28, § 5.3.1. *See also* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J Rep. 226, ¶ 140 (July 8); 1 CUSTOMARY INTERNATIONAL HUMANITARIAN LAW r. 70 (Jean-Marie Henckaerts & Louise Doswald-Beck eds., 2005). For historical context, *see* U.S. Department of War, Instructions for the Government of Armies of the United States in the Field, General Orders No. 100, Apr. 24, 1863 (commonly referred to as the Lieber Code).

46. Exec. Order No. 13,732, 3 C.F.R. § 13732 (2016); Jennifer O'Connor, General Counsel, U.S. Department of Defense, Address at NYU School of Law: Applying the Law of Targeting to the Modern Battlefield (Nov. 28, 2016), JUST SECURITY, https://www.justsecurity.org/34977/applying-law-targeting-modern-battlefield%E2%80%8E-full-speech-dod-general-counsel-jennifer-oconnor/ ("The citizen who does not participate in hostilities is to be spared in person, property, and honor as much as the exigencies of war will admit.").

47. DOD LAW OF WAR MANUAL, *supra* note 28, § 2.3; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-28–1-30; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 5.3.2. *See also* Military and Paramilitary Activities in and against Nicaragua (Nicar. v. U.S), Judgment, 1986 I.C.J. Rep. 14, ¶ 218 (June 27). For historical context, *see* 2 LASSA OPPENHEIM, INTERNATIONAL LAW § 67, at 227 (Hersch Lauterpacht ed., 7th ed. 1952) (The principle of humanity "postulates that all such kinds and degrees of violence as are not necessary for the overpowering of the opponent should not be permitted to a belligerent.").

since unnecessary actions are prohibited.[48] Generally, suffering is unnecessary if it is the inevitable result of the normal use and reasonably anticipated effects of military action that is needless, superfluous, or manifestly disproportionate in relation to the anticipated military advantage.[49]

The principle of proportionality dictates that combatants must refrain from attacks in which the expected loss or injury to civilians and damage to civilian objects are excessive compared to the anticipated concrete and direct military advantage.[50] The principle of proportionality does not spare civilians from harm that results from attacks, but the harm to civilians or civilian objects, or collateral damage, must not be excessive in relation to the expected military advantage.

Distinction requires parties to a conflict to distinguish between the armed forces and the civilian population.[51] Methods and means of warfare must discriminate between military and non-military targets, and especially between combatants and civilians. Additional Protocol I states that precautions in attack also encompass a duty by defending belligerents to "endeavor to remove" the civilian population from the vicinity of military objectives, a concept which overlaps with the principle of distinction.[52] The United States is not a State Party to AP I, but customary international law requires parties

48. Corfu Channel (U.K. v. Alb.), Judgment, 1949 I.C.J. Rep. 4, 22 (Apr. 9); DOD LAW OF WAR MANUAL, *supra* note 28, § 2.3.1.1.

49. DOD LAW OF WAR MANUAL, *supra* note 28, § 6.6; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1–28. *See also* MARCO SASSÒLI, INTERNATIONAL HUMANITARIAN LAW: RULES, SOLUTIONS TO PROBLEMS ARISING IN WARFARE AND CONTROVERSIES § 8.368 (2019).

50. DOD LAW OF WAR MANUAL, *supra* note 28, §§ 2.4, 5.1.2.5; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-44–1-48; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, §§ 5.3.3, 9.1.2. *See also* Additional Protocol I, *supra* note 29, arts. 51(5)(b), 57(2)(b); 1 CUSTOMARY INTERNATIONAL HUMANITARIAN LAW, *supra* note 45, at 14; Letter from Mr. Webster to Mr. Fox (Apr. 24, 1841), 29 BRITISH AND FOREIGN STATE PAPERS 1840-1841, at 1129 (1857).

51. DOD LAW OF WAR MANUAL, *supra* note 28, § 2.5; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-34–1-43; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 5.3.4. For historical context, see Letter from J. Fred Buzhardt, General Counsel, U.S. Department of Defense, to Senator Edward Kennedy (Sept. 22, 1972), *reprinted in* 67 AMERICAN JOURNAL OF INTERNATIONAL LAW 122 (1973); Ex parte Quirin, 317 U.S. 1, 30 (1942) ("By universal agreement and practice, the law of war draws a distinction between the armed forces and the peaceful populations of belligerent nations . . . .").

52. Additional Protocol I, *supra* note 29, art. 58 (precautions against the effects of attacks).

to a conflict, "to the extent feasible," to remove civilian persons and objects under its control "from the vicinity of military objectives."[53]

Not only must attacks comply with the rule of proportionality and distinction, but combatants also must ensure feasible precautions are taken to reduce incidental harm to civilians, other protected persons, and civilian objects.[54] Feasible precautions are those that are practicable or practically possible, taking into account all circumstances prevailing at the time, including humanitarian and military considerations.[55] Such precautions are wide ranging. Depending on the weapon system and the operating environment, precautions may require combatants to have an intimate grasp of how the weapon system functions and its relationship with that environment.

While not legally required for the deployment of every AWS, potential safeguards may include the following warning and monitoring mechanisms:

- operating status of the weapon system in real time so the commander can ensure it is operating within its programmed parameters;
- override functions;
- ability to assert positive human control during operations;
- ability to enable or disable learning functions;
- checks on how the system acquires and develops "learned behavior;" and
- resistance to cyberattack and associated counter measures to include system shutdown.

53. 1 CUSTOMARY INTERNATIONAL HUMANITARIAN LAW, *supra* note 45, r. 24.

54. DOD LAW OF WAR MANUAL, *supra* note 28, § 5.11; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-44–1-45; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 8.3.1. *See also* Additional Protocol I, *supra* note 29, art. 57. Thanks to Lieutenant Colonel John Cherry, USMC, and Squadron Leader Kieran Tinkler, RAF, both of the Stockton Center for International Law, who contributed to this analysis.

55. DOD LAW OF WAR MANUAL, *supra* note 28, § 5.14; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶ 2-12; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 8.3.1.

Combatants also must understand the targeting functions of the system, to include:

- how the weapon system defines targets;[56]
- ensuring that target functionality is set within only pre-defined boundaries;
- geographic restrictions;
- setting temporal restrictions on operation;
- the ability of the AWS to transition to preconfigured tests and a "safe state" in the event of critical systems failure.

Some of these safeguards may imply real-time control over the system, e.g. the ability to assert positive human control during operation and over-ride functions. This element is not legally essential, however. Many existing weapons without AI cannot be recalled or aborted and lack positive human control during operations, so imposing additional restrictions for AI systems would be an extraordinary decision based on policy and not the law.

Chivalry or honor is a core value of U.S. armed forces, and reflects an historic canon of fairness and observance of formalities and courtesies that forbid breaking trust with the enemy.[57] In particular, honor requires good faith on the part of belligerents to refrain from taking advantage of an opponent's adherence to the law by falsely claiming the law's protections, as in offering a false surrender in the hope of ambushing enemy forces.

The principles pose challenges in the context of fully autonomous weapons because such they do not yet exist and there are competing visions for how they will operate during armed conflict. The debate over the legality of AWS is driven by concern that such weapons must have a sufficiently rich human role in their design, production and operation, to ameliorate ethical concerns and ensure human accountability for compliance with LOAC. These issues are playing out at discussions held under the auspices of the UN Convention of Certain Conventional Weapons (CCW) through a Group of Governmental Experts (GGE).

---

56. The commander would have to know how an AI system would define a target or, in the alternative, how a system would act on the identification of the target by a human.

57. DOD LAW OF WAR MANUAL, *supra* note 28, § 2.6.2.2; COMMANDER'S HANDBOOK ON THE LAW OF LAND WARFARE, *supra* note 28, ¶¶ 1-31–1-33; COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS, *supra* note 28, § 5.3.5. For historical context, see 2 LASSA OPPENHEIM, INTERNATIONAL LAW: A TREATISE §§ 67, 84–85 (Ronald F. Roxburgh ed., 3rd ed. 1921).

IV. CCW GGE FOCUS ON HUMAN-MACHINE INTERACTION

The CCW effort is focused on identifying concerns and developing general principles associated with human-machine interaction, applicability of international law, and examining how those principles may be operationalized. Many believe new standards governing AI in military systems are required to ensure some threshold level of human interface or control in order to close a perceived gap in accountability.[58] "Smart" machines, they believe, defy "traditional ways of ascription" because no person has enough control to be accountable for them.[59] If AI fails to account for LOAC as effectively as a human mind, where does accountability lie? This view suggests that the manufacturer cannot be held liable for acts that it could not have predicted or even foreseen.[60] For proponents of regulation, it seems equally unfair to impose liability on commanders for actions of machines over which they "could not have sufficient control."[61]

To address these questions, in 2013 the High Contracting Parties of the CCW decided to convene the following year an informal gathering of a meeting of experts to consider LAWS and their potential compatibility and compliance with LOAC, in particular, the principles of international humanitarian law, the 1949 Geneva Conventions, the Martens Clause and customary law.[62] The CCW already regulates certain conventional weapons, with protocols that prohibit the use of non-detectable fragments (Protocol I), regulate employment of landmines and booby-traps (Protocol II) and incendiary

58. *See, e.g.*, Chairperson, Report of the 2014 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS), U.N. Doc. CCW/MSP/2014/3 (June 11, 2014) [hereinafter Report of 2014 Informal Meeting of Experts]; HUMAN RIGHTS WATCH, MIND THE GAP: THE LACK OF ACCOUNTABILITY FOR KILLER ROBOTS (2015), https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots.

59. Andreas Matthias, *The Responsibility Gap: Ascribing Responsibility for the Actions of Learning Automata*, 6 ETHICS AND INFORMATION TECHNOLOGY 176, 177 (2004).

60. *Id.*

61. *Id.* at 183.

62. Meeting of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Final Report, U.N. Doc. CCW/MSP/2013/10 (Dec. 16, 2013); Report of 2014 Informal Meeting of Experts, *supra* note 58, ¶ 26. *See also* 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, Oct. 10, 1980, 1342 U.N.T.S. 137.

weapons (Protocol III), prohibit the use of blinding lasers (Protocol IV), and regulate explosive remnants of war (Protocol V).[63]

From 2014 to 2016, informal meetings of experts were convened to explore these questions within the framework of the CCW.[64] In 2015, Germany as chair, submitted a "Food for Thought" paper that outlined many of the military, technological, ethical, and legal issues associated with the use of LAWS.[65] In 2016, the Chairperson of the meeting, Ambassador Michael Biontino of Germany, prepared for submission to the CCW Review Conference a paper in his personal capacity containing recommendations for establishment of a CCW Group of Government Experts (GGE) to begin meeting in 2017 to address options relating to emerging technologies and LAWS.[66]

Accountability has been central to the debate over autonomous weapons at the GGE.[67] Meeting in 2017, the GGE held discussions on LAWS

63. *See* Protocol on Non-Detectable Fragments, Oct. 10, 1980, 1342 U.N.T.S. 168 (Protocol I); Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices, Oct. 10, 1980, 1342 U.N.T.S. 168 (Protocol II); Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as Amended on 3 May 1996 May 3, 1996, 2048 U.N.T.S. 93 (Protocol II, amended); Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons, Oct. 10, 1980, 1342 U.N.T.S. 171 (Protocol III); Protocol on Blinding Laser Weapons, Oct. 13, 1995, 2024 U.N.T.S. 163 (Protocol IV); Protocol on Explosive Remnants of War 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, Nov. 28, 2003, 2399 U.N.T.S. 100 (Protocol V).

64. Report of 2014 Informal Meeting of Experts, *supra* note 58; Chairperson, Informal Meeting of Experts, Revised Annotated Programme of Work for the Informal Meeting of Experts on Lethal Autonomous Weapons Systems Geneva, 13 – 17 April 2015, U.N. Doc. CCW/MSP/2015/WP.1/Rev.1 (Mar. 11, 2015).

65. Chairperson, Food-for-Thought Paper, U.N. Doc. CCW/GGE.1/2017/WP.1 (Sept. 4, 2017).

66. Chairperson, Report of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS) annex, U.N. Doc. CCW/CONF.V/2 (June 2, 2016) (Recommendations to the 2016 Review Conference).

67. 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, Report of the 2018 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, ¶ 22, U.N. Doc. CCW/GGE.1/2018/3 (Oct. 23, 2018) [hereinafter Report of the 2018 Session of the GGE]; 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, Report of the 2017 Session Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS), ¶¶ 21(b), 23(a),

technology, military effects, and ethical and legal issues based on the Chairperson's 2015 "Food for Thought" paper.[68] The GGE met twice in both 2018 and 2019.[69]

The lines of argument have coalesced around whether LAWS should be subject to a new CCW protocol.[70] Some States propose negotiation of Protocol VI to the Convention to regulate or even ban LAWS – the latter option is supported by some NGOs.[71] Although the ICRC has not joined the call for a ban, it is moving in the direction of support for drafting a new protocol, at least to clarify the scope of human control in LAWS.[72] The European Parliament seeks a binding treaty to stop the development, production, or use of LAWS.[73] The Non-aligned Movement supports that outcome as well,

---

U.N. Doc. CCW/GGE.1/2017/3 (Dec. 22, 2017) [hereinafter Report of the 2017 Session of the GGE]. *See also* Carrie McDougall, *Autonomous Weapon Systems and Accountability: Putting the Cart Before the Horse*, 4 MELBOURNE JOURNAL OF INTERNATIONAL LAW 58, 74–76 (2019).

68. 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, Report of the 2017 Session Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS) (Advanced Version), U.N. Doc. CCW/GGE.1/2017/CRP.1 (Nov. 20, 2017) [hereinafter Report of the 2017 Session of the GGE (Advanced Version)]; Report of the 2017 Session of the GGE, *supra* note 67.

69. Report of the 2018 Session of the GGE, *supra* note 67; Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons System, Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, U.N. Doc. CCW/GGE.1/2019/3 (Sept. 25, 2019).

70. Report of the 2017 Session of the GGE, *supra* note 67, ¶ 10.

71. Matthew Bolton, Membership Secretary, International Committee for Robot Arms Control, Closing Statement to the 2015 U.N. CCW Expert Meeting, ICRAC (Apr. 17, 2015), https://www.icrac.net/icrac-closing-statement-to-the-2015-un-ccw-expert-meeting/; CAMPAIGN TO STOP KILLER ROBOTS, KEY ELEMENTS OF A TREATY ON FULLY AUTONOMOUS WEAPONS 3 (2019), https://www.stopkillerrobots.org/wp-content/uploads/2020/03/Key-Elements-of-a-Treaty-on-Fully-Autonomous-Weapons.pdf [hereinafter KEY ELEMENTS OF A TREATY].

72. International Committee of the Red Cross, Statement to the Convention on Certain Conventional Weapons (CCW) Group of Governmental Experts on Lethal Autonomous Weapons Systems, March 25–29, 2019, Geneva, https://www.unog.ch/80256EDD006B8954/(httpAssets)/59013C15951CD355C12583CC002FDAFC/$file/CCW+GGE+LAWS+ICRC+statement+agenda+item+5e+27+03+2019.pdf; *Views of the International Committee of the Red Cross (ICRC) on Autonomous Weapon System*, ICRC (Apr 11, 2016), https://www.icrc.org/en/document/views-icrc-autonomous-weapon-system.

73. Resolution on the Use of Armed Drones ¶ I.2(d), EUR. PARL. DOC. 2014/2567(RSP) (2014), https://www.europarl.europa.eu/doceo/document/TA-7-2014-0172_EN.html.

viewing a new protocol essential to ensuring autonomous functions remain under the "direct control and supervision of humans at all times."[74] Nearly thirty nations support banning LAWS. Austria and Brazil are among the most vocal, but the list also includes Algeria, Bolivia, Cuba, Costa Rica, Cuba, Ecuador, Egypt, Ghana, Guatemala, Holy See, Mexico, Nicaragua, Pakistan, Panama, Palestine, Peru, Venezuela, and Zimbabwe.[75]

Russia's position is that each State should set their own standards.[76] The United States opposes a ban.[77] Thus far, no NATO State has supported a ban. China purports to support a ban, but it defines LAWS exceedingly narrowly, to include systems with the "impossibility for termination" and that operate with "indiscriminate effect."[78] Such weapons are unlawful anyway, so the Chinese proposal to "ban" them is entirely specious. The wayward Chinese definition of LAWS underscores that there is no agreement on how to meaningfully and accurately characterize what it encompasses.

It is impractical to satisfy the most aspirational desires to ban such LAWS; indeed, semi-autonomous weapons already exist and includes a variety of automated weapons that have been employed by over thirty countries for over thirty years.[79] In great power competition, the logic of deterrence means major powers must develop AI systems, if only to deter potential adversaries. In this sense, systems that use AI will become essential to strategic security. Consequently, talk of banning them is simply unrealistic, particularly since CCW makes decisions by consensus. Most States agree there is a need

74. Venezuela on behalf of the Non-Aligned Movement (NAM) and Other States Parties to the Convention on Certain Conventional Weapons, General Principles on Lethal Autonomous Weapons, ¶ 9, U.N. Doc. CCW/GGE.1/2017/WP.10 (Nov. 13, 2017).

75. Campaign to Stop Killer Robots, *Country Views on Killer Robots* (Mar. 11, 2020), https://www.stopkillerrobots.org/wp-content/uploads/2020/03/KRC_CountryViews_11Mar2020.pdf.

76. Russian Federation, Russia's Approaches to the Elaboration of a Working Definition and Basic Functions of Lethal Autonomous Weapons Systems in the Context of the Purposes and Objectives of the Convention, ¶ 9, U.N. Doc. CCW/GGE.1/2018/WP.6 (Apr. 4, 2018) [hereinafter Russia's Approaches to the Elaboration of a Working Definition and Basic Functions of LAWS].

77. United States, Humanitarian Benefits of Emerging Technologies in the Area of Lethal Autonomous Weapon Systems, ¶ 40, U.N. Doc. CCW/GGE.1/2018/WP.4 (Mar. 28, 2018).

78. China, Position Paper, ¶ 3, U.N. Doc. CCW/GGE.1/2018/WP.7 (Apr. 11, 2018). *See also* COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, ¶ 1463 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987).

79. Chris Jenks, *False Rubicons, Moral Panic & Conceptual Cul-De-Sacs: Critiquing & Reframing the Call to Ban Lethal Autonomous Weapons,* 44 PEPPERDINE LAW REVIEW 1, 1 (2016).

for some form of human involvement in the design, development, and use of LAWS but stand against new regulation. A new CCW protocol that regulates LAWS without banning them is viewed as a middle ground, although even that may not materialize.[80]

There are two streams of thought that have been put forward to further specify that potential new standard: "meaningful human control" and "appropriate levels of human judgement."[81]

A. "Meaningful Human Control"

The U.K. non-governmental organization Article 36 seeks adoption of an explicit requirement for "meaningful human control" over the operation of AI weapon systems, and specifically over every individual attack.[82] Numerous States support this standard, although the definitions of the term vary.[83] Austria supports this standard because it views LAWS as by their nature lying outside of "meaningful human control."[84] The problem with "meaningful human control" as a standard is that like LAWS itself there is not a single interpretation of the term. Some consider it as a concept that ensures human

80. Austria, Brazil & Chile, Proposal for a Mandate to Negotiate a Legally Binding Instrument that Addresses the Legal, Humanitarian and Ethical Concerns Posed by Emerging Technologies in the Area of Lethal Autonomous Weapons Systems (LAWS), U.N. Doc. CCW/GGE.2/2018/WP.7 (Aug. 30, 2018).

81. Report of 2014 Informal Meeting of Experts, *supra* note 58, ¶ 20; United States, Human-Machine Interaction in the Development, Deployment and Use of Emerging Technologies in the Area of Lethal Autonomous Weapons Systems U.N. Doc. CCW/GGE.e/2018/WP.4 (Aug. 28, 2018), https://unog.ch/80256EDD006B8954/(httpAssets)/7C177AE5BC10B588C125825F004B06BE/$file/CCW_GGE.1_2018_WP.4.pdf [hereinafter United States, Human-Machine Interaction].

82. Austria, The Concept of "Meaningful Human Control" (Lethal Autonomous Weapons System, Expert Meeting, Geneva, April 13–17, 2015, Working Paper) [hereinafter Austria Working Paper]. *See also* Merel Ekelhof, *Autonomous Weapons: Operationalizing Meaningful Human Control*, HUMANITARIAN LAW & POLICY (Aug. 15, 2018), https://blogs.icrc.org/law-and-policy/ 2018/08/15/autonomous-weapons-operationalizing-meaningful-human-control/.

83. *See, e.g.*, Sandra de Jongh, Policy Officer, Ministry of Foreign Affairs, Netherlands, Statement delivered at Group of Governmental Experts on LAWS (Apr. 26, 2019), https://www.unog.ch/80256EDD006B8954/(httpAssets)/164DD121FDC25A0BC12583CB003A99C2/$file/5b+NL+Statement+Human+Element-final.pdf.

84. Laura Boillot, Program Manager for Article36, Statement at the 2015 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS): On the Way Forward (Apr. 17, 2015), https://www.unog.ch/80256EDD006B8954/(httpAssets)/24D931F6FCC8C43DC1257E2D002D9021/$file/2015_LAWS_MX_Art36_W.A.pdf.

control during the operation of a weapon (throughout the duration of an attack). Many proponents argue there is a temporal link between the initial assessment of LOAC in the context of conditions that justify using a weapon, and the assessment that is ongoing throughout the duration of the attack. If this link is broken, it raises problems with the human control over implementation of the law of war—in particular, the principles of proportionality, distinction and precautions. Austria questions whether a proportionality assessment made on the front end of the kill chain will be valid by the time the ordinance lands on the target.[85] The concern arises because the battlespace is dynamic. There is a risk that human-informed decisions programmed into LAWS before an attack will not be durable throughout the entire kill chain, as conditions quickly change.[86] The principle of proportionality requires an unbroken temporal link between the plan and the lethal strike so that proportionality is re-evaluated at each step of the chain. The related concept of precautions in attack may also be difficult for LAWS to implement without human intervention because it is unclear whether the initial plans reviewed by humans and executed by the machine would be capable of adjusting to dynamic battlefield conditions.[87] Michael C. Horowitz and Paul Scharre defined meaningful human control as a three-part test, which has become another influential standard for the term:

> 1. Human operators are making informed, conscious decisions about the use of weapons;
> 2. Human operators have sufficient information to ensure the lawfulness of the action they are taking, given what they know about the target, the weapon, and the context for action;
> 3. The weapon is designed and tested, and human operators are properly trained, to ensure effective control over the use of the weapon.[88]

The Campaign to Stop Killer Robots states that attacks that lack "meaningful human control" are unethical because they undermine human dignity by delegating "life-and-death decisions to inanimate machines" unable to comprehend the value of human life.[89] This approach finds it repugnant that

85. Austria Working Paper, *supra* note 82.

86. *Id.*

87. *Id.*

88. MICHAEL C. HOROWITZ & PAUL SCHARRE, MEANINGFUL HUMAN CONTROL IN WEAPON SYSTEMS: A PRIMER 4 (2015), https://s3.amazonaws.com/files.cnas.org/documents/Ethical_Autonomy_Working_Paper_031315.pdf?mtime=20160906082316.

89. KEY ELEMENTS OF A TREATY, *supra* note 71, at 3.

targeting during armed conflict could be done without control by a "true moral agent in the form of a human," who has a "conscience and the faculty of moral judgment," even if human judgment is inherently flawed.[90] Machines would be worse, they suggest, because they are incapable of the judgment required to comply with LOAC, such as weighing the proportionality of an attack. For example, Austria suggests that it is problematic to delegate to a robot weapon the assessment of whether an enemy soldier is "*hors de combat*."[91] In this view, it is unrealistic that LAWS could distinguish whether an enemy soldier was wounded or in the process of surrendering.[92] (It has been thirty years, however, since five Iraqi soldiers attempted to surrender to an unarmed U.S. Pioneer unmanned aerial vehicle).[93]

Proponents of "meaningful human control," suggest "'meaningful', 'effective' or 'appropriate' human control would be the type and degree of control that preserves human agency and upholds moral responsibility in decisions to use force."[94] "Control," advocates say, is a higher and broader standard than alternatives, such as "judgment." "Meaningful" control qualifies that such control must be more than superficial and is "less specific or outcome driven" than alternatives, such as "appropriate" or "effective" control.[95] This standard requires a sufficiently direct and close connection to be maintained between the human intent of the user and the eventual consequences of the operation of the weapon system in a specific attack. A human must always be "in the loop," particularly for selecting and engaging targets. But this position arguably bans LAWS, since such systems cease to be autonomous.[96]

More human control, however, does not necessarily mean more meaningful human control. If LAWS have greater accuracy, for example, they may be able to better identify and more accurately strike a specific location on a

90. Kenneth Anderson & Matthew Waxman, *Law and Ethics for Robot Soldiers*, POLICY REVIEW (Dec. 1, 2012), https://www.hoover.org/research/law-and-ethics-robot-soldiers.

91. Austria Working Paper, *supra* note 82.

92. *Id.*

93. Ted Shelsby, *Iraqi Soldiers Surrender to AAI's Drones*, BALTIMORE SUN (Mar. 2, 1991), https://www.baltimoresun.com/news/bs-xpm-1991-03-02-1991061100-story.html.

94. International Committee of the Red Cross, Ethics and Autonomous Weapon Systems: An Ethical Basis for Human Control?, ¶ 8.1, U.N. Doc. CCW/GGE.1/2018/WP.5 (Mar. 29, 2018); Report of the 2017 Session of the GGE (Advanced Version), *supra* note 67.

95. KEY ELEMENTS OF A TREATY, *supra* note 71, at 3.

96. William Boothby, Article 36, Weapons Reviews and Autonomous Weapons, Presentation at the 2015 Meeting of Experts on LAWS, 13 to 17 April 2015, https://www.unog.ch/80256EDD006B8954/(httpAssets)/616D2401231649FDC1257E290047354D/$file/2015_LAWS_MX_BoothbyS+Corr.pdf.

target with a smaller munition, such as a vulnerable hatch on an armored vehicle, with a reduced blast radius, minimizing collateral damage. In that case, less direct human control over the weapon could produce greater realization of the intention of the commander, which is to destroy the target while minimizing collateral effects. The United States believes that concerns expressed through human control can be better addressed by ensuring that LAWS are subject to "appropriate levels of human judgment."

B. "Appropriate Levels of Human Judgment"

The DoD requires that autonomous and semi-autonomous weapon systems shall be designed to allow commanders and operators to exercise "appropriate levels of human judgment over the use of force."[97] The United States has offered this standard during discussions at the GGE, noting that there is no single metric for determining the correct level of human control or judgment to be exercised over the use of force in AWS.[98] Human judgment over the use of force is different than human control over the use of force. For example, if the operator is reflexively pressing a button to approve strikes recommended by the weapon system, it could be argued that there is control, but little judgment is being exercised.[99]

"Appropriate levels of human judgment" is viewed as a holistic standard that accounts for the totality of the circumstances in the employment of a weapon. There is neither a single metric for what constitutes "appropriate levels," of judgment, just as there is not for what type of control would be "meaningful." Factors that are considered in determining the appropriate level of human judgment include the characteristics and features of the weapon system, how it will be employed in a specific physical operating environment, and the tactical context of applicable operational concepts and rules of engagement.[100]

97. DoD Directive 3000.09, *supra* note 18, ¶ 4(a).

98. United States, Human-Machine Interaction, *supra* note 81, ¶ 1.

99. *Id.* ¶ 11.

100. ROE ensure force is used consistent with military, political and legal objectives. *See* Chairman, Joint Chiefs of Staff, CJCSI 3121.01B, Standing Rules of Engagement (SROE)/Standing Rules for the Use of Force (SRUF) for U.S. Forces (2005).

C. The Fruitless Quest for a Common Standard

The terms under debate at the GGE are semantic, and labels only gain importance once they are defined or explained.[101] The disconnect between the two competing standards of human-machine integration is widened by additional concepts offered for consideration. Australia suggests that any use of force by LAWS must be executed through a "system of control," which it defines as "an incremental, layered approach," to exercise human control over the weapons, from "design through to engagement."[102] France has claimed that there is "no way to define the contours" of each actor's responsibility–the political and military decision-makers, manufacturers, programmers and operators of LAWS.[103] It is apparent many participants in the debate over autonomous weapons are talking past each other.[104] This dysfunctional dynamic of the negotiations is evident in the array of terms represented in the table below used during discussions of human-machine interaction in the development, deployment, and use of LAWS.

Maintaining	**Substantive**	**Human**	**Participation**
Ensuring	Meaningful		Involvement
Exerting	Appropriate		Responsibility
Preserving	Sufficient		Supervision
	Minimum level of		Validation
	Minimum indispensable extent of		Control
			Judgment
			Decision

Table: Terms listed non-exhaustively by the Chair for further discussion.[105]

101. Merel Ekelhof, *Moving Beyond Semantics on Autonomous Weapons: Meaningful Human Control in Operation*, 10 GLOBAL POLICY 343, 344 (Table 1) (2019), https://onlinelibrary.wiley.com/doi/epdf/10.1111/1758-5899.12665.

102. Australia, Australia's System of Control and Applications for Autonomous Weapon Systems, ¶¶ I.3, II, U.N Doc. CCW/GGE.1/2019/WP.2/Rev.1 (Mar. 26, 2019).

103. France, Legal Framework for Any Potential Development and Operational Use of Future Lethal Autonomous Weapons Systems (LAWS) 2, (2016 Meeting of Experts on LAWS, Working Paper, Apr. 2016).

104. McDougall, *supra* note 67, at 60.

105. Report of the 2018 Session of the GGE*, supra* note 67, annex III, ¶ 22.

The quest to develop a standard for human-machine integration in LAWS is motivated by the desire to ensure that humans, who are responsible under LOAC for decisions on the battlefield, are held accountable for the results of those decisions. Human control over AI systems will be exercised in a different manner because it changes the tasks that humans do in armed conflict, but it does not take away the responsibility of humans to create a gap in accountability. But no matter what terms or standards are used, for some observers, if there is a gap it can never be closed for AI systems because the machine has an informational advantage over the operator, whether it is in navigation of autonomous vehicles or radar-based flight control.[106] Humans are too slow, incapable of sifting through enough data quickly enough to control the analytical process. This perspective concludes that the designer of the machine gradually loses control over it, transferring control from the human to the machine itself.[107] Humans in the loop are not just redundant–as illustrated by the Aegis system–they are disadvantageous.[108]

In this respect, it is difficult not to conclude that it will be impossible to assign human responsibility for the actions of AWS through some type of globally-accepted standard.[109] As Russia stated, "[a]ttempts to develop certain universal parameters of the so-called "critical functions," for the wide variety of anticipated systems, "can hardly give practical results."[110] In the end, the CCW GGE process likely will prove a disappointment. Any agreement that emerges from the GGE is likely to be too vague to provide meaningful guidance.

Fortunately, no new legal standard is needed to ensure accountability of AWS during armed conflict. The existing principles and rules in LOAC already provide a comprehensive and coherent framework that governs the use of force, including AI networked weapons. Human accountability for the employment and effects of AI weapons derives from the military doctrine of command accountability. The commander has direct or individual accountability for all actions taken during war, including the employment of LAWS. Military commanders bear the burden of full accountability for the entire scope of their prosecution of the war effort, including employment of

106. Matthias, *supra* note 59, at 182.

107. *Id.*

108. Robert Sparrow, *Killer Robots*, 24 JOURNAL OF APPLIED PHILOSOPHY 62, 68 (2007).

109. *Id.*

110. Russia's Approaches to the Elaboration of a Working Definition and Basic Functions of LAWS, *supra* note 76, ¶ 9.

appropriate weapons during the conflict, how those weapons are applied in the operational environment, and the consequences for their successes and their failures, both anticipated and unforeseen.

V. MILITARY ACCOUNTABILITY

Regardless of the standards for human involvement or oversight of AWS that may be adopted by the GGE, it is clear the law binds humans, not machines.[111] Commanders are required to select appropriate and lawful weapons under the circumstances. Some weapons, such as biological weapons or poisonous gas, are illegal per se. The Annexed Regulations of Hague Convention (IV) prohibit the use of certain weapons that are "calculated to cause unnecessary suffering," and customary law prohibits indiscriminate methods and means of warfare.[112] The legality of most weapons, however, is based on how they are employed by combatants and under the direction of a commander. For example, a rifle is a lawful weapon, but soldiers may on their own use it in an unlawful manner or officers may direct its misuse through unlawful orders. Likewise, AWS may be appropriate in one circumstance or operational environment but not in another. In both cases, the commander remains accountable for the discharge of the round. The key for accountability is that someone is held to account for every method and means of warfare, and that person is the military commander.

All members of the U.S. armed forces have a duty to comply with the law of war.[113] The United States believes that compliance with the law of war aids the commander and the Nation by reinforcing military effectiveness through disciplining the application of force and economy of effort, encouraging reciprocal respect for the rules by the enemy, and maintaining public support and legitimacy for the war effort in a democracy.[114] The DoD Law of War Program requires U.S. forces to maintain a system of reporting concerning incidents that a unit commander or other responsible official determines, based on credible information, potentially involves: a war crime; other violations of the law of war; or conduct during military operations that would

111. Marco Sassóli, *Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified*, 90 INTERNATIONAL LAW STUDIES 308, 323 (2014).

112. Hague Regulations, *supra* note 29, art. 23(e). *See also* 1 CUSTOMARY INTERNATIONAL HUMANITARIAN LAW, *supra* note 45, rr. 11, 70.

113. DOD LAW OF WAR MANUAL, *supra* note 28, §§ 18.3, 18.3.1.1.

114. *Id.* § 18.2.

be a war crime if the military operations occurred in the context of an armed conflict.[115] This program also requires the personal involvement of commanders who convene and direct investigations and refer matters to courts marital, or to more senior authorities, for disposition.[116]

Subordinate commanders have a duty to keep immediate superiors appraised of events and incidents during hostilities.[117] All military and U.S. civilian employees, contractor personnel, and subcontractors assigned to or accompanying a DoD Component must report through their chain of command all reportable incidents, including those involving allegations of non-DoD personnel having violated the law of war.[118] Violations of "reportable incidents" may be made to military police, judge advocates, or inspectors general. All reports must be forwarded immediately through the chain of command to the combatant commander by the most expeditious means available.[119] If warranted, criminal cases may be brought under the Uniform Code of Military Justice.[120] Suspected violators may be charged with "grave breaches" of the Geneva Conventions, which entail violations against designated protected persons or property.[121] Furthermore, such violations are subject to universal jurisdiction, and include murder, torture, mutilation or maiming, inhumane treatment, or willfully causing great suffering or injury, and they are punishable by death.[122] AP I adds other offenses to the list of grave breaches: attacks that unleash dangerous forces that will produce "excessive loss of life, injury to civilians or damage to civilians objects," and attacks on demilitarized zones and undefended localities.[123]

Commanders are said to be "in command," meaning they have authority over the armed forces, and the "power to give orders and enforce

115. DoD Directive 2311.01, *supra* note 35, § G.2.

116. *See* Headquarters, Department of the Army, AR 15-6, Procedures for Administrative Investigations and Boards of Officers (2016); Headquarters, Department of the Army, AR 195-2, Criminal Investigation Activities (2020).

117. U.S. Department of Navy, United States Navy Regulations ¶ 0706 (rev. ed., 1990) [hereinafter Navy Regulations] (Responsibility and Authority of Commanders.).

118. DoD Directive 2311.01, *supra* note 35, § 4.1(a).

119. *Id.* § 4.2

120. Uniform Code of Military Justice, 10 U.S.C. §§ 801–906(a) (2018).

121. Geneva Convention I, *supra* note 43, art. 50; Geneva Convention II, *supra* note 43, art.51; Geneva Convention III, *supra* note 43, art.130; Geneva Convention IV, *supra* note 43, art.. 147.

122. War Crimes, 18 U.S. Code § 2441 (2018).

123. Additional Protocol I, *supra* note 29, arts. 85(3)(c), 85(3)(d), 59(1).

obedience."[124] Commanders are the agents of the State, they exercise authority to control the forces under their command and implement and enforce the law of war.[125] With the vast authority of commanders comes great responsibility while they serve in command. These leaders have authority commensurate with their responsibilities, exercised through intermediate subordinate commanders.[126]

A. The Military Doctrine of Command Accountability

By whatever title they take–commander, commanding officer, commandant–officers who lead units of the armed forces are accountable for the performance of the forces subject to their authority.[127] In U.S. joint force doctrine, the term "command" is all-encompassing, to include the authority and responsibility to organize, direct, coordinate, and control military forces to accomplish missions.[128] It also includes responsibility for health, welfare, morale and discipline of all subordinates. The art of command flows from the commander's ability to use leadership to maximize performance.[129] "Clear commander's guidance and intent, enriched by the commander's experience and intuition, enable joint forces to achieve objectives."[130] Historically, the most senior military officers were held accountable for the general performance of their troops in combat. The commander leads through a combination of "courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views…."[131] In the Navy, commanders are required to observe the principles of international law.[132] In order to fulfill that responsibility, if there is a conflict between international law and other Navy regulations, commanders are authorized to uphold

124. Rome Statute of the International Criminal Court art. 28, July 17, 1998, 2187 U.N.T.S. 90.

125. DOD LAW OF WAR MANUAL, *supra* note 28, § 18.4. *See* Geneva Convention I, *supra* note 43, art. 45; Geneva Convention II, *supra* note 43, art. 46; Convention No. X for the Adaptation to Maritime Warfare of the Principles of the Geneva Convention art. 19, Oct 18, 1907, 36 Stat. 2371, T.S. No. 543.

126. Navy Regulations, *supra* note 117, ¶ 0702 (Responsibility and Authority of Commanders).

127. *Id.* ¶ 0802 (Responsibility).

128. Chairman, Joint Chiefs of Staff, JP 3-0 CH1, Joint Operations ¶ II-2 (rev. ed., Oct. 2018).

129. *Id.*

130. *Id.*

131. *Id.*

132. Navy Regulations, *supra* note 117, ¶ 0705 (Observance of International Law).

international law.[133] The Hague Regulations hold commanders are directly or individually responsible for methods and means of warfare during the conduct of hostilities.[134]

American commanders must authorize the employment of any method or means of war and craft appropriate rules of engagement that accomplish the mission. Obedience to orders is a cornerstone of military discipline and order, and while subordinates owe obedience only to lawful orders, all orders are presumed to be lawful unless that presumption is rebutted.[135] Accountability for these orders has always been an inherent element of U.S. military leadership.[136] Punishment for violations of LOAC fall on individuals for the commission of acts committed at their order or command or acts they personally commit.[137]

In the aftermath of World War I and II, States recognized that any person, including heads of state or commanders-in-chief, are subject to the laws of war and are liable to criminal prosecution for their violation.[138] Military commanders are accountable for violations of LOAC that they personally commit or that they order their subordinates to commit.[139] Leaders may be held personally accountable for committing an offense, even when subordinates physically fulfill the material elements of the crime they have directed.[140] For example, commanders are directly liable for a range of international criminal acts that they commit during the conduct of hostilities: crimes against peace (planning and initiating war of aggression); war crimes

133. *Id.*

134. Hague Regulations, *supra* note 29, art. 1.

135. Rome Statute of the International Criminal Court, *supra* note 124, art. 33.

136. DOD LAW OF WAR MANUAL, *supra* note 28, § 18.2.

137. Hans Kelsen, *Collective and Individual Responsibility in International Law with Particular Regard to the Punishment of War Criminals*, 31 CALIFORNIA LAW REVIEW 530, 542 (1943).

138. *Commission on the Responsibility of the Authors of the War and on Enforcement of Penalties*, 14 AMERICAN JOURNAL OF INTERNATIONAL LAW 95, 117 (1920), *reprinted from* Pamphlet No. 32, Division of International Law, Carnegie Endowment for International Peace; Charter of the International Military Tribunal art. 7, Aug. 8, 1945, 59 Stat. 1548, 82 U.N.T.S. 288 [hereinafter Nuremberg Charter].

139. United States v. Calley, 48 C.M.R. 19, 27 (1973); Prosecutor v. Milošević, IT-98-291/1-T, Judgment, ¶ 966 (Int'l Crim. Trib. for the former Yugoslavia Dec. 12, 2007), https://www.icty.org/x/cases/dragomir_milosevic/tjug/en/071212.pdf (the accused was in "command and control of his troops"); Hague Regulations, *supra* note 29, art. 1.

140. Prosecutor v. Delalić, Case No. IT-96-21-T, Judgment (Int'l Crim. Trib. for the former Yugoslavia Nov. 16, 1998), https://www.icty.org/x/cases/mucic/tjug/en/981116_judg_en.pdf; Prosecutor v. Prlić, Case No. IT-04-74-T, Judgment, ¶ 239 (Int'l Crim. Trib. for the former Yugoslavia May 29, 2013), https://www.icty.org/x/cases/prlic/tjug/en/130529-1.pdf.

(violations of the laws or customs of war); and crimes against humanity, including murder, extermination, and enslavement.[141] The commander's direct or individual accountability includes genocide and crimes against humanity that are committed by their forces at their direction, and for the consequences of decisions they have made or authorized for the employment of weapons on the battlefield.

Commanders are individually subject to prosecution for violation of other crimes as well, including planning violations of LOAC.[142] The commander is accountable for employment of indiscriminate methods or means. Nazi Germany's V-1 and V-2 rockets were indiscriminate missiles because they could not be directed at a target. They were used as terrorizing weapons by randomly landing in civilian areas.[143] The developers of those missiles, principally Waffen-SS General Hans Kammler and Wernher von Braun, avoided criminal prosecution after the war because Kammler was reportedly never found, and von Braun benefited from his singular importance to the fledgling American missile program. Perhaps more compelling in the case of von Braun, however, was that the Allies had engaged in even more destructive, indiscriminate bombing of Axis cities. Some 25,000-35,000 civilians died in four brutal firebombing raids on Dresden in February 1945, while the V-2 rocket is estimated to have killed fewer than 3,000 Londoners.[144]

Similarly, Nazi Grand Admiral Karl Döenitz, was tried and convicted at Nuremberg for war crimes committed during the war for his role as the commander-in-chief of the German Navy. The International Military Tribunal (IMT) found that the Admiral's order to sink neutral vessels without warning when found within declared operational areas was a violation of the 1936 Naval Protocol, which reaffirmed the rules of submarine warfare set out in the 1930 London Naval Agreement.[145] He was also found guilty of violating the rescue provisions of the Protocol, finding that "if the commander cannot

---

141. Nuremberg Charter, *supra* note 138, art. 6(c).

142. ILIAS BANTAKAS, PRINCIPLES OF DIRECT AND SUPERIOR RESPONSIBILITY IN INTERNATIONAL HUMANITARIAN LAW 43–49 (2002)

143. COMMENTARY ON THE ADDITIONAL PROTOCOLS, *supra* note 78, ¶ 1958.

144. Valentine Low, *German Report Says Dresden Firebomb Toll Was Exaggerated*, TIMES (London) (Mar. 18, 2010), https://www.thetimes.co.uk/article/german-report-says-dresden-firebomb-toll-was-exaggerated-bl8ftqqs9b2 (an estimated 25,000 civilians died in the Dresden bombings); DENNIS PISZKIEWICZ, THE NAZI ROCKETEERS: DREAMS OF SPACE AND CRIMES OF WAR 197 (1995) (in the United Kingdom, over 2,700 people were killed by over 1,300 V-2 rockets fired during the war).

145. 1 TRIAL OF THE MAJOR WAR CRIMINALS BEFORE THE INTERNATIONAL MILITARY TRIBUNAL, NUREMBERG, 14 NOVEMBER 1945 – 1 OCTOBER 1946, at 312 (1947).

rescue, then under its terms he cannot sink a merchant vessel and should allow it to pass harmless before his periscope."[146]

However, in view of the conduct and arming of British merchant ships during the war, the IMT did not find Admiral Döenitz guilty for his conduct of unrestricted submarine warfare against British armed merchant ships.[147] Because of the British Admiralty's order of May 8, 1940, that "all vessels should be sunk at night in the Skagerrak," and the fact that the United States admitted to conducting unrestricted submarine warfare in the Pacific Ocean from the first day it entered the war against Japan in 1941, the admiral was not sentenced for his breaches of the international law of submarine warfare.[148] (Döenitz was convicted and served ten years for separate "crimes against the peace").

In all cases, commanders are accountable for the operational and legal judgments inherent in warfighting. Commanders employing an AI weapon system are no different. They have an obligation to understand what AWS can do in a particular environment in which it is used, like any other weapon.[149] They must know how the system responds in the field or at sea, where it excels and what are its limitations. They are not required to understand the intricacies of how the weapon works–the science and technology behind its performance–only appreciate how it functions and performs in the battlespace in which it is employed. In the event an AWS proves to be indiscriminate the commander would be held to account. Every weapon system in the combat zone and every method of training – tactics, techniques and procedures – falls within the remit of the commander's direct or individual accountability.

Human Rights Watch worries that it is "arguably unjust" to hold commanders to account for the action of machines "over which they could not have sufficient control."[150] "These weapons' autonomy creates a 'responsibility gap,'" making it "arguably unjust to hold people responsible where they "could not have sufficient control."[151] This notion of responsibility, however, is too narrow, swallowed by military accountability. Although it may seem "unfair" to impose liability on commanders for incidents occurring

146. *Id.* at 313.

147. *Id.* at 312.

148. *Id.* at 313.

149. DoD Directive 3000.09, *supra* note 18, ¶ 4(a)(1)(a).

150. HUMAN RIGHTS WATCH, LOSING HUMANITY: THE CASE AGAINST KILLER ROBOTS 42 (2012), https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots.

151. *Id.*

beyond their immediately control, and to sanction them even for mishaps they sought to avoid, the armed forces routinely do just that.[152] The U.S. armed forces consistently impose accountability on commanders for literally everything that occurs throughout his or her entire force, from sexual harassment to peacetime ship collisions to battlefield disasters. The burden of command, and the unique exposure to perhaps "unfair" liability is simply part of direct or individual command accountability and it is subsumed by the duty owed by commanders to the armed forces and to the Nation they serve.

As Marco Sassóli states, "it is as fair to hold a commander of a robot accountable as it would be to hold accountable a commander who instructs a pilot to bomb a target he describes as a military headquarters, but which turns out to be a kindergarten."[153] The commander's accountability, in this regard, is complete, even if some outsiders view it as "unfair"–even if the commander had no way of personally intervening to ensure a better outcome, indeed even if the commander optimized training and preparation of his or her forces to avoid such an outcome. This is the approach used in warship collisions and other operational mishaps in order to hold leaders accountable and to develop "lessons learned" to avert future incidents. In the culture of direct accountability within the armed forces, loss of faith or confidence in the individual commander can result in criminal or administrative sanctions. For example, after the June 2017 collision by the USS *Fitzgerald* into the Motor Vessel *Acx Crystal* that killed seven sailors, the commanding officer and the officer in charge of the combat information center were issued letters of censure.[154] The evidence was deemed insufficient to prevail against them in a criminal trial, even though the investigation uncovered ineffective command and control and deficiencies in training and navigational skill.[155] In cases in which LOAC violations do not rise to the level

152. Robert Sparrow, *Killer Robots*, 24 JOURNAL OF APPLIED PHILOSOPHY 62, 74 (2007).

153. Marco Sassóli, *Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified*, 90 INTERNATIONAL LAW STUDIES 308, 324 (2014).

154. Geoff Ziezulewicz, *Worse Than You Thought: Inside the Secret Fitzgerald Probe the Navy Doesn't Want You to Read*, NAVYTIMES, (Jan. 13, 2019), https://www.navytimes.com/search/22606662/?q=Worse+Than+You+Thought%3A+Inside+the+Secret+Fitzgerald+Probe+the+Navy+Doesn%E2%80%99t+Want+You+to+Read.

155. The investigation determined that the collision and fatalities resulted from: (1) Failure to plan for safety; (2) failure to adhere to sound navigation practice; (3) failure to execute basic watch standing practices; (4) failure to properly use available navigation tools;

of war crimes, States typically pursue administrative mechanisms of accountability, initiating investigations and imposing non-judicial punishment or administrative censure.[156]

As a supplement to the criminal process, "administrative procedures, inquiries, sanctions, and reforms" may be used to respond to violations of LOAC, such as negligent actions that lack criminal culpability.[157] For example, the investigation of the shootdown by the USS *Vincennes* of Iran Air Flight 655 on July 3, 1988, exonerated the commanding officer of the warship. In that case, the commanding officer gave the order to target what he thought was an Iranian F-14 aircraft inbound to attack his warship–a calculation that proved tragically wrong. Two-hundred ninety civilian Iranian lives were lost. After an investigation, the Secretary of Defense concluded that the captain acted prudently, given the high threat environment and previous attacks and demonstrations of hostile intent by the forces of the Iranian Revolutionary Guard Corps Navy on U.S. warships.[158] The investigating officer, a rear admiral, recommended that no administrative or criminal action should be taken against the captain. This recommendation was endorsed by the Secretary of Defense.[159]

Similarly, Laura Dickinson recounts administrative findings of a U.S. Army investigation on the errant U.S. airstrike on October 3, 2015, against a Kunduz, Afghanistan, hospital operated by the humanitarian organization *Medecins Sans Frontieres* (MSF) that killed 24 patients, fourteen staff members

---

and (5) failure to respond deliberately and effectively when in extremis. See Memorandum from Office of the Chief of Naval Operations, Department of the Navy, to Distribution, Collision Report for USS Fitzgerald and USS John S. McCain Collisions, http://s3.amazonaws.com/CHINFO/USS+Fitzgerald+and+USS+John+S+McCain+Collision+Reports.pdf (last visited Jan. 25, 2021).

156. Laura A. Dickinson, *Lethal Autonomous Weapons Systems: The Overlooked Importance of Administrative Accountability*, *in* THE IMPACT OF EMERGING TECHNOLOGIES ON THE LAW OF ARMED CONFLICT 69, 84–85 (Ronald T.P. Alcala & Eric Talbot Jensen eds., 2019).

157. *Id.* at 71.

158. Memorandum from Secretary of Defense to Secretary of the Navy, Formal Investigation into the Circumstances Surrounding the Downing of Iran Air Flight 655 on 3 July 1988, at 61 (Aug. 19, 1988), https://www.jag.navy.mil/library/investigations/VINCENNES%20INV.pdf.

159. Rear Admiral William H. Fogarty, USN, Investigation Report, Formal Investigation into the Circumstances Surrounding the Downing of a Commercial Airliner by the USS Vincennes (CG 49) on 3 July 1988 (July 28, 1988), *id.,* attachment at 51.

and four caretakers.[160] A cascade of errors led to the tragic airstrike. Some of those involved received administrative penalties or disciplinary action, although they were not charged with a crime.[161] A comprehensive review of tactical directives, pre-deployment training, and rules of engagement followed.[162] The Secretary of Defense took corrective action to avoid another such incident. The military departments were directed to review command-and-control systems to ensure that they could maintain a "unified understanding of the battle space and enhance interoperability."[163] In another incident, this one in Iraq in 2003, Lieutenant Colonel Allen West was fined $5,000 and retired after he was found to have threatened the life of an Iraqi by discharging a firearm.[164] These cases demonstrate that DoD investigates mishaps and reviews decisions during hostilities, and takes administrative action to supplement criminal prosecution. These measures hold military leaders accountable through non-judicial and administrative processes in cases lacking criminal culpability to obtain convictions at trial.

Commanders may also be held responsible for violations of LOAC committed by their subordinates if they have failed to properly train their force, exercise appropriate oversight, or establish guidance and expectations in command environment conducive to compliance with the law. The international law doctrine of command responsibility is a subset of the military doctrine of command accountability.

---

160. Dickinson, *supra* note 156, at 84–85. *See* Alissa J. Rubin, *Airstrike Hits Doctors Without Borders Hospital in Afghanistan*, NEW YORK TIMES (Oct. 3, 2015), https://www.nytimes.com/2015/10/04/world/asia/afghanistan-bombing-hospital-doctors-without-borders-kunduz.html; Tim Craig, *Doctors Without Borders says U.S. Airstrike Hit Hospital in Afghanistan; at Least 19 Dead*, WASHINGTON POST (Oct. 3, 2015), https://www.washingtonpost.com/world/doctors-without-borders-airstrike-hits-afghan-hospital-killing-3-staffers/2015/10/03/2ed13104-b50a-48ec-9eb9-92db8ee3a876_story.html.

161. Jim Garamone, *Centcom Commander: Communications Errors, Human Error Led to Attack on Afghan Hospital*, U.S. DEP'T OF DEFENSE (Apr. 29, 2016), https://www.defense.gov/Explore/News/Article/Article/746393/centcom-commander-communications-breakdowns-human-errors-led-to-attack-on-afgha/.

162. Memorandum from the Secretary of Defense to the Secretaries of the Military Departments et al., Secretary of Defense Guidance (Apr. 28, 2016), https://www.hsdl.org/?abstract&did=792301.

163. *Id.*

164. *U.S. Officer Fined for Harsh Interrogation Tactics*, CNN.COM (Dec. 13, 2003), https://www.cnn.com/2003/US/12/12/sprj.nirq.west.ruling/. Allen West went on to serve one term in the U.S. House of Representatives, representing Florida's 22nd congressional district from 2011 to 2013.

B. The International Legal Doctrine of Command Responsibility

With military command comes the special duty of oversight. Commanders must ensure that their forces are properly trained and adopt and enforce rules and procedures for investigating suspected violations of LOAC and impose administrative, disciplinary and penal actions to correct them.[165] Commanders have an obligation to take measures within their power and appropriate to the circumstances to prevent violations by the forces under their command.[166]

The United States extends this classic legal doctrine of "command responsibility" to its outer boundaries. As the Supreme Court held in the *Yamashita* decision, U.S. commanders are responsible "to some extent" even for the actions of their subordinates.[167] Edging close to vicarious liability, the U.S. position underscores the vast authority and virtually plenary responsibility of U.S. military commanders for the decisions of subordinates. Liability attaches to the most senior commander who issues the orders, downward to all of the subordinate commanders who transmit and distribute it throughout the chain of command.

The legal doctrine of command or superior responsibility holds the superior officer accountable for the failure to prevent or punish many of the war crimes committed by subordinates.[168] This legal concept holds the commander liable for "willful blindness" for failing to prevent or stop the illegal acts of his or her subordinates.[169] Commanders have an affirmative duty to prevent LOAC violations, and they may acquire derivative, imputed liability by commission or omission.[170] They are also responsible for decisions by their subordinates to disregard LOAC violations committed by their forces that they are aware of, or reasonably should have been aware of, or that they

165. DOD LAW OF WAR MANUAL, *supra* note 28, §§ 18.4.4, 18.4.2–18.4.3.

166. *Id.* § 18.4. *See also* Yamashita, 327 U.S. 1, 15–16 (1946); French Ordinance of August 28, 1944, Concerning the Suppression of War Crimes art. 4, *quoted in* 4 LAW REPORTS OF TRIALS OF WAR CRIMINALS 87 (1948).

167. *Yamashita*, 327 U.S. at 15.

168. Nico Keijzer, *A Plea for the Defence of the Superior Order*, 8 ISRAEL YEARBOOK ON HUMAN RIGHTS 78, 80–84 (1978); YORAM DINSTEIN, THE DEFENCE OF 'OBEDIENCE TO SUPERIOR ORDERS' IN INTERNATIONAL LAW, at viii–ix (2012).

169. *Delalić*, *supra* note 140; *Prlić*, *supra* note 140, ¶ 387.

170. GEOFFREY S. CORN, KEN WATKIN & JAMIE WILLIAMSON, THE LAW IN WAR: A CONCISE OVERVIEW 234 (2018).

acquiesced in or failed to take action to punish.[171] Liability extends beyond the direct perpetrators of the crime.[172] Commanders also bear responsibility for violations of LOAC that they incite, such as placing enemy prisoners of war in a place of risk from lynching by an angry mob.[173] Military leaders have a duty to take "necessary and reasonable measures" to ensure their forces do not commit LOAC violations.[174] If they do not take such measures they are answerable for the acts of omission–actions not performed that are required under international law, such as failure to properly supervise and control subordinates, and to ensure that they do not perpetrate war crimes. This type of inaction may be charged as a dereliction of duty.[175]

Officers are also liable for LOAC violations committed by subordinates pursuant to manifestly illegal orders they have passed on to those subordinates.[176] "Within certain limitations, [subordinate soldiers have] the right to assume that the orders of his superiors and the State which he serves and which are issued to him are in conformity with international law."[177] In military targeting, the legal analysis for a particular strike already has been made by superiors or it is already reduced to a check on the part of the pilot or soldier, for example, to confirm that the target is indeed the expected

171. Additional Protocol I, *supra* note 29, art. 86 (failure to act); *Delalić*, *supra* note 140, ¶ 313.

172. Additional Protocol I, *supra* note 29, art. 86 (failure to act); Trial of Lieutenant-General Shigeru Sawada and Three Others, U.S. Military Commission, Shanghai, Feb. 27–Apr. 15, 1946, 5 LAW REPORTS OF TRIALS OF WAR CRIMINALS 1 (1948).

173. DOD LAW OF WAR MANUAL *supra* note 28, § 18.23.2. *See also* Trial of Erich Heyer and Six Others (The Essen Lynching Case), British Military Court, Dec. 18–22, 1945, 1 LAW REPORTS OF TRIALS OF WAR CRIMINALS 88, 89–90 (1947); BANTAKAS, *supra* note 142, at 53–56 (2002).

174 DOD LAW OF WAR MANUAL *supra* note 28, § 18.23.3.

175. United States v. Lieutenant Colonel Jeffrey R. Chessani (Mar. 7, 2009), https://www.jag.navy.mil/courts/documents/archive/2009/Chessani,%20J.R.%20200800299%20unpub.pdf (unreported opinion of the U.S. Navy-Marine Corps Court of Military Appeals upholding the military judge's dismissal of the charges due to unlawful command influence). *See also* Ellen Knickmeyer, *In Haditha, Memories of a Massacre Iraqi Townspeople Describe Slaying of 24 Civilians by Marines in Nov. 19 Incident*, WASHINGTON POST (May 27, 2006), https://www.washingtonpost.com/archive/politics/2006/05/27/in-haditha-memories-of-a-massacre-span-classbankheadiraqi-townspeople-describe-slaying-of-24-civilians-by-marines-in-nov-19-incidentspan/2c18d37f-071a-46e1-a0c2-30bbbcb0ba5f/.

176. DOD LAW OF WAR MANUAL *supra* note 28, § 18.3.2.1; United States v. von Leeb (The High Command Case), 11 TRIALS OF WAR CRIMINALS BEFORE THE NUERNBERG MILITARY TRIBUNALS UNDER CONTROL COUNCIL LAW NO. 10, at 509, 510–11 (1950).

177. *Id.* at 511.

building.[178] Individual pilots and soldiers are not making in-depth or complex legal analysis, which is reserved for higher level echelons. The commander cannot be criminally liable for mere errors of judgment, and is only accountable for an order that is "criminal on its face."[179] Subordinate members of the armed forces who carry out the orders are also criminally culpable if the orders were manifestly illegal ("execute all the prisoners").[180] Subordinate soldiers may presume the lawfulness of their orders and are not held responsible unless such acts are so evidently unlawful or evil as to prevent any reasonable mistake of their legality.[181] A manifestly unlawful order is one in which a "man of ordinary sense and understanding" would, under the circumstances, know it to be unlawful.[182]

The legal doctrine of command responsibility extends to actions committed by the forces under the commander's "effective control," which means that there exists a superior-subordinate relationship.[183] Such a relationship requires that the superior have more than general influence over the subordinates, but must have the material ability to prevent or punish the commission of the crimes. Merely being "tasked with coordination does not necessarily mean to have command and control."[184] Lesser degrees of control, such as the ability to exercise substantial influence over forces that committed the crimes, is insufficient to establish command responsibility.[185]

"Effective command and control" and "effective authority and control," are synonymous.[186] The Statute of the International Criminal Court includes

178. Merel A.C. Ekelhof, *Lifting the Fog of Targeting: "Autonomous Weapons" and Human Control Through the Lens of Military Targeting*, 71 NAVAL WAR COLLEGE REVIEW 1, 24–25 (2018).

179. *von Leeb and Others*, *supra* note 176, at 511.

180. DINSTEIN, *supra* note 168, at 22.

181. This position was adopted in the Leipzig trials after World War I. It has persisted in contemporary legal doctrine. *Id.* at 26–35.

182. United States v. Calley, 48 C.M.R. 19, 27 (1973).

183. Rome Statute of the International Criminal Court, , *supra* note 124, art. 28; Prosecutor v. Halilović, Case No. IT-01-48-T, Judgment, ¶ 39 (Int'l Crim. Trib. for the former Yugoslavia Nov. 16, 2005), https://www.icty.org/x/cases/halilovic/tjug/en/tcj051116e.pdf; COMMENTARY ON THE ADDITIONAL PROTOCOLS *supra* note 78, ¶ 3544.

184. *Halilović*, *supra* note 183, ¶ 367.

185. Prosecutor v. Bemba Gombo, Case No. ICC-01/05-01/08, Judgment Pursuant to Article 74 of the Statute, ¶ 183 (Mar. 21, 2016), https://www.icc-cpi.int/CourtRecords/CR2016_02238.PDF [hereinafter *Gombo Judgment*].

186. Prosecutor v. Bemba Gombo, Case No. ICC-01/05-01/08, Decision Pursuant to Article 61(7)(a) and (b) of the Rome Statute, ¶ 412 (June 15, 2009), https://www.icc-

both terms.[187] Indicators of effective control are more a matter of evidence than substantive law.[188] Evidence demonstrates whether a commander had the "material ability" or power to prevent offenses and punish their perpetrators.[189] Indicia of effective control include the commander's de jure or de facto authority to issue orders, especially ordering troops into combat, whether his or her orders were actually followed, whether materiel and human resources were at his or her discretion, and whether he or she held authority to enforce discipline.[190] In short, the vicarious criminal liability that flows from command responsibility, implicates the commander in many of the acts of commission or omission that violate LOAC that are committed by subordinate forces. These forces may include AWS in a mixture of distributed, lethal capabilities on the future battlefield. Even then, command responsibility will persist as a subset of overall command accountability.

VI. CONCLUSION

The commander is accountable for battlefield action regardless of whether subordinates made and compounded errors, machines performed unexpectedly, or an incident arises as an unforeseeable consequence of pure happenstance or the fog of war. The military doctrine of command accountability may not seem to everyone to be "fair" in that the commander is accountable for every decision made across the armed forces enterprise and prosecution of the war effort, including decisions he or she did not make but nonetheless must answer for. The commander's direct, individual accountability covers every aspect of the outcome of specific decisions made by subordinate leaders and service members, failures of intelligence and mission analysis, mistakes made by government and private sector civilians accompanying the

---

cpi.int/pages/record.aspx?uri=699541. In considering the terms "effective command and control" or "effective authority and control," the Court found that the additional words "command" and "authority" had no substantial effect on the required level or standard of "control," since the two terms "effective" and "control" were used as a common denominator in both. *Gombo*, Judgment, *supra* note 185, ¶ 180.

187. Rome Statute of the International Criminal Court, *supra* note 124, art. 28.

188. Prosecutor v. Perišić, Case No. IT-04-81-A, Judgment, ¶¶ 87–88 (Int'l Crim. Trib. for the former Yugoslavia Feb. 28, 2013), https://www.icty.org/x/cases/perisic/acjug/en/130228_judgement.pdf.

189. *Id.* ¶ 88 ("In addition, the ability to prevent a crime is not necessarily a prerequisite to proving effective control."); *Prlić*, *supra* note 140, ¶ 244; Prosecutor v. Nizeyimana, Case No. ICTR-00-55C-A, Judgment, ¶ 342 (Sept 29, 2014), https://unictr.irmct.org/en/cases/ictr-00-55c.

190. *Prlić*, *supra* note 140, ¶ 244.

force, and malperformance of weapons. Ultimately, the military commander is accountable for the totality of the employment of forces under his or her command, from a handgun to a nuclear missile. In this regard, the commander faces criminal, non-judicial and administrative accountability. The commander's individual, direct accountability for virtually every line of effort in prosecuting the war is a strict liability regime of accountability that may (or may not) involve criminal sanction. While the commander's accountability may include legal exposure to criminal violations of the law of war, in military doctrine its reach is much farther, encompassing non-judicial and even non-legal mechanisms. The commander's accountability is separate and distinct from the related legal doctrine in international criminal law of command responsibility, in which the commander may face legal jeopardy for failure to exercise control over forces under command that violate LOAC.

Commanders authorize lethal force against enemy forces and lawful targets based upon their rules of engagement and subject to LOAC. These orders are informed by the commander's understanding of the tactical situation, training and experience, and the combination of tactics and weapons (methods and means). In all cases, the commander is accountable for the employment of the weapon. In the case of AI, commanders are accountable for calibrating how AWS are employed, how they will be able to "express their autonomy," and designating the parameters or "guardrails" for their operation.[191] If an autonomous system acts beyond its programmed limitations, the military system holds commanders accountable for failing to anticipate or guard against the danger. Commanders are empowered to deploy weapons and they are accountable if those machines mis-perform. Commanders are accountable to their superiors in the chain of command for the methods and means of warfare that they set in motion, from missiles that cannot be recovered in flight to artillery rounds that have left the tube, and to AWS, which may be equipped to determine targets based on programmed criteria. The commander's accountability inures to forces that fire errant or misguided rounds, weapons that fail to perform as expected, and mistakes made throughout the kill chain, and employs weapon systems with autonomous functions. This accountability includes criminal and administrative responsibility, in which commanders and combatants bear personal exposure or liability for the weapons they unleash, and are subject to sanction for violations of the law of war. The pursuit of advancements in weapon systems

191. Marcus Schulzke, *Autonomous Weapons and Distributed Responsibility*, 26 PHILOSOPHY & TECHNOLOGY 203, 217 (2013).

to ensure an effective, efficient, and more humane approach to warfare has been successful because it is coupled with the culture of accountability in leadership on the battlefield.