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Introduction

Legal reviews of new weapons, including new technologies of warfare, are a critical measure for States to ensure . . . that [its] armed forces are capable of conducting hostilities in accordance with its international obligations, and that new weapons are not employed prematurely under conditions in which respect for IHL cannot be guaranteed.

— International Committee of the Red Cross[1]

1.1 Emerging Military Technologies and Weapons Reviews

The history of humankind is, alas, a history of wars. Out of the 3,400 years of recorded history, only 250 (or 7.4 per cent of the total time) have been blessed with general peace.[2] No wars are fought without weapons. Whether in a state of war or ceasefire, the development and sophistication of weapons has been unremitting, with the global arms trade being a nearly US$100-billion-a-year business.[3] The constant development of weapons and defence technology not only reflects the self-perpetuating arms race in which humankind is caught, but also – by expanding the options available to belligerents – changes the ways in which wars are fought. The emergence of offensive cyber capabilities, expansion of intelligent robotic systems,

[1] International Committee of the Red Cross, 'International Humanitarian Law and the Challenges of Contemporary Armed Conflicts: Document Prepared by the International Committee of the Red Cross for the 32nd International Conference of the Red Cross and Red Crescent, Geneva, Switzerland, 8–10 December 2015' (2015) 97(900) *International Review of the Red Cross* 1427, 1472.

[2] International Committee of the Red Cross, 'The ICRC and Disarmament' (1978) 18(203) *International Review for the Red Cross* 90, 90.

[3] The Stockholm International Peace Research Institute (SIPRI), generally accepted as the most authoritative source on qualitative and quantitative information on international arms transfers, estimated the total value of the global arms trade in 2017 as at least US$95 billion: *Financial Value of the Global Arms Trade*, SIPRI www.sipri.org/databases/financial-value-global-arms-trade.

reliance on directed energy weapons and bio- and nanotechnology enhancements incorporated or assimilated into the human body, are just a few examples of what is currently being used or developed by States for battlefield deployment.

Over the last century and a half, however, continuous attempts have been made to limit the use or possession of weaponry through the development and codification of the modern law of armed conflict (LOAC). As a result, under treaty and customary LOAC – comprising both international humanitarian law (IHL) and arms control law – some weapons are prohibited altogether[4] and others subjected to restrictions on their use.[5] Although efforts taken to regulate weapons on the international level so far are commendable, they are not sufficient. The lion's share of States' arsenals is not subject to specific regulations but is governed by rules of general character, such as the prohibition on inherently indiscriminate weapons and weapons of a nature to cause superfluous injury or unnecessary suffering.[6] These rules are abstract. For them to fulfil their function in the face of the ever-increasing pace of scientific advance, States need to review new weapons on the national level for their compliance with international law, as required by Article 36 of the 1977 Additional Protocol I to the Geneva Conventions (AP I).[7] This provision states that:

> In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.

[4] For example, chemical and biological weapons, see *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction*, opened for signature 13 January 1993, 1974 UNTS 45 (entered into force 29 April 1997) (*Chemical Weapons Convention*); *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, opened for signature 10 April 1972, 1015 UNTS 163 (entered into force 26 March 1975) (*BWC*); also landmines under the Mine-Ban Treaty, see *Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction*, signed 18 September 1997, 2056 UNTS 211 (entered into force 1 March 1999) (*Ottawa Convention*).

[5] For example, landmines under 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 (and Protocols) (As Amended on 21 December 2001)*, adopted 10 October 1980, 1342 UNTS 137 (entered into force 2 December 1983) (*CCW*).

[6] See also Chapter 5.5.

[7] *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)*, opened for signature 8 June 1977, 1125 UNTS 3 (entered into force 7 December 1978) (*AP I*).

Article 36 thus forms a critical measure for ensuring respect for LOAC: it commands that no new military capability be used by a State which is inherently unlawful or cannot be employed lawfully in at least certain circumstances.

Regrettably, Article 36 has been marked by poor implementation. While the review processes adopted by some States have been outlined in the legal commentary to varying extents,[8] it seems reasonable to assume that the majority of States do not have weapons review mechanisms in place. At the date of writing, AP I conventionally binds 174 States Parties, with three other States being signatories.[9] Thus, twenty-two States are yet to become bound by the Protocol.[10] In 2006, the International Committee of the Red Cross (ICRC) reported that only nine States had confirmed to it as having national mechanisms to review the legality of weapons.[11] These States are: Australia, Belgium, Germany,

[8] The most comprehensive accounts produced so far concern the review processes in the USA and the United Kingdom: see W Hays Parks, 'Conventional Weapons and Weapons Reviews' (2005) 8 *Yearbook of International Humanitarian Law* 55, 109–35; William H Boothby, 'The Law of Weaponry – Is It Adequate?' in Michael N Schmitt and Jelena Pejic (eds), *International Law and Armed Conflict: Exploring the Faultlines* (Martinus Nijhoff, 2007) 297, 301–11. For the most recent brief account of the review processes in Belgium, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the USA, see Vincent Boulanin and Maaike Verbruggen, *SIPRI Compendium on Article 36 Reviews* (December 2017) SIPRI https://www.sipri.org/publications/2017/sipri-background-papers/sipri-compendium-article-36-reviews For an earlier discussion of Australia, the Netherlands, Norway, Sweden, Belgium, the USA and the United Kingdom, see James D Fry, 'Contextualized Legal Reviews for the Methods and Means of Warfare: Cave Combat and International Humanitarian Law' (2005) 44 *Columbia Journal of Transnational Law* 453, 473–79. For another look at Sweden, the USA, Norway and Australia, see Isabelle Daoust, Robin Coupland and Rikke Ishoey, 'New Wars, New Weapons? The Obligation of States to Assess the Legality of Means and Methods of Warfare' (2002) 84(846) *International Review of the Red Cross* 345, 354–61.

[9] *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)*, United Nations Treaty Collection https://treaties.un.org/Pages/showDetails.aspx?objid=08000002800f3586.

[10] Andorra, Azerbaijan, Bhutan, Eritrea, India, Indonesia, Iran (signatory), Israel, Kiribati, Malaysia, Marshall Islands, Myanmar, Nepal, Pakistan (signatory), Papua New Guinea, Singapore, Somalia, Sri Lanka, Thailand, Turkey, Tuvalu and USA (signatory).

[11] International Committee of the Red Cross, 'A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977' (2006) 88(864) *International Review of the Red Cross* 931, 934 (*ICRC Guide*). At the time of writing, the ICRC Guide is in the process of being updated: see 'Legal Review of New Weapons: Scope of the Obligation and Best Practices' on International Committee of the Red Cross, *Humanitarian Law & Policy* (6 October 2016) https://blogs.icrc.org/law-and-policy/2016/10/06/legal-review-new-weapons/ quoting Dr Gilles Giacca, Legal Advisor at the ICRC.

France, the Netherlands, Norway, Sweden, the USA and the United Kingdom.[12] Expert commentary suggests it is unlikely that the numbers have changed significantly since. Some of the most recent estimates presume that between fifteen to twenty States carry out weapons reviews, with many others possibly relying on the reviews conducted by other States.[13]

My research has found that at least twenty States have (or have officially confirmed to have) weapons review processes in place. In addition to the States listed by the ICRC, they include States where I have personally conducted interviews with Article 36 authorities, namely, Austria, Canada, New Zealand and Switzerland.[14] In the context of discussing regulation of the Explosive Remnants of War (ERW) under the auspices of *Convention on Certain Conventional Weapons* (CCW),[15] a number of other States have indicated that they respect the requirements of Article 36: Argentina, Denmark and Mexico.[16] Further, in the course of deliberations on

[12] *ICRC Guide*, n 11, 934 n 8.

[13] See Netta Goussac, 'Safety Net or Tangled Web: Legal Reviews of AI in Weapons and War-Fighting' on International Committee of the Red Cross, *Humanitarian Law & Policy* (18 April 2019) https://blogs.icrc.org/law-and-policy/2019/04/18/safety-net-tangled-web-legal-reviews-ai-weapons-war-fighting/. See also 'Legal Review of New Weapons', n 11, quoting Dr Gilles Giacca, Legal Advisor at the ICRC; *Strengthening of the Review Mechanisms of a New Weapon, Means or Methods of Warfare – Working Paper Drafted by Argentina*, 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, UN Doc CCW/GGE.1/2018/WP.2 (4 April 2018) (*Working Paper Drafted by Argentina*).

[14] See Section 1.4.

[15] *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*, opened for signature 10 October 1980, 1342 UNTS 137 (entered into force 2 December 1983) (*CCW*).

[16] For Denmark: *Working Group on Explosive Remnants of War, Responses to Document CCW/GGE/X/WG.1/WP.2, Entitled IHL and ERW, Dated 8 March 2005 – Response from Denmark*, Group of Governmental Experts of the States 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, UN Doc CCW/GGE/XI/WG.1/WP.18 (17 August 2005). Note that in 2018, Denmark released its national regulation on weapons reviews into the public domain. See Ministry of Defence, *Cirkulære om folkeretlig vurdering i forbindelse med udforskning, udvikling, erhvervelse eller valget af et nyt våben og af metoder eller midler i krigsførelse* [Service Regulation on the International Legal Evaluation in Connection to the Study, Development, Acquisition, or Adoption of a New Weapon, Means, or Method of Warfare], CIR1H nr 9494 (29 May 2018) https://www.retsinformation.dk/eli/retsinfo/2018/9494 (*Danish Directive*). For Argentina: *Working Group on Explosive Remnants of War, Responses to Document CCW/GGE/X/WG.1/WP.2, Entitled IHL and ERW, Dated 8 March 2005 – Reply from the Argentine Republic*, Group of Governmental Experts of the States 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

regulating autonomous weapon systems (AWS)[17] within the framework of the CCW, Russia, Italy and Finland asserted that they comply with Article 36.[18] In 2016, in the same setting, Israel for the first time publicly presented its approach to weapons reviews.[19] This constitutes yet another example of a State not party to AP I performing legal reviews of weapons. In the same context, however, other States have taken a sceptical or outright negative stance on Article 36 reviews generally,[20] or their usefulness with regard to AWS in particular.[21] This scepticism towards the utility of domestic legal

Indiscriminate Effects, UN Doc CCW/GGE/XI/WG.1/WP.10 (2 August 2005). For Mexico: the document is in the possession of the author. See also Timothy LH McCormack, Paramdeep B Mtharu and Sarah Finnin, *Report on States Parties' Responses to the Questionnaire: International Humanitarian Law and Explosive Remnants of War* (Asia Pacific Centre for Military Law, 2006).

[17] Note that the official mandate of the GGE is to examine 'emerging technologies in the area of lethal autonomous weapon systems (LAWS)'. The current study, however, proceeds on the understanding that lethality is not a defining feature of any weapon system, because a capability designed to cause a less-than-lethal injury is still a weapon/means of warfare in the sense of Article 36 and, regardless of its design intent, may well have a lethal effect: see Chapter 4.1.

[18] See *Potential Opportunities and Limitations of Military Uses of Lethal Autonomous Weapons Systems – Submitted by the Russian Federation*, 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, UN Doc CCW/GGE.1/2019/WP.1 (15 March 2019) [8]–[9]. For a scholarly inquiry into Russia's compliance with Article 36, see Bakhtiyar Tuzmukhamedov, 'Legal Reviews of New Weapons: Process and Procedures' in Baldwin De Vidts and Gian Luca Beruto (eds), *Weapons and the International Rule of Law: 39th Round Table on Current Issues of International Humanitarian Law (Sanremo, 8th–10th September 2016)* (Franco Angeli, 2017) 66–73. For Italy, see *Statement by Ambassador Gianfranco Incarnato, Permanent Representative of Italy to the Conference on Disarmament – General Exchange of Views* (9–13 April 2018) https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_(2018)/2018_LAWSGeneralExchange_Italy.pdf. For Finland: *Statement by Finland*, CCW on LAWS, Third Session (25 March 2019) [audio recording] https://conf.unog.ch/digitalrecordings/.

[19] Maya Yaron, *Statement on Lethal Autonomous Weapons Systems (LAWS)* (13 April 2016) https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Informal_Meeting_of_Experts_(2016)/2016_LAWS_%2BMX_ChallengestoIHL_Statements_Israel.pdf.

[20] For example, India: see Josephine Roele, *CCW Report: From Killer Robots to Incendiary Weapons: the CCW Preparatory Committee Previews Issues for the Fifth Review Conference* (2 September 2016) Reaching Critical Will https://www.reachingcriticalwill.org/disarmament-fora/ccw/2016/prepcom/ccwreport/11147-ccw-report-from-killer-robots-to-incendiary-weapons-the-ccw-preparatory-committee-previews-issues-for-the-fifth-review-conference.

[21] For example, China and Brazil: see James Farrant and Christopher M Ford, 'Autonomous Weapons and Weapon Reviews: The UK Second International Weapon Review Forum' (2017) 93 *International Law Studies* 389. See also Report of the 2016 Informal Meeting of Experts, noting that 'it was asserted by some delegations that there was limited value to

review mechanisms further supports the assumption that the number of States currently conducting weapons reviews is likely to be low.

Only time will show whether the group of States voicing doubts about the capacity of national Article 36 processes to deal with the unconventional nature of new weapons technologies will grow or, conversely, diminish in size. It must be emphasised, however, that the discussions within the CCW increasingly accentuate the importance of Article 36 reviews. In fact, the provision's role in ensuring AWS are developed within the confines of law is so frequently referenced, that a lay participant at the CCW meetings of governmental experts might easily gain the impression that weapons reviews are conscientiously conducted by the majority of States partaking in the negotiations.[22]

1.2 Cyber Capabilities, Autonomous Weapon Systems, Autonomy and Artificial Intelligence

In contrast to a rather slow growth of the Article 36 compliance rate, the pace of technological progress is accelerating. In particular, Artificial Intelligence (AI) has made great strides over the past several decades and is increasingly exploited by States to their benefit. Broadly speaking, AI is viewed as a logical progression in computer science and represents machines' ability to imitate human intelligence.[23] Having said this, there is still no clarity on how exactly to conceptualise AI and the debate on the topic continues unabated decades after the term was coined at a Dartmouth conference in the summer of 1956.[24] The world's leading military powers are developing and adopting AI applications for a range of functions, including in the fields of command and control, intelligence collection and analysis, logistics, navigation and administration, to name

[Article 36] processes in the absence of common standards at the international level': see *Advanced Version: Report of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS) – Submitted by the Chairperson of the Informal Meeting of Experts* [50] https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Informal_Meeting_of_Experts_(2016)/ReportLAWS_2016_AdvancedVersion.pdf.

[22] This conclusion is based on personal observation of the GGE meetings between 25 and 29 March 2019, which I attended in person representing UNSW Canberra. For full audio recordings of this session, see *Digital Recordings Portal*, United Nations https://conf.unog.ch/digitalrecordings/

[23] For more detail, see Chapter 8.2.

[24] On AI definition, see Jacob Roberts, *Thinking Machines: The Search for Artificial Intelligence* (14 July 2016) Science History Institute https://www.sciencehistory.org/distillations/thinking-machines-the-search-for-artificial-intelligence

just a few.[25] The key outcome of AI innovations is, however, claimed to be the remarkable progress in autonomy in weapon systems, which fundamentally changes the way armed forces project their power.[26]

The incentives for increasing levels of weapons' autonomy are strong from both operational and humanitarian perspectives. Some of the key advantages lie in the possibility of deploying military force at a lesser cost but with greater speed, agility, precision, persistence, reach, coordination and mass, while keeping humans out of the dangers associated with active combat.[27] Humanitarian benefits of autonomy are foremost associated with improving the accuracy of weapon systems – autonomy provides an opportunity to apply force in a more discriminating manner, furthering compliance with the applicable legal requirements in the context of rapidly shifting operational conditions.[28] At the same time, the prospect of fielding 'autonomous' or 'AI-enabled'[29] 'killer robots' has attracted much public attention in recent years and a steadily growing civil society movement – accentuating the perceived risks of such technology – is enthusiastically driving the debate on its possible future regulation.[30] What is hardly mentioned in this context, however, is that it is the cyber domain which has witnessed the most significant advancements in military autonomy and AI-enabled capabilities.[31] Indeed, as Healey observes, it is cyberspace where the first 'autonomous weapon with an algorithm, not a human hand, pulling the trigger' was deployed as long as

[25] See 'Artificial Intelligence and Offensive Cyber Weapons' (2019) 25(10) *Strategic Comments* x.

[26] See also Vincent Boulanin and Maaike Verbruggen, *Article 36 Reviews: Dealing with the Challenges Posed by Emerging Technologies* (December 2017) SIPRI 17 https://www.sipri.org/sites/default/files/2017-12/article_36_report_1712.pdf

[27] Paul D Scharre, 'The Opportunity and Challenge of Autonomous Systems' in Andrew P Williams and Paul D Scharre (eds), *Autonomous Systems: Issues for Defense Policymakers* (NATO Headquarters Supreme Allied Commander Transformation, 2015) 3, 9 www.act.nato.int/images/stories/media/capdev/capdev_02.pdf.

[28] Natalia Jevglevskaja and Rain Liivoja, 'The Better Instincts of Humanity: Humanitarian Arguments in Defense of International Arms Control' in Jai Galliott, Jens David Ohlin and Duncan Macintosh (eds), *Lethal Autonomous Weapons* (Oxford University Press, 2021) 103–20.

[29] For the discussion of the concepts of 'autonomy' and 'AI', see Chapter 8.2.

[30] For more detail, see Chapter 8 and also Natalia Jevglevskaja and Rain Liivoja, *Balancing the Lopsided Debate on Autonomous Weapon Systems* (20 December 2019) Australian Strategic Policy Institute www.aspistrategist.org.au/balancing-the-lopsided-debate-on-autonomous-weapon-systems/.

[31] See Rain Liivoja, Maarja Naagel and Ann Väljataga, 'Autonomous Cyber Capabilities under International Law' (NATO Cooperative Cyber Defence Centre of Excellence Working Paper, 2019) 12 https://ccdcoe.org/library/publications/autonomous-cyber-capabilities-under-international-law/.

a decade ago.[32] Given that many States regard cyber capabilities as tools aiming to support kinetic operations, it is also believed that it is the cyber domain where AI-enabled algorithmic technology is likely to proliferate with greater success in the future; it does not appear to undermine prevailing operational concepts and organisational structures and is therefore less likely to be met with institutional resistance.[33]

Indeed, cyberspace has been largely recognised as a new domain of warfare, and modern-day militaries see it as their duty to defend and operate within it. According to some sources, more than 100 States had established military and intelligence cyber-warfare units by 2015, and there is no reason to believe this number has since dropped.[34] Some leading military powers have admitted to possessing and employing offensive cyber capabilities, although the absence of unclassified data precludes any certain conclusions as to their nature of operation or numbers.[35] In comparison to traditional weaponry, cyber capabilities (including those underpinned by AI) are claimed to have low development, operational and maintenance costs, can generally be deployed rapidly (even though certain operations may require extended periods of preparation lasting weeks or months) and have unparalleled versatility in that they can be used across the full range of military operations, from engagement to large-scale and high-intensity warfare.[36]

[32] Jason Healey, *Stuxnet and the Dawn of Algorithmic Warfare* (16 April 2013) Huffington Post www.huffpost.com/entry/stuxnet-cyberwarfare_b_3091274.

[33] See 'Artificial Intelligence and Offensive Cyber Weapons', n 25.

[34] Fergus Hanson, *Waging War in Peacetime: Cyber Attacks and International Norms* (20 October 2015) Lowy Institute www.lowyinstitute.org/the-interpreter/waging-war-peacetime-cyber-attacks-and-international-norms. According to another estimate, about 140 States have developed or are in the process of developing the capacity to wage cyber warfare: see Kevin Coleman, *Coleman: The Cyber Arms Race Has Begun* (28 January 2008) CSO https://www.csoonline.com/article/2122353/coleman–the-cyber-arms-race-has-begun.html

[35] Dan Sabbagh, 'Britain Has Offensive Cyberwar Capability, Top General Admits', *The Guardian* (online), 26 September 2020 https://www.theguardian.com/technology/2020/sep/25/britain-has-offensive-cyberwar-capability-top-general-admits Josh Gold, 'The Five Eyes and Offensive Cyber Capabilities: Building a "Cyber Deterrence Initiative"' (NATO Cooperative Cyber Defence Centre of Excellence Working Paper, 2020) https://ccdcoe.org/library/publications/the-five-eyes-and-offensive-cyber-capabilities-building-a-cyber-deterrence-initiative/ Julia Voo et al., *National Cyber Power Index 2020* (September 2020) Belfer Center 16 www.belfercenter.org/publication/national-cyber-power-index-2020.

[36] Maren Leed, *Offensive Cyber Capabilities at the Operational Level* (2013) Center for Strategic & International Studies 1 https://www.csis.org/analysis/offensive-cyber-capabilities-operational-level But see also George I Seffers, *Speed of Cyber Is Not Always in Milliseconds* (1 October 2018) Signal www.afcea.org/content/speed-cyber-not-always-milliseconds; Conrad Prince, *On the Offensive: The UK's New Cyber Force* (23 November 2020) RUSI https://rusieurope.eu/commentary/offensive-uk-new-cyber-force

The inevitable question arising from the rapid assimilation of technological advancements by the armed forces is whether the law can keep up with such developments. The issue of 'exactly how' international law governs the employment of (AI-enabled) cyber capabilities and AWS has been the subject of heated multilateral debates for many years. The interconnection between autonomy and cyber notwithstanding,[37] the intergovernmental discussions have taken place in separate forums, with State conduct in the cyber domain being considered by the United Nations Group of Governmental Experts (UN GGE) and the Open-Ended Working Group (OEWG), while the issue of AWS has been the focus of the Group of Governmental Experts meeting under the auspices of the Convention on Certain Conventional Weapons (CCW GGE).[38] Remarkably, while the latter debate is about a decade younger, it is generally agreed that LOAC (including the obligation under Article 36 of AP I) applies fully to the development and deployment of AWS. In contrast, a number of governments participating in the UN GGE and OEWG continue to reject the idea of LOAC's applicability to State activities in the cyberspace, in spite of the steady expansion of their military cyber arsenals. Having said this, and although both subject matters have attracted intense scholastic attention, the issue of international law implications of the development and fielding of AWS is yet to be met by concerted efforts akin to the expert commentary on the legality of State operations in the cyber domain, namely, the 2013 *Tallinn Manual 1.0* and the 2017 *Tallinn Manual 2.0*.[39] The prospect of devising and adopting any tailor-made regulations on AWS or State cyber operations in the near future remains rather low, amplifying the need for a more rigorous implementation of Article 36.

1.3 Purpose and Scope

Understanding the extent of the weapons review obligation as well as the challenges that new technology poses for the reviewing authorities is a necessary precondition for its successful implementation. This book offers analysis of both these matters. It focuses on the scope of the weapons review obligation and attempts to bring some coherence to a diverse range

[37] Broadly speaking, cyber capabilities are developed for operations in the cyber domain, while AWS are designed to operate in the physical environment. However, both types of capabilities are software driven and pose a similar set of challenges for the Article 36 review mechanisms: see Chapters 8 and 9.
[38] For more detail, see Chapters 8.1 and 9.1.
[39] See also Liivoja, Naagel and Väljataga, n 31, 5.

of views on the individual elements of the provision. It also examines the role of Article 36 in ensuring that the use of emerging military technology is consistent with international law. It was primarily motivated by the absence of a comprehensive and systemic analysis in the legal scholarship of the extent of the weapons review obligation, as well as its relationship with other compliance mechanisms in the Protocol, particularly the duty of States under Article 82 to provide for legal advisers to military commanders. This discussion is timely: States' interpretative choices will determine not only the range of emerging military capabilities subject to review, but also when and how the reviews will be initiated and conducted. Moreover, the unconventional nature of new weapons technologies, as exemplified by cyber capabilities and AWS, poses unprecedented technical and legal challenges to national weapons review mechanisms. It is also likely to entirely merge the boundaries between Articles 36 and 82 of AP I.

Throughout the book I argue that Article 36 is sufficiently broad to cover a wide range of emerging military technology and offers States the necessary flexibility to adopt a process that best suits their organisational demands. However, the provision has its limits, which are shaped and defined by the interpretative decisions made by States: as long as the notion of 'attack' under LOAC is construed narrowly, certain cyber capabilities will fall outside the review requirement regardless of the devastating consequences they may produce. I also argue that, in the absence of a corresponding obligation under customary international law (CIL) to conduct legal reviews of weapons, conscientious implementation of Article 36 offers an essential safeguard for effective compliance with LOAC. The provision also sends a clear signal that law should not simply follow technological developments, but rather steer them. Where emerging military capabilities fail to adhere to existing legal standards – for example, capacity of AWS and cyber capabilities to be employed in keeping with the fundamental LOAC principles of distinction and proportionality – an Article 36 review serves to identify these issues. Where new technologies challenge extant legal provisions – for example, whether the concept of attack under AP I extends to the destruction of data – the law will only change if States see the need for such change. Without thorough weapons reviews this need might remain unappreciated.

It is hoped that this study may serve as a comprehensive guide on potential implementation strategies for States willing to establish an Article 36 process and, for those States with a review process already in place, a suggestion on how it might be updated or revised. It is also hoped that eventually, by raising awareness of the timeliness and expediency of