

# The utility of weapons reviews in addressing concerns raised by autonomous weapon systems

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The obligation to legally review weapons systems has been identified by the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems (GGE on LAWS) as one of its Guiding Principles. Despite calls to share practical measures and processes to undertake this review, national practice remains opaque and fragmented. Identifying existing commonalities in weapon review processes and adjusting them to account for the autonomous functionality incorporated into new weapons design and development will be a critical requirement for ensuring compliance of autonomous weapons systems (AWS) with existing legal requirements, demonstrating the suitability of existing law to regulate the use of this novel technology in warfare.

## Weapons review helps ensure lawful employment of AWS

States that are party to Additional Protocol I to the Geneva Conventions are obliged, as a result of the weapon review requirement articulated in Article 36, to ensure that all weapons, means and methods of warfare comply with that State's international legal obligations. In addition to this particular obligation, States must ensure that they comply with their international legal obligations generally, which necessitates a level of review of weapon systems for compliance with international humanitarian law obligations.

In addition to identifying that weapons review is a 'useful tool'



in enabling IHL compliance in the use of LAWS, one of the 11 Guiding Principles agreed by the GGE on LAWS included the need to share best practices in how this review might be achieved.

There has been, to date, no public sharing of best practices, nor articulation by States as to how LAWS might be reviewed to ensure compliance with IHL. Despite forming part of the agreed 11 Guiding Principles of the GGE the weapon review process has not been universally accepted as solving the concerns raised about the use of LAWS more generally; although some States consider that by following this existing international legal obligation, the question of further regulation of AWS is less acute, as the weapons systems cannot be deployed if they do not confirm with extant IHL obligations.

Article 36 weapons review processes provide guidance as to how a weapon, means or method of warfare can be employed, or what restrictions or limitations must be put in place by the fielding State to enable its use in compliance with that States' international legal obligations. Applying this same approach to AWS will enable States to employ these systems with legal obligations in mind.

### **Existing state practice in weapons review is ad hoc, untransparent but a number of commonalities can be identified**

The Article 36 weapons review process is not widely practiced by States, nor is the practice required to be transparent. For reasons such as secrecy about States' military capabilities, the process which States follow to undertake the review process are not widely published. However, taking into account the necessary considerations to enable compliance with the particular requirements of Article 36, and having regard to State practice that is public, as well as leading influences in this area such as the ICRC Guide on the Conduct of Weapons Review, a number of commonalities in the approach to weapons review processes can be identified. These commonalities can be broken down into a number of steps, which include:

- Confirming application of the review obligation by ascertaining if the system is a 'new weapon, means or method of warfare.'
- Determining whether the type of weapon is specifically prohibited or restricted by treaty or customary law binding the reviewing State.
- Whether there are any general international law prohibitions applicable to the system.
- In some cases, considering consideration of national policy (and the Martens clause) in utilising the system.

### **Existing weapons review practice requires adjustment to account for AWS**

Having regard to these steps and available State practice in the request of weapons, means and methods of warfare, certain adjustments will be required to take account of the unique nature of systems with autonomous functionality.

In addition to state practice being inconsistent and opaque, a number of other challenges are presented by AWS that will necessarily impact the manner in which the weapon review process is undertaken. Some of the critical challenges include:

- Whether the temporal scope of the review is sufficient, having regard to the impact of machine learning, adjustment of AI

- algorithms, or a change in the input data of the AWS.
- Those capabilities that have the machine undertake any IHL activity that a human may previously have undertaken will require special attention to confirm the translation of human performance at the requisite legal standard is capable of completion by computer code.
- Identification of a suitable mechanism for human control (and thus accountability for use of) the capability.

The ability to address some of these key challenges requires earlier intervention in the conduct of weapons review processes, specifically during the development and design phases, than is reflected in currently known State practice. A broader, iterative and multidisciplinary approach is likely necessary to meet these compliance challenges, and the sharing of best practices to achieve these will necessarily assist States in adopting adjusted processes to account for the novel issues raised by AI being resident in machines that are subsuming IHL functions that were previously the preserve of humans.

### **The outcomes of weapons review for AWS can enable their lawful use**

Military and civilian infrastructure are not easily separated. They operate using at least some of the same infrastructure, relying on the same cables, systems, and electromagnetic spectrum. In addition, the speed at which operations against digital infrastructure can occur increases the difficulty of complying with the obligation – particularly if such operations involve a degree of automation or the use of artificial intelligence (AI).

The obligation to “avoid locating military objectives within or near densely populated areas,” (Article 58(b)) was drafted with military assets, such as tanks and military personnel, front of mind. However, there is nothing inherent in the wording of the provision that would exclude its application to less tangible objects, such as a crowded computer networks or radio-frequencies. The objective of the provision is to prevent bad consequences for civilians by limiting the placement of military objectives near them.

### **Case studies demonstrate that the weapons review process for AWS provide benefit for legal compliance and more efficient system design**

The application of a the common steps required of a weapons review to case studies can be used to further illustrate how a State may have to adjust extant processes to account for autonomy in weapon systems development and design. Critically, the use case studies identified the criticality of properly articulating the use case for the autonomous capability, which extends to accounting for the anticipated operating environment and data inputs and outputs, to be capable of demonstrating a State's legal compliance in fielding the weapon system.

The paper, 'The Utility of Weapons Reviews in Addressing Concerns Raised by Autonomous Weapons Systems, identifies how weapon review of AWS', using different capability types in the case studies, will present different challenges to a State undertaking the weapon review of an AWS. These case studies reinforce the need to share weapon review practices for States to respond to these challenges in a meaningful way that can further enhance other States' accountability by leveraging the learning and experiences of each State in responding to these emerging technologies. For example, the identification of the issues associated with a decision support tool that is designed to learn

from its previous outputs is quite different to those identified when dealing with a system where the autonomy directly drives a lethal effect. Further, similar capabilities may utilize autonomy differently, which will result in different legal limitations following review. For example, an autonomously driven ground vehicle with a defensive weapon that requires human interaction to discharge the weapon will present fairly simple legal challenges; whereas that same platform with autonomy also controlling the defensive weapon will have compounded legal issues relating to the autonomous capability of the system.

### Concluding observations

Weapons reviews of AWS have clear utility in assessing the compliance of these novel systems with a State's current international legal obligations. The ability to identify how the system is intended to be used, as well as limiting the contexts in which an AWS may be fielded, is a critical outcome of such a process. This is particularly important given the assumption of functions by machines that were previously undertaken by human operators.

There remain challenges in articulating compliance of an AWS with legal standards in terms of translating the subjective and objective legal tests required to enable lawful use of lethal force in armed conflict – which is inherently a complex, unpredictable and congested environment. However, such an exercise is perhaps the only way to ensure the lawful use of these systems in future conflict. Sharing the lessons learned from conducting these reviews will enhance the principles of the CCW; as well as States' understanding on the limitations of these systems and broader compliance requirements when commissioning novel technologies incorporating autonomy. States sharing their practices in overcoming these challenges – as envisaged in the 11 Guiding Principles of the GGE – will further IHL compliance for technological capabilities States are designing and developing now, or have indicated they intend to acquire in the future; but will have a broader compliance effect in shaping international practice of IHL for novel and emerging technology.



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