

**Webinar series on emerging technologies
in the area of lethal autonomous weapons systems
Legal Aspects – 28 October 2020**

In October 2020, the United Nations Institute for Disarmament Research and United Nations Office for Disarmament Affairs convened three webinars to inform the ongoing deliberations of the group of governmental experts on emerging technologies in the area of lethal autonomous weapons systems (the GGE on LAWS). The webinars considered relevant technological, military, and legal aspects that would benefit from additional clarification or review.

The third webinar addressed legal aspects of LAWS. It was convened virtually by the United Nations Institute for Disarmament Research on 28 October 2020.

Summary of the webinar on legal aspects

The GGE on LAWS has identified several areas of convergence on legal aspects related to emerging technologies in the area of LAWS, which are largely reflected into the Guiding Principles adopted by the Group in 2019. They confirm that international humanitarian law (IHL) applies to new weapons, including emerging technologies in the area of LAWS, and that responsibility should rest on humans and cannot be delegated to machines. The Group has also encountered points of divergence regarding the sufficiency of existing IHL to address the challenges raised by such technology. Finally, the GGE on LAWS has identified the need to further explore and clarify the implications of these technologies for the implementation and application of IHL, notably in the conduct of hostilities.

During the webinar, five experts were invited to share their views and knowledge on the following areas : i) the human element; ii) ethical considerations and the Martens clause; iii) the practical implementation of IHL during the conduct of hostilities; iv) responsibility and accountability, and, above all, v) the regulation of autonomy in warfare. Panelists were asked to address these specific issues from a practical and concrete angle, keeping in mind the mandate of the GGE on LAWS and its efforts to provide consensus recommendations on aspects of a normative and operational framework. The following section summarizes the interventions of each expert.

Prof. Bakhtiyar Tuzmukhamedov, International Law Professor and Vice-President of the Russian International Law Association, addressed the regulation of autonomy in warfare. He first noted that the Martens clause doesn't bear any normative content and has to be translated into specific, predictable, comprehensive and comprehensible treaty provisions. Regarding the definition and categorization of LAWS, including the distinction between automated, semi-autonomous and autonomous systems, Prof. Tuzmukhamedov contended that the very question to be addressed relates to the identification of the threshold of complete removal of human input in the decision to take another human being's life. Approaching this question from an IHL perspective requires compliance with the fundamental principles of proportionality, distinction, precautions, and necessity. This can be challenging in a fast-paced combat environment with many complex emerging target opportunities.

Prof. Tuzmukhamedov highlighted the risks of unauthorized acquisition of such systems, the risks of uncontrolled proliferation, and the possible erosion of responsibility and accountability for criminal and other wrongful acts. He also noted that uncertainty was possible regarding the determination of deliberate retaliatory strikes against legitimate targets (*ratione personae* and *ratione loci*) in cases LAWS are deployed.

Prof. Tuzmukhamedov further stressed that the complexity of the legal environment—including public international law, IHL, human rights law, and domestic law—calls for the involvement of legal advisors in the planning and execution phase of operations involving LAWS.

Prof. Tuzmukhamedov noted that means and methods of warfare regulated by Protocols to the Convention on Certain Conventional Weapons (CCW) have always been built upon technical details and characteristics. By contrast, experts have not agreed on the exact characteristics of LAWS, which makes Prof. Tuzmukhamedov doubtful of the viability of negotiating a legally binding instrument in the absence of a sufficiently detailed common definition of such weapons. He also noted that a comprehensive ban or even a system-based regulation would be difficult to develop and implement, due to the wide variety of possible iterations that such weapon systems could take. He opined that at, at this stage, non-binding arrangements such as guidelines or guiding principles that could reflect a basic initial common understanding of LAWS, their components and methods of use would be more practical. Such non-binding arrangements could be further developed as States gain further knowledge about LAWS and their characteristics. Prof. Tuzmukhamedov also referred to the development of non-proliferation and export control measures, including end user certificates, as possible ways forward.

Ms. Netta Goussac, Associate Senior Researcher, SIPRI, addressed the legal basis of human control in the use of force. Considering weapons that have autonomy or are able to select and apply force autonomously, without human intervention, Ms. Goussac described a variety of questions and challenges relevant for the application of IHL. She stressed that while these weapons are not regulated explicitly, they must be used in full compliance with IHL deriving from both treaty law and customary law, including the fundamental principles of distinction, proportionality and precaution. She emphasized that IHL obligations in the use of LAWS are applied to human beings who decide to use the system to perform an attack, not to the system itself. Considering that the choice of the means and methods of warfare is part of the planning and conduct of military operations, Ms. Goussac noted that due to their unique characteristics, LAWS could pose challenges for the ability of their users to comply with IHL. Some decisions related to the use of force are indeed made long in advance of the physical application of force, at a time when the exact target, location or timing of the use of force may still be unknown.

Building on these observations, Ms. Goussac highlighted three main challenges ahead. First, the “numbers” challenge stems from IHL requirements of evaluative judgements that are not easily quantifiable (e.g. incidental civilian harm, reasonable certainty or anticipated military advantage), while pre-programmed, LAWS rely only on objective elements such as target profiles and data collected by sensors. Second, the “context” challenge of making context-based decisions related to the use of LAWS considering the circumstances ruling at the time of an attack. While LAWS could be pre-programmed with constraints to limit, for instance, the type of targets that they can engage, other circumstances may vary over time during an attack. It is unclear whether those individuals making an ex-ante decision to deploy LAWS would be able to reasonably foresee the varying circumstances between the programming and the activation phase, as well as between the activation and the actual use of force. Ms. Goussac stressed that the variability of circumstances in time may affect the legality of any decision to use LAWS, as the assumptions that existed at the moment of the activation of the system might not be valid throughout the operation of the system. Third, IHL requires commanders to operate on the basis of the predictability of both the weapon they intend to use and their environment of use, to anticipate and limit the effects of those weapons. The duration of the operation and the characteristics of the operational environment, among other factors, will affect the ability of commanders to predict the effects of deploying LAWS, and will thus have a direct bearing on their ability to comply with IHL.

Ms. Goussac then outlined two approaches to overcome these challenges. A technology-oriented approach, on the one hand, focuses on the design and development of sophisticated weapons capable of executing complex tasks, leaving human decision-makers and operators with the responsibility to take all feasible precautions during the attack. A context-based judgement approach, on the other hand, stresses that IHL requires comprehensive context-based judgement performed by a human being. Ms. Goussac noted that the two approaches share the principle that the human user conducting an attack through a LAWS must always

take measures to exert control over the parameters of use, the environment, and through an interaction with the machine.

Ms. Goussac noted that it would probably be easier to respect IHL when targeting military objects by nature. She stressed that limiting measures may be helpful but not sufficient to ensure compliance with IHL in targeting other objectives that are not inherently military in nature. She stressed that, while a weapon system may be able to assist a human make the value-based contextual judgements required for compliance with IHL, it could not replace the human in this regard and it could also hinder this process in some circumstances.

She further noted that human-machine interaction should be envisaged as taking place throughout the entire life cycle of a weapon system, from initial design and development to operational use and post-use evaluation and should be examined during the legal review process.

Dr. Thompson Chengeta, Researcher, University of Southampton, warned against overemphasizing the importance the GGE on LAWS reaching the common position that IHL applies to LAWS, as this position was never in dispute. He stressed that the focus should remain on the original question raised in 2013 regarding the sufficiency and adequacy of IHL to govern emerging technologies in the area of LAWS, and the possible shortcomings of existing international and domestic legal frameworks. Dr. Chengeta noted that recent GGE on LAWS discussions on the “operationalization” of the Guiding Principles adopted in 2019; should not overlook the fact that operationalizing an inadequate framework would fail to resolve the challenges raised by LAWS, including ethical concerns.

According to Dr. Chengeta, there is no convincing counterargument to the assertion that LAWS technology creates a *lacuna* or gap in existing law, especially on morality, ethics, human dignity and diffusion of moral responsibility. He underlined that the question of LAWS goes beyond discussions on the applicability of and compliance with IHL to encompass questions of the ethical acceptability of these systems and whether such systems could be used in conformity with human values. Allowing a machine to perform acts, in the conduct of hostilities, that have traditionally been reserved for human combatants falls outside what IHL can adequately address. Therefore, he stressed that whether machines can perform better than humans in the conduct of hostilities is not relevant, as the question to be answered concerns the ethical acceptability of developing such systems in the first place.

He stressed that while rigorous legal reviews are often considered as a potential measure to address such concerns, they are not sufficient to address or account for the challenges posed by LAWS if such technologies, by their nature, create a gap in existing legal regimes. Dr. Chengeta further noted that States are reluctant to share information on the consideration of the Martens clause in the conduct of weapons reviews and agreed with by Prof. Tuzmukhamedov that, in order to be effective, the Martens clause needs to be translated into predictable and comprehensible legal instruments. He argued that the notion of public conscience—which encompasses moral and ethical considerations and differs from public opinion—could be interpreted based on positions that are not unanimous in international fora and, in particular, the UN. Given that decisions within the GGE on LAWS and, more broadly, the CCW, are taken by consensus, the emergence of the notion of human control could be seen as an indicator of “public conscience”. Acknowledging the potential difficulty of operationalizing such a notion, Dr. Chengeta argued that a new legally binding instrument should be created around the notion of human control, encompassing broad aspects of public conscience and ethical norms.

Prof. Rain Liivoja, University of Queensland, addressed the practical application of IHL in the conduct of hostilities regarding the use of LAWS—understood as system that, once activated, can select and engage targets without further human intervention—Prof. Liivoja posited that the distinctions between “automated”, “autonomous”, “semi-autonomous”, and “lethal” or “non-lethal” weapons were of little relevance. Rather, the important question is the level and nature of autonomy. IHL implementation will depend on the capabilities of the system and the nature of the judgement made, whether evaluative or not. Framing the use of LAWS as an act of replacing the human with a machine that exhibits human-like qualities and is capable of applying the rules and principles of IHL would unduly anthropomorphize such

machines. The fundamental question is whether States and human beings can fully comply with IHL in making decisions on the use of LAWS for the application of force.

Dr. Liivoja stressed that the legal principle of distinction is not about whether a LAWS can reliably distinguish between military and civilian objects, but rather whether the user has sufficient certainty that only the objects that would legally qualify as military objectives will be targeted—an assessment that is based on the conditions, circumstances and environment of deployment. Prof. Liivoja explained that the principle of proportionality, on the other hand, requires an evaluative judgement and therefore a subjective decision. He noted the tendency to call for subjectivity in the application of IHL in this case, while objectivity is otherwise the rule. A possible solution would be to only deploy LAWS in situations where the risk of incidental harm to civilians would be very unlikely—for instance, in sparse maritime environments, or in uninhabited areas. Another option would be for humans to determine the maximum level of incidental civilian damage that would be acceptable with respect to specific targets. In current military operations, rules of engagement may already limit the ability for low-ranking soldiers to make decisions about the use of force and the acceptable level of incidental harm to civilian persons and objects, even in circumstances where it would be permissible under IHL; such decisions are made at a higher level of the chain of command. It is therefore not unreasonable to think that a system could be designed to seek a human input in the case it calculates potential incidental harms to civilians that would exceed the implemented threshold.

Prof. Liivoja stressed that precautionary measures are subject to a feasibility standard that allows a degree of flexibility depending on the means and methods of warfare used. A LAWS might be able to implement certain precautionary measures such as issuing warnings. Prof. Liivoja nevertheless stressed that the human operator would still bear ultimately responsibility for the effects of the engagement, hence the possible need to limit the operating time of the LAWS to minimize unintentional harm. Furthermore, the decision to choose between an autonomous system and another system may in itself be a precautionary measure; depending on the circumstances, using a LAWS may theoretically be a means to limit collateral damage. Prof. Liivoja insisted that autonomous weapons should not be compared to human soldiers, but that the comparison should rather be about a human user employing an autonomous weapon system versus a human user using a non-automated weapon system.

According to Prof. Liivoja, decisions on the legal use of LAWS should take into consideration technological, environmental (boxed autonomy) and human-machine interaction constraints. States or human decisionmakers can only delegate decisions on the use of force to a system if they have reasonable certainty that it would result in compliance with IHL. This requires a certain degree of confidence in the system, which, as in any other weapon system, can never reach 100%. This also raises the question of risk and human trust in the system, and the possibility of over-reliance or under-reliance on the technology. He concluded that while IHL requires a certain level of human-machine interaction, it is difficult to pre-determine in exact this obligation as it will depend on the type of weapon, the type of constraints and the intended use and environment.

Prof. XinYu Leng, School of Law, China University of Political Science & Law, noted that the issue of accountability for breaches of IHL from the use of a weapon system has been rarely discussed in international jurisprudence. In the Gotovina case before the International Criminal Tribunal for the Former Yugoslavia (ICTY), found human beings responsible, as the attack was the result of a human judgement. According to Prof. Leng, the *actus reus*, the causal link and the *mens rea* are fundamental points to examine when discussing responsibility in the framework of the possible use of LAWS.

Prof. Leng stressed that a human who is out-of-the-loop could not predict the behavior of a weapon system at the moment of the attack. Meanwhile, when using a human-in-the-loop or human-on-the-loop system, the risk of communication loss is always present. He therefore argued that there is no possibility to establish the *actus reus* and the causal link, nor any applicable standard or criteria to assess the *mens rea* regarding the human-machine interaction. He also stressed that applying command responsibility or the concept of joint criminal enterprise to such human-machine interaction would not be satisfactory, as such legal standards require human to human relationships, and thus cannot be applied to the relationship between

humans and machines. The latter will depend on the command and control as well as the communication links, the reliability of sensors and, more broadly, the whole system. According to Prof. Leng, the only clear-cut situation would be the deliberate use of a LAWS to commit a war crime. Situations in which a LAWS would operate beyond human control are not covered under the current international framework. Prof. Leng described three hypothetical scenarios to illustrate these considerations. In the first situation, LAWS are used to launch an attack that aligns perfectly with the prediction, intention and control of a human decisionmaker. In the second situation, LAWS are used to launch an attack that is in alignment with the prediction and intention but not under the control of a human being. In both situations, responsibility can be established if the conditions of a war crime are met: the conjunction of *actus reus* and *mens rea*. In a third situation, where the attack is unpredictable, unintentional and the LAWS out of the control of a human being, no responsibility could be attributed under current criminal international law. Prof. Leng added that responsibility of designers and manufacturers is not currently addressed under international law but could be present in certain domestic legal frameworks, notably as a criminal offence involving recklessness or the willful delivery of a system that would not be usable in compliance with IHL. He also noted that attributing State responsibility for the use of LAWS would be quite difficult, since an intention to knowingly use such a system to contravene international law would need to be proven. Prof. Leng proposed that traceability and transparency regarding the steps of computation of a weapon system could be a solution to ensure responsibility, though he noted that such steps face a challenge of understandability—the “black box dilemma”—as well as the technical challenge of testing these characteristics of weapon systems.

Panelists concluded that the operationalization of the Guiding Principles adopted in 2019 could benefit from the identification of internationally recognized best practices, including existing weapons control mechanisms, in order to help achieve a proper contextualization of the legal issues related to LAWS. Panelists also highlighted the challenge of answering questions related to evaluative judgements (reasonable certainty, for instance) and the need to agree on a legal standard of human control that fully accounts for existing law and ethics. Finally, panelists commended the important contribution of the GGE on LAWS in highlighting the significance of weapons reviews.

Mr. Ljupčo Jivan Gjorgjinski, Chair of the GGE on LAWS, noted that the question of IHL’s sufficiency to address challenges posed by LAWS was an agenda item of the GGE, most recently in 2019. He underlined the importance of the complementary processes that have been undertaken by various actors and the need to include the technology sector in future discussions. He stressed that the growing complexity of the work of the GGE on LAWS reflects the need to fully understand the technology and the applicable legal framework to address the risks of LAWS. The Chair assessed that the conduct of weapons reviews and the consideration of the entire life cycle of the weapons were also important elements to address these issues. He concluded that achieving a comprehensive consideration of these aspects as well as building an optimal discussion environment could lead to constructive decisions in the near future.