Group of Governmental Experts on Emerging Technologies
in the Area of Lethal Autonomous Weapons System
Geneva, 4-8 March and 26-30 August 2024

Compilation of replies received to the Chair’s guiding questions

Submitted by the Chairperson

1. This non-paper was compiled by the Implementation Support Unit of the Convention on Certain Conventional Weapons (CCW) at the request of the Chair of the Group of Governmental Experts (GGE) on emerging technologies in the area of LAWS, to facilitate discussions of the Group. The non-paper consists of the responses provided to the Chair’s guiding questions, listed in Annex 1 of his letter dated 16 February 2024 in preparation for the first session of the GGE on LAWS in 2024.

2. The compilation includes responses received until 11:00 am on 1 March 2024, submitted by the following High Contracting Parties to the CCW: Australia, Brazil, Bulgaria, Estonia, Finland, France, Germany, Japan, Luxembourg, Republic of Korea, Russian Federation, State of Palestine, Switzerland, United States of America. It also includes other responses received, from two groups of States (Costa Rica, Colombia, Dominican Republic, Ecuador, El Salvador, Kazakhstan, Nigeria, Panama, Peru, Philippines, Siera Leone, State of Palestine, and Uruguay; and Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Kazakhstan, Mexico, Nicaragua, Pakistan, Palestine, Panama, Peru, Philippines, Uruguay, and Venezuela). The responses have been reproduced as received.
I. Characterization and definitions

Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS”.

Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?

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| Australia  | Australia does not consider it necessary or productive for the GGE to search for an exhaustive definition of what constitutes an emerging technology in the area of LAWS. We favour a functional approach to referring to LAWS, focusing on how autonomy is used. A technology agnostic approach is also preferable since almost any current or future weapon system could conceivably be endowed with autonomous functions. The 2023 LAWS GGE report concluded that “the characterization of weapon systems based on emerging technologies in the area of LAWS should take into consideration the possible future development of those technologies” (para 20).
Consistent with this approach, the proposal ‘Draft articles on autonomous weapon systems – prohibitions and other regulatory measures on the basis of international humanitarian law (IHL)’ (‘Draft Articles’), which Australia co-sponsored, defines, for the purposes of the draft articles and without prejudice to any other understandings, autonomous weapon systems as “those weapon systems that, once activated, can identify, select, and engage targets with lethal force without further intervention by an operator”.
We do not consider it helpful to distinguish ‘partially autonomous’ and ‘fully autonomous’ weapon systems as a basis for determining lawfulness. This is because autonomy exists on a spectrum and is not necessarily correlated with compliance with international humanitarian law (IHL). Further, autonomy is not static. A weapon system can incorporate different degrees of autonomy in different functionalities and autonomy can be dialled up or down in different circumstances of use. |
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| Brazil     | Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS”
Emerging technologies in the area of Autonomous Weapons Systems (AWS) refer to advancements in military technologies that enable weapon systems to select and engage targets without human intervention. These technologies primarily rely on artificial intelligence (AI), sensors and robotics to make decisions that were traditionally made by human operators.
The categorization of a technology as “emerging” in the context of AWS does not solely depend on its novelty but also on its application within autonomous weapon systems and its potential impact on warfare, ethics, and international security. The development and deployment of these technologies raise significant questions regarding compliance with international law, underscoring the need for rules to ensure that their use aligns with international law and ethical standards.
Over the last five years, the deliberations held by the Group of Governmental Experts (GGE) of the CCW have amassed an extensive and diverse array of insights and information concerning the characteristics of AWS, especially as the debate has increasingly focused on addressing challenges to international law. This rich trove of contributions has traditionally focused on three key technological domains:
1. Artificial Intelligence and Machine Learning: AI and ML are at the heart of AWS, enabling systems to process information, make decisions, and execute actions based on learned or programmed criteria. The development of sophisticated software and algorithms is essential for the operation of AWS, encompassing navigation, target recognition and engagement. |
2. Robotics: Robotics technology provides the physical platform for AWS, allowing for the mobility, manipulation, and physical execution of tasks. This includes unmanned aerial vehicles (UAVs), unmanned ground vehicles (UGVs), and unmanned underwater vehicles (UUVs), among others.

3. Sensor Technologies: sensors and detection systems are critical for AWS, enabling them to perceive their environment, identify targets, and make engagement decisions. These technologies include, but are not limited to, radar, lidar, infrared, and acoustic sensors, which can detect and classify targets based on AI and ML parameters.

Despite the numerous contributions addressing characteristics in various sessions GGE, it is crucial to acknowledge that centering discussions primarily on characteristics and definitions can introduce conceptual ambiguities and practical dilemmas. This focus complicates the advancement of international negotiations and the crafting of coherent policy frameworks.

A emphasis on characteristics often results in debates that are mired in technicalities and hypothetical scenarios, which could detract the Group from addressing the core issues of human control, accountability, and compliance with international law.

Acknowledging the diversity of views on the characteristics of AWS highlights the formidable challenge of achieving consensus on precise, universally accepted definitions. The range of perspectives, emanating from various national policies, contributions to international discussions, and authoritative insights from entities like the International Committee of the Red Cross (ICRC), indeed showcase the complexities of the dialogue around AWS.

The ICRC's AWS definition, which centers on the ability of systems to autonomously select and engage targets, provides a critical point of reference that underscores the humanitarian concerns linked with these weapons.

Brazil's positions have consistently highlighted the importance of concentrating the debate on the use of AWS and its functions rather than on its characteristics. By focusing on the potential use, discussions can more effectively address the ethical, legal, and operational implications of autonomous weapons.

This functional approach allows for a more pragmatic examination of how these systems are used in practice and the potential risks they pose to compliance with international law, in particular international humanitarian law and principles of humanity and dignity.

Through its contributions to the CCW GGE, Brazil has provided examples of how specific functions of AWS, such as autonomous target identification and engagement, raise significant concerns regarding accountability, predictability, and the ability to make contextually informed decisions. By examining these functions, stakeholders can identify clear criteria for human control, develop practical safeguards, and establish frameworks that uphold human dignity and international law.

Furthermore, focusing on the functioning facilitates a more inclusive and constructive dialogue among states with varying technological capabilities and perspectives. It allows for the development of common ground, where countries can agree on the essential principles governing the use of AWS, such as ensuring human control and accountability, regardless of the system’s characteristics.

The absence of a common, consensual set of characteristics for AWS is not detrimental to the development of international regulatory instruments; rather, it aligns well with the challenges these systems present.
This situation mirrors the approach taken with previous arms control efforts, such as the CCW Protocol on blinding laser weapons. The protocol focused on the humanitarian impact and use of the weapons rather than attempting to define their technical specifications in exhaustive detail. This precedent shows that a regulatory framework can be effectively developed by emphasizing the functions and effects of the weapons systems rather than their specific characteristics.

Such an approach is particularly suited to the dynamic and evolving nature of AWS, ensuring that international norms and regulations remain relevant and adaptable to future technological advancements.

Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?

Autonomy in AWS can be described as the degree to which a system can perform critical functions—such as target selection and engagement—without human intervention, based on its programming, sensors, and algorithms. Autonomy, thus, is not a binary attribute but a spectrum, where the level of human control varies depending on the function and context of use.

Moreover, some AWS are designed with machine learning capabilities that allow them to adapt their actions based on new data acquired during operations. This new aspect of autonomy raises significant ethical and legal concerns regarding predictability and accountability.

The discussion around autonomy is nuanced, recognizing that not all autonomous functions raise the same level of concern. It is crucial to understand these functions within the framework of human control, as emphasized by Brazil’s position in the GGE discussions on AWS.

Discussions on autonomous functions should prioritize those aspects that pose significant challenges to compliance with international law, particularly in terms of ensuring accountability, maintaining human dignity, and adhering to the principles of distinction, proportionality and precaution. While navigation and mission adaptation are also integral to the capabilities of AWS, they are not central to the core of the debate.

The crucial autonomous functions to consider are those directly involved in the decision-making process related to the use of lethal force, which are:

1. Target Selection: The autonomous capability to identify and select targets without human intervention. This function raises significant legal and ethical questions, particularly concerning the system’s ability to distinguish between combatants and non-combatants in accordance with the principle of distinction.

2. Target Engagement: The subsequent step of autonomously deciding to engage a selected target with lethal force. This function is critical to the debate as it directly impacts the principle of proportionality and precaution, which require all feasible efforts to be made to avoid civilian harm, and not just reducing probabilities to acceptable standards.

Indeed, the element of “constant care” is integral to the principle of precaution, setting legal boundaries on the autonomous functions of AWS, particularly with regards to the use of force without human validation.

Therefore, the emphasis in the GGE discussions should be placed on the importance of maintaining meaningful human control over these specific targeting functions. This approach is grounded in the recognition that autonomy in the use of force could also present challenges in compliance with the principles of IHL, as indicated in the next questions.
The focus is thus on ensuring that autonomy in AWS is limited in a manner that ensures compliance with international law, highlighting the need for a clear demarcation between ineffective human oversight and meaningful human control vis-a-vis critical decision-making processes involving the use of force. The aim is to ensure that autonomous functions in AWS are employed in a manner that ensures compliance with international law, respects human dignity, and ensures accountability.

Bulgaria

Please provide a concrete explanation or characterization of what is considered an “emerging technologies in the area of LAWS”:

Emerging technologies in the area of LAWS represent weapons systems that operate on their own, when set in motion, and have the ability to independently implement certain assignments/tasks, more specifically identification, selection, interception and application of force to a target without human involvement in the process.

Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?

Autonomy in weapons systems does not present a novelty for quite some time now. Autonomous functions in the critical target activities of identifying and Intercepting a certain objective, resolving to use force and applying it without human intervention during a mission are among the primary characteristics of weapons systems based on emerging technologies in the area of lethal autonomous weapons systems, which is of core interest to the Group.

Autonomy represents a relative concept, as its spectrum includes distinct dimensions/functions and degrees. The level of autonomy allows to differentiate between fully autonomous weapons systems and other lethal weapons systems featuring autonomy (or partially AWS).

Estonia

Please provide a concrete explanation or characterization of what is considered an emerging technology in the area of LAWS”

We deem as autonomous weapons system any weapons system that makes substantial decisions on use of force based on pre-programmed criteria and limitations, i.e. without concurrent human involvement. However, more problematic than a weapons system might be a system of systems that gathers and creates an ample amount of information on targets and situations based on which decisions are made. An example of a system of systems that gathers information on targets could be targeting softwares, which advise humans on engaging different targets based on algorithms. We recommend that system of systems are also taken into account when defining autonomous weapons systems in the future.

We would additionally like to emphasize that we do not feel comfortable expanding the discussions of the GGE to such autonomous systems that have no capabilities to cause serious injuries or death to humans. In this regard, the terms “lethal” and “weapon” in “lethal autonomous weapons systems” are of utmost importance. Although, the term “lethal” should, in our view, be interpreted more broadly, i.e. also encompassing injury, damage and destruction a weapon might cause. We are of the opinion that the work of the GGE should not focus on non-lethal autonomous systems, including but not limited to non-lethal unmanned aerial vehicles (UAVs), non-lethal unmanned ground vehicles (UGVs), drones without targeting capabilities etc. However, further analysis would be merited on whether the discussions should focus on loitering munition which assumes more and more autonomy.

Based on that explanation or characterization, what functions of LAWS would be „autonomous“? How could „autonomy“ be described or explained?
We see autonomy as a function-specific property. In different weapons systems and platforms, these functions or tasks may be subject to different degrees and types of human control. For example, an unmanned aerial combat vehicle might have significant autonomy in movement (including take-off, navigation and landing) but no autonomy in targeting. Autonomy relates to specific functions or tasks of weapons systems and platforms, and autonomy can have different levels with respect to each of those functions or tasks. As such, we think that the notion of a fully autonomous weapons system has limited utility. A clear distinction between semiautonomous and fully autonomous systems is difficult to make because systems exist on a spectrum of autonomy, even in relation to just one function.

The GGE operates within the framework of the CCW. As such, it seems entirely appropriate to focus on the increased autonomy in the critical functions of a weapons system that is detecting and engaging targets. As such, platforms that can move autonomously but rely entirely on a human operator for targeting decisions, should in our view fall outside of the discussions of the GGE. For the purposes of future discussions, we find it important to note that an autonomous weapons system may, in addition to a physically connected singular weapons system, also be a combination of sensors, weapons, command and control functions and the like that are physically separated from one another. These kinds of weapons systems undoubtedly pose additional challenges to international law that should be elaborated on in future discussions of the GGE.

**Finland**

**Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS”**

Emerging technology in the area of LAWS are weapon systems that once activated can identify, select, and engage targets with lethal force without further intervention by a human operator.

We would also like to note that there is no clear reason to exclude less-than-lethal weapons from the discussion – lethality is not a defining feature of any weapon system, autonomous or otherwise. An instrument that is intended to cause less-than-lethal injuries to persons, or harm to objects, is nonetheless a weapon. Also, a weapon intended to be less-than-lethal may well prove to be lethal in certain circumstances.

Remotely piloted and automated systems, as well as systems featuring autonomy in non-critical functions, should be excluded.

**Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could autonomy be described or explained?**

Autonomy should be understood as a capability to perform the given task(s) in a self-sufficient and self-governing manner. This includes the freedom of self-planning in the tasks and required subtasks. The programming and control structures behind AI systems are fundamentally about task execution.

Autonomy is not an on/off feature, so instead of “autonomous systems” it would be better to use the expression “systems having autonomous features or functions”.

The cooperative working paper from 2018 submitted together with Estonia *Categorizing lethal autonomous weapons systems – A technical and legal perspective to understanding LAWS* is still valid and contains a comprehensive characterization of our understanding of AI based machine autonomy and the differences between automation, autonomy and independence.

**France**

**Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS”**
Weapons systems based on emerging technology in the area of LAWS are weapons systems that, once activated, are able to identify, select, track, and apply force to targets, without further human intervention. Thus, weapons systems based on emerging technology in the area of LAWS excludes the following weapons systems:

- remotely piloted and tele-operated systems;
- automated systems and systems featuring autonomy in “non-critical”/“low-level” functions (such as altitude hold, observation, camouflage);
- “non-lethal” systems featuring autonomy.

*Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?*

A weapon system may be characterized as autonomous if it can, through the use of sensors, computers and algorithms, perform the critical functions of selecting and engaging to apply force against targets without intervention by a human operator or without permanent human involvement or control.

The integration of autonomy in weapons systems can and will be *gradual*, ranging from “partially” autonomous to “fully” autonomous. With regard to LAWS:

- “Fully” lethal autonomous weapons systems are systems capable of acting without any form of human supervision or outside of a chain of command and control by setting their own objectives or by modifying, without any human validation, their initial programming or their mission framework.
- “Partially” lethal autonomous weapons systems are lethal weapons systems integrating autonomy. Those systems can be defined as lethal weapons systems featuring decision-making autonomy in critical functions such as identification, classification, interception and engagement to which, after assessing the situation and under their responsibility, the military command can assign the computation and execution of tasks related to critical functions within a specific framework of action. Such a system cannot compute lethal decisions that would modify its field of operation and include technical safeguards or intrinsic characteristics to prevent failures misuse and relinquishment by the command of two vital duties, namely situation assessment and reporting.

*Germany*

Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS”

In general, all areas of technologies regardless if dual-use or military developed that enable a system to fulfill its pre-designed functions autonomously. These technologies are:

- Artificial intelligence,
- Data (Big Data) and Computing (e.g. cloud-computing)
- Autonomy
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<td><strong>Specifically, a weapon system with autonomous functions enabled by the use of EDTs incapable of being used in accordance with international law, including International Humanitarian Law is considered a LAWS (Tier 1).</strong></td>
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<td>Autonomy is generally associated with self-governance or self-determination. Autonomy can relate to an entire system, but autonomy can also relate to certain functions in a system. In general, autonomy is absolute. Therefore, autonomy without further explanation is understood as full autonomy. Therefore, fully autonomous weapons systems or lethal weapons systems would perform complex actions, learn and – decisively - formulate new rules if necessary (without human validation). They would operate completely outside human control. By contrast, partially autonomous systems are not autonomous in the proper sense since their framework of action is determined by the human programmer. Their margin of scope of action is confined to the selection amongst different options of action pre-programmed, or at least – in cases of learning systems – set by the human operator.</td>
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<td><strong>Japan</strong> As we explain in “the Draft articles on autonomous weapon systems – prohibitions and other regulatory measures on the basis of international humanitarian law” submitted by Australia, Canada, Japan, the Republic of Korea, the United Kingdom, and the United States in 2023, we recognize that weapons systems with autonomous functions, including those that, once activated, can identify, select, and engage targets with lethal force without further intervention by an operator, to be of particular relevance when considering uses of weapons systems based on emerging technologies in the area of LAWS. Japan recognizes that IHL applies to all weapons systems and means of conflict and is independent of the content of the military technology used, and supports the need to take a “technology-neutral approach”. With respect to &quot;autonomy,&quot; defining a general threshold level of autonomy based on technical criteria alone could pose difficulty as autonomy is a spectrum. The understanding of this concept changes with shifts in the technological frontier, and different functions of a weapons system could have different degrees of autonomy. (2018 report ¶22c)</td>
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<td><strong>Luxembourg</strong> Luxembourg defines Autonomous Weapons Systems as “Weapon systems capable of identifying, selecting and deploying force against a target without human intervention.” Considering, that autonomous weapon systems may be used to lethal and non-lethal ends, it is Luxembourg’s position that the term “lethal” should not be included in the definition. In the framework of the GGE LAWS, Luxembourg will however continue to refer to Lethal Autonomous Weapons systems, in compliance with the mandate. Based on the explanation above, the functions of a LAWS that would be autonomous would be the detection and identification of a target, its selection as well as the deployment of force against it. In describing autonomy, the basic concepts underlying autonomy should be defined, namely adaptability, human control, and the objective of deployment. Most salient among the latter is the concept of adaptability, enabled by artificial intelligence, which is part of the characterization of LAWS and the ethical and legal debates in this domain. Adaptability refers to the ability of a LAWS to autonomously observe an unknown environment, orient itself in it, decide on an action and act on the latter. However, the degree of autonomy is difficult to quantify. For this reason, Luxembourg believes that it is more effective to define the degree of human intervention, rather than attempting to quantify the degree of autonomy.</td>
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Republic of Korea | - Please provide a concrete explanation or characterization of what is considered an “emerging technology in the area of LAWS.”

Technologies including novel advancements in the field of artificial intelligence that potentially enable novel and more sophisticated weapons with autonomous functions intended to have lethal consequences.

- Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?

Autonomous functions in this context would mean that once such a weapon system is activated, it will be able to identify, select and engage targets with lethal force without further intervention by an operator.

Russian Federation | There is no consensual definition of lethal autonomous weapons systems (LAWS) in the existing international law. This complicates our work within the Group of governmental experts of the High Contracting Parties to the Convention on certain conventional weapons (CCW) related to emerging technologies in the area of LAWS. Elaboration of a common working understanding of lethal autonomous weapons systems is necessary for a clearer understanding of the subject of the discussions within the Group and further prospects of work.

The working definition should meet the following requirements:

a) it should contain the description of the types of weapons that fall under the category of LAWS, conditions for their production and testing as well as of their use;

b) it should not be limited to the existing understanding of LAWS, but also take into consideration the possibility of their future development;

c) it should be universal in terms of the understanding by the expert community, including scientists, engineers, technicians, military personnel, lawyers and ethicists;

d) it should not be construed as limiting technological progress and undermining the ongoing research in the field of peaceful robotics and artificial intelligence;

e) it should not define LAWS restrictively, through functions only.

It is necessary to avoid a division of the weapons under discussion into "bad" and "good" ones, in other words, allow the division of such weapons into groups based on the political preferences of a particular group of States.

We consider the following definition to be accurate: a lethal autonomous weapons system is a fully autonomous unmanned technical means other than ordnance that is intended for carrying out combat and support missions without any involvement of the operator. In this regard, we oppose to discuss the issue of unmanned aerial vehicles in the context of LAWS within the CCW framework, since they are a particular case of highly automated systems and are not classified as LAWS.

The existing highly automated military systems should not be separated into a "special" category requiring immediate restrictions and bans. It is this degree of automation that enables such systems to operate in dynamic combat situations and in various environments while ensuring an adequate level of discrimination and accuracy and, therefore, their compliance with international humanitarian law (IHL) principles and norms.
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<td>State of Palestine</td>
<td>Please refer to pages 2-3 of the State of Palestine’s Proposal for the Normative and Operational Framework on Autonomous Weapons Systems of 3 March 2023. In addition, we would like to add the following point: Lethality In our paper, we raise concerns regarding a broad range of autonomous weapons systems, not just 'lethal' ones. Restricting discussions to ‘lethal’ AWS is problematic for a number of reasons, including: 1. Autonomous weapons systems <strong>can be non-lethal but still unlawful</strong> based on international law, for example if designed to cause unnecessary suffering or superfluous injury to humans, short of death. 2. Autonomous weapons systems that use munitions that <strong>typically do not result in death, for example rubber bullets or tear gas</strong>, also pose legal, ethical, humanitarian and security risks. 3. International humanitarian law further <strong>protects civilian objects, such as hospitals and schools, against material damage</strong>. The use of autonomous weapons systems to target objects, may also have deadly and other adverse humanitarian consequences for persons in or near targeted objects or through reverberating effects. The CCW GGE has recognized that these systems should not fall outside the scope of regulations. 4. Determining whether an autonomous weapon system is 'lethal' or not, is practically challenging because <strong>lethality is an effect of an attack, not an inherent design feature of a weapon</strong>. A weapon system designed to target humans can be used in a way that does not result in death or other injury, while a weapon system designed to be non-lethal can result in fatalities and injuries, depending on the manner of use and the specific context. ‘Lethality’ is <strong>not a legal term</strong>, and delegations are likely to interpret it in different ways. The restriction on only considering 'lethal’ systems would <strong>undermine clarity over the subject matter</strong> that is needed going forward. 5. We note that a <strong>large number of States from different regions</strong> have spoken in favour of removing the 'lethal' restriction within discussions at the CCW GGE, and several States have detailed national policy positions dealing with autonomous weapons systems, not just 'lethal' ones.</td>
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<td>Switzerland</td>
<td>Switzerland considers AWS to be addressed in the context of the GGE as a generic term encompassing weapon systems that can operate without direct human intervention once activated, in the critical functions of target identification, target selection and the application of force thereto. We reiterate our conviction that the question of definition must not stop the formulation of elements of a future instrument. We are of the view that after more than ten years of considerations in the CCW there is now sufficient conceptual understanding on the matter at hand to simply refer to “Autonomous Weapons Systems” (AWS) rather than to “emerging technology in the area of LAWS”. In this context we also reiterate that, the CCW (taking into account its object and purpose) must not limit its considerations of AWS by tying it to the concept of lethality. Consideration of AWS should also include other types of attacks, insofar as they are relevant for the implementation of IHL [in particular the rules and principles regulating the conduct of hostilities]. Notably, IHL regulates attacks, that is acts of violence against the adversary, whether in offence or defence, and governs both attacks against objects or persons.</td>
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As the scope of a future instrument and its legal nature become more concrete, the characterization of AWS will become more specific, possibly culminating in a negotiated definition, as contained in some (though not all) arms control and disarmament treaties.

It also may be important to make a distinction regarding the quality and scope of autonomy/control when characterizing AWS. This may be necessary/useful when considering a future instrument on AWS built around a set of prohibitions and regulations as suggested in many proposals. In this respect, we note with interest that while a differentiation between fully and partially autonomous weapons have served to articulate this distinction, more and more proposals on the table now are differentiating between systems operating completely outside human control and a responsible chain of command, and other systems featuring autonomous capabilities in critical functions that would have sufficient control.

Please provide a concrete explanation or characterization of what is considered an "emerging technology in the area of LAWS."

The United States has understood the term “autonomous weapon systems” for the purposes of the draft articles proposal submitted by it and other States, and without prejudice to any other understandings of this or similar terms for other purposes, to include those weapon systems that, once activated, can identify, select, and engage targets with lethal force without further intervention by an operator. Although emerging technologies are not needed to enable a weapon system to, after activation, identify, select, and engage targets with lethal force without further intervention by an operator, a variety of emerging technologies could be used to enable a weapon system in this way. Such emerging technologies could include advancements in robotics that enable more sophisticated unmanned platforms, advancements in sensors that enable the system to perceive more aspects of the environment, including potential targets, and advancements in software that enable the system to identify, select, and engage targets with greater sophistication and accuracy. With regard to the latter category, emerging technologies in the area of lethal autonomous weapon systems may include novel advancements in the field of artificial intelligence. For example, such advancements can include those relating to self-learning (without externally-fed training data) and self-evolution (without human design inputs). (See 2018 GGE report 22c). It is important to recognize that novel advancements in the field of artificial intelligence, although relevant to the potential development of autonomous weapon systems, are relevant for many other purposes. In many cases, these novel advancements are being developed in the private and commercial sector for purposes unrelated to any military application.

Based on that explanation or characterization, what functions of LAWS would be “autonomous”? How could “autonomy” be described or explained?

The role and impacts of autonomous functions in the identification, selection or engagement of a target are among the essential characteristics of weapons systems based on emerging technologies in the area of lethal autonomous weapons systems. (2019 GGE report ¶19a) Whether or how an operator relies on these functions may also be relevant; for example, in our 2022 proposal on principles and good practices, it was noted that these principles and good practices may be of particular relevance when considering uses of weapons systems based on emerging technologies in the area of LAWS in which the system operator relies on autonomous functions to select and engage targets with lethal force and, before activation, the system operator does not identify a specific target or targets for intended engagement. “Autonomy” can be subject to different understandings, including depending on the context in which this term is used. In the context of weapon systems, “autonomy” can refer to the capability of the weapon system to perform various functions without human intervention. In the context of weapon systems, “autonomy” can also refer to the way in which the system is used, i.e., the operator relying on the system to perform those functions without the operator...
performing them. It is important to recognize that not all autonomous capabilities involve AI and not all AI-enabled capabilities are autonomous. It is important to appropriately distinguish between such capabilities and not use the terms interchangeably.

Application of IHL, including the relation of IHL with the concept of human control, judgment and/or involvement

Which elements/characteristics would make a LAWS incompatible with IHL?

Does compliance with IHL depend on the use of LAWS in a specific context and if so, in which manner?

Australia

The 2023 LAWS GGE report concluded that ‘weapon systems based on emerging technology in the area of LAWS must not be used if they are incapable of being used in compliance with IHL’ (para 21(b)). It also concluded that ‘control with regard to weapon systems based on emerging technologies in the area of LAWS is needed to uphold compliance with international law, in particular IHL, including the principles and requirements of distinction, proportionality and precautions in attack’ (para 21(c)).

As with all weapon systems, there are certain characteristics that would render LAWS inherently incapable of being used in compliance with IHL. For example, a LAWS would be incapable of being used in compliance with IHL if the system is inherently indiscriminate, because it cannot be directed at a specific military target or its effects limited as otherwise required by IHL; or of a nature to cause superfluous suffering or unnecessary suffering.

To prevent development and use of systems that cannot, under any circumstances, be used in compliance with IHL, Article 1 of the Draft Articles states that AWS must not be designed to: (a) target civilians or civilian objects, or spread terror among the civilian population; (b) conduct engagements that would invariably result in incidental loss of civilian life, injury to civilians, and damage to civilian objects excessive in relation to the concrete and direct military advantage anticipated; or (c) conduct engagements that would not be the responsibility of the commanders and operators using the system.

Article 1(2) of the Draft Articles further states that autonomous weapons may only be developed such that their effects in attacks are capable of being anticipated and controlled as required in the circumstances of their use by the principles of distinction and proportionality. Articles 3 – 5 of the Draft Articles set out regulatory measures to ensure distinction and proportionality in conducting attacks and to ensure precautions in attacks.

The specific measures needed to anticipate and control the effects of a weapon system, to ensure compliance with IHL, will be highly context specific. An appropriate level of human involvement throughout the lifecycle of the weapon system is required. The degree of human direction or supervision, and types of human-machine interaction required, will vary depending on the capabilities and limitations of the weapon system, the operational context (including targets intended for engagement) and the environment of use.
The legality of the use of AWS is not determined by inherent features alone but significantly depends on their mode of use and functioning within specific contexts. This approach recognizes that the same technology may be used in compliance with IHL under certain conditions and violate it under others.

The principles of distinction, proportionality, and precaution are central to this assessment, with a particular emphasis on the aspect of constant care within the principle of precaution to ensure efforts are made to minimize harm to civilians.

Absence of meaningful human control would render a system inherently incompatible with IHL.

Meaningful human control is the mechanism embedded in the system that ensures that the human operator retain the ultimate decision-making power over the critical functions of autonomous weapons systems, particularly in targeting decisions and especially before the actual use of force.

Meaningful human control is fundamental to ensure accountability, compliance with international humanitarian law, and the protection of human dignity in armed conflict.

An AWS would be incompatible with IHL if it cannot be controlled by humans and, therefore, cannot be used in compliance with IHL, including if its use:
- Cannot be directed at a specific military objective;
- May cause superfluous injury or unnecessary suffering; or
- Have effects that cannot be limited as required by IHL, or functions that cannot be sufficiently understood, predicted, and explained.

A AWS would also be incompatible with IHL if its use may preclude attribution of State and individual legal responsibilities for the consequences of their use.

Positive obligations, in the form of regulations, should be developed to ensure humans exercise meaningful control in the use of AWS, in line with their obligations under IHL and ethical requirements, notably over the critical functions of AWS, such as selection of targets and application of potentially lethal force.

While recognizing that the nature and degree of human control may vary during all/different stages of a weapon’s development and use, in order for the use of an AWS to be compatible with IHL, its human operator must be able to:
• Impose adequate environmental limits in place, including spatial and temporal limits;
• Approve any decision on determining the operational context through a sufficient level of situational awareness;
• Be certain on the reliability and predictability in the identification, selection, and engagement of targets;
• Take the necessary precautions during the conduct of operations to ensure that a weapons system is not able to change mission parameters without human validation.
Respondent Response

- Supervise and ensure intervention where necessary as to interrupt and deactivate the weapon during its operational phase, as well as verify that auto-deactivation functions work as legally required.

It is the responsibility of commanders and operators to ensure that the use of the system is compliant with their legal obligations.

In the GGE, some views have been expressed suggesting that increasing the level of autonomy of weapons systems could enhance adherence to International Humanitarian Law standards. According to this line of argument, autonomous weapons, if programmed with the core principles and guidelines of IHL, have the potential to achieve a level of compliance more substantial than commonly anticipated by critics.

Addressing that argument requires a focused critique on legal grounds, particularly concerning the principles of distinction, proportionality, and precaution.

The principle of distinction requires combatants to distinguish between military objectives and civilian objects, as well as between combatants and civilians. The primary legal challenge for autonomous weapons is their current inability to make such distinctions with the high degree of judgment and contextual understanding that human operators possess. This challenge is not merely technical but deeply legal, as any failure to comply undermines the very essence of IHL, risking unlawful harm to civilians and civilian infrastructure.

The principle of proportionality demands that the harm caused to civilians and civilian property must be proportionate to the anticipated military advantage. The legal issue with autonomous weapons in this context lies in their programmed nature, which might not dynamically assess the evolving situation on the battlefield to weigh the military advantage against potential civilian harm accurately. The lack of this critical evaluative capability could lead to actions that violate the proportionality principle, a cornerstone of IHL designed to limit the effects of armed conflict.

The principle of precaution mandates that all feasible precautions be taken to avoid or minimize incidental loss of civilian life and damage to civilian objects. The application of this principle requires ongoing, situation-specific judgments that autonomous systems are fundamentally challenged to replicate. The legal concern here is that without the nuanced, informed decision-making that human oversight provides, the deployment of autonomous weapons may not fulfill the rigorous standards set by the precaution principle.

Moreover, the concept of “constant care” emerges as the critical aspect within the principle of precaution, emphasizing the necessity to permanently and continuously take all feasible precautions to avoid, and in any event to minimize, incidental harm to civilians and civilian objects during military operations.

This key aspect of precaution underscores the importance of constant, ongoing vigilance and careful consideration in the conduct of hostilities, to ensure that actions are both deliberate and measured. The principle of meaningful human control is intrinsically linked to this concept, as it posits that human control are indispensable in making nuanced decisions that automated systems alone cannot. A comprehensive understanding of the operational context is key to assess the proportionality of an attack and to distinguish between combatants and civilians—fundamental tenets that underpin the principle of precaution and, by extension, the aspect of constant care. Through this linkage, meaningful human control becomes a cornerstone in operationalizing the principle of precaution and the core humanitarian objectives of IHL.

Another key legal aspect of using autonomous weapons is the difficulty in attributing responsibility for their actions, especially when they fail to adhere to IHL principles. The “black box” nature of the decision-making processes of some autonomous systems’ complicates tracing the rationale behind certain actions, challenging the legal frameworks designed to hold individuals or states accountable for violations of IHL.
While proponents argue that autonomous weapons could serve military necessity without compromising humanity, the essence of IHL is to balance these considerations with human decision-making at its core. The depersonalization of decision-making in warfare raises profound legal and ethical questions about the role of humanity in conflict—a balance that autonomous systems, as currently conceived, are ill-equipped to navigate.

In sum, while the theoretical alignment of autonomous weapons with IHL principles is debated, significant legal hurdles remain. On a theoretical level, these challenges are not insurmountable, but in practical terms they underscore the current limitations of autonomous weapons systems for the fulfilment of the nuanced, context-dependent requirements of IHL.

While contributions to the GGE suggest that AWS could potentially align with IHL principles, including constant care, both legal and technical challenges significantly undermine this perspective. The inherent limitations in current AWS technology, combined with the nuanced requirements of IHL principles, indicate that reliance on autonomous systems to indirectly address concerns related to humanity and military necessity is premature and fraught with risks.

Brazil’s contributions to the discourse on AWS and IHL stress the importance of maintaining a human element in the decision-making processes of these systems to ensure compliance with the principles of distinction, proportionality, and precaution.

Bulgaria

Which elements/characteristics would make a LAWS incompatible with IHL?

The international humanitarian law does not specifically prohibit the use of autonomous weapons systems. The lawfulness of any weapons system can be determined by two main criteria—being inherently indiscriminate nature and causing superfluous injury and/or unnecessary suffering.

Under the first criterion, the law prohibits employment of methods and means that cannot be directed at a specific military objective and weapons the effects of which cannot be limited. The prohibition also includes systems unable to make a distinction between military objectives and civilian objects.

Under the second criterion, a weapon is assessed by its normal design and intended use.

These two criteria are incorporated in the underlying IHL principles of distinction, proportionality and precaution.

Also, autonomous weapons systems operating completely outside human control and a responsible chain of command are considered to be incompatible with IHL.

Does compliance with IHL depend on the use of LAWS in a specific context and if so, in which manner?

Application of international humanitarian law is at the heart of the two tier approach that aims at prohibiting autonomous weapons systems which cannot comply with IHL and at regulating other autonomous weapons systems to ensure their compliance with the provisions of IHL.

Therefore, the fully autonomous weapons systems as incompatible with IHL are, de facto, prohibited. States should make a commitment not to develop, produce, acquire, deploy or use such weapons systems.

Under the two criteria, mentioned in question 3, the lawfulness of autonomous weapons could be considered in the relation to the operational environment they operate in and the nature of their potential targets. The employment of autonomous systems in a restricted operational
environment (high seas, under sea or space) with limited or none presence of civilians and civilian objects and with comparatively easy identifiable military objectives could be considered as acceptable in respect to IHL. Yet, today the majority of international and non-international armed conflicts are fought in urban areas in the constant presence of non-combatants. Fielding and use of autonomous weapons in such complex urban environments increase significantly the potential of a breach of IHL norms and its principles thus demanding introduction of further regulations.

Regulation of other lethal weapons systems featuring autonomy in order to ensure compliance with the rules and principles of international humanitarian law should include the introduction and implementation of certain policies and measures.

Human control is central to the IHL compliance and ethical acceptability of autonomous weapon systems. It must be exercised and retained over the whole life cycle of an autonomous system in order to guarantee that employment of such weapons systems fully complies with the IHL and its key principles of distinction, proportionality and precaution in attack. Human-machine interaction is of prime importance at the various phases of research and development, validation, deployment and use of autonomous weapons systems, especially in the targeting cycle.

Legal reviews under Article 36 of AP I assess at a national level the lawfulness under IHL regulations of a new weapon, means or method of warfare. The requirement to carry out legal reviews also flows from the obligation to ensure respect for IHL. Conducting legal reviews are crucial in ensuring a State’s armed forces comply with IHL in light of fast-paced technological advancements. These legal reviews should examine weapons systems against biases, as comprehensive testing goes into assuring a system works as intended. Any potential alteration attributable to infield/machine learning and/or self-learning could require conducting an additional/new legal review procedure in order to guarantee IHL compliance. Potentially, new methods of testing of such systems could be introduced thus raising a lot of practical challenges and questions. When conducting reviews, States should focus on measures necessary to ensure human control over weapons and the use of force.

Estonia

International law, including IHL, fully applies to LAWS. International humanitarian law is a robust legal framework, which is capable of governing new weapons technologies.

We reiterate, however, that any weapons system, irrespective of its autonomous functionality, must only be used in strict compliance with international law, in particular IHL and human rights law. IHL remains a robust and dynamic regulatory regime. It can deal with a range of emerging technologies, including weapons systems with autonomous functionality. Much of the law has been drafted in a technology-neutral manner. The principle of distinction, the principle of proportionality, and the obligation to take precautionary measures, provide examples of that. These rules and principles are fully applicable and relevant to the use of LAWS.

We would like to draw attention to a few more specific rules that we see as particularly pertinent to these weapons. First, Article 51(4) of Additional Protocol I to the Geneva Conventions prohibits the use of weapons which cannot be directed at a specific military objective. Second, the same provision prohibits the use of weapons the effects of which cannot be limited as required by IHL. Third, Article 57(2) of Additional Protocol I requires military commanders and operators to take feasible precautions in the choice of weapons with a view to avoiding, and in any event to minimising, collateral damage.

Strict compliance with these rules of IHL would go a long way in addressing the humanitarian concerns that have been raised in relation to weapons systems with autonomous functions. Taking this into account, we find it unnecessary to focus on identifying which LAWS with which
characters would be prohibited under international law, as the same existing principles and rules apply to LAWS as to other weapon or weapons systems. LAWS that cannot meet the requirements or prohibitions stated in IHL, are prohibited.

We acknowledge, however, that such weapons systems can create uncertainties when it comes to the interpretation and application of the law. One of the examples being commanders making contextual assessments required by law. While discussing the legal matters of using LAWS, the black box effect should also be taken into account. Even if sufficient data is available to LAWS for making decision, how the algorithm predicts the likelihood of, for example, civilian casualties or anticipated damage to certain objects, remains non-transparent. Such matters merit further discussion.

IHL is important to all functions of weapons systems. The relevance of IHL and the need to take IHL into account when developing functions involved in target selection and engagement is obvious because IHL extensively regulates attacks. Article 57(1) of Additional Protocol I to the Geneva Conventions requires States to take constant care to spare the civilian population, civilians and civilian objects not just in attacks but in the conduct of military operations more generally. This suggests that other functions, such as the autonomous movement of a weapons platform, need to be developed and implemented with the safety of civilians and civilian objects in mind.

We share the view that humans must retain ultimate control and responsibility in relation to the use of force in armed conflict. We believe that humans should continue to be able to make ultimate decisions with regard to the use of lethal force, exert sufficient control over lethal weapons systems they use and remain accountable for decisions over life and death.

The need to exercise human control over the use of force does not arise from any discrete rule of international law. Rather, human control constitutes a practical means for ensuring that the use of force complies with international law. We do not think, however, that it would possible or even desirable to define a universal technical standard for the nature or amount of control that would be considered ‘meaningful’ or ‘appropriate’. The precise nature of control to be exercised will necessarily depend on the characteristics of the weapons system, the circumstances of its deployment and the operational environment.

However, we believe that it possible to make a general legal statement about the amount of human control necessary. We note that States are under an obligation to respect and ensure respect for international humanitarian law in all circumstances. We also note that individuals who decide upon attacks to have a duty to take precautionary measures to ensure compliance with rules on the conduct of hostilities. Therefore, we put the required human element in the following general terms: **humans must exercise such control over LAWS as may be necessary to ensure that the weapons system operates consistently with international law.**

It has been suggested that weapons systems with autonomous functionality are inherently indiscriminate, because they are unable to distinguish between lawful and unlawful targets, or to assess the proportionality of collateral damage. Nevertheless, weapons systems themselves have no obligation to comply with the law, as the ultimate responsibility for ensuring compliance with international law lies with States and humans. Thus, to our mind, the critical question is whether LAWS is capable of being used by an operator consistently with international law, especially IHL. This is a question that a State must answer in the affirmative prior to deploying a weapon. In this regard, conducting weapons reviews is an essential tool.

Commanders and operators, for their part, must use weapons consistently with the law in the actual conduct of hostilities. They can rely on a weapons system with autonomous functions only if they are confident that the system, given its fixed and programmable features, and the
Respondent: Finland

operational situation prevailing at the time, would not lead to breaches of the law. This assessment forms a part of the commander’s and operator’s duty to take precautionary measures under IHL.

Ensuring compliance with IHL will require a series of human interactions with a weapons system. In some operational contexts, programming rules of engagement into a weapons system will restrict the operation of the weapon such that compliance with the law is virtually guaranteed. In other, more complex circumstances, continuous human supervision of the weapons system might be indispensable. We believe that it is the combination of human interventions undertaken in such a system, rather than any of them considered in isolation, that must amount to human control necessary for ensuring compliance with the law.

What is more, we consider the environment where a weapons system is deployed to be highly significant. To some degree this significance arises from existing international law, which varies slightly based on the domain of warfare. For example, landmines and naval mines are addressed by different treaty-based rules.

But even where the applicable rules are the same, the degree and nature of human oversight required to ensure compliance with IHL depends on the operational environment and should, therefore, be assessed case by case. For example, the human control to be exercised over LAWS in urban warfare, where the risk of harming civilians is particularly acute, may well be different from the control required in submarine warfare, where risks to civilians are more limited.

In conclusion, the existing rules of international law, including IHL, specify which weapons are prohibited. As those rules fully apply to LAWS, it would be beneficial to compare the characteristics of LAWS to the existing rules. If a specific LAWS cannot be used in accordance with those principles and rules, that LAWS is also prohibited.

Operating completely outside of human control and responsible chain of command would deem LAWS incompatible with international law, including IHL. Incompatibility with IHL may also stem from the system’s inherent inability to comply with its norms and principles, for example systems making autonomous deployment decision without capacity to distinguish military and civilian targets, or persons hors de combat.

Contextual assessment is crucial when it comes to IHL compliance on the use of LAWS; It is compulsory to have a specific and limited mission framework for the use of LAWS (target setting, spatial and temporal limits, human approval for any substantial modification of the missions parameters) as well assurance that the weapon system will act in a foreseeable manner, thus the commanders and operators would have to be able to predict (prospective focus) as well as trace and explain (retrospectively) the behaviour of the weapons system. The minimum requirement for that is to have an understanding of the performance characteristics of the system as well as the operational environment. Detailed definition of the intended use-cases, combined with careful tuning of the box-of-operation, is of vital importance. In the final decision, military necessity, risks, and potential benefits have to be judged and this requires full understanding of the complexity of the task as well as high human ethical standards.

The importance of operational context for the legality of use of LAWS should be noted also from the perspective that like any other weapon or weapon system, LAWS that are not inherently incompatible with IHL may still be used in violation of IHL. In these situations, the issue of legality is not the use of LAWS as a means of warfare, but rather the way it is being used.
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<th>Respondent</th>
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<td>It is also crucial to add that meaningful human control cannot always require the technical capability to cancel an attack that has already commenced, and human control does not necessarily have to be exercised contemporaneously with the delivery of force. As stated in our food-for-thought paper in 2020 on Considerations on the appropriate level of human involvement in LAWS: “If the lack of communication in an off-the-loop use-case has been taken into account in all the previous phases, pre-planned or unexpected loss of communication will not cause harm. Communication channels may be deliberately cancelled due to operative reasons (to maintain radio silence), or they may be lost as a result of jamming, interference, or physical battle damage. Online supervision and control is not always feasible. By definition, autonomy is about self-sustainability and the ability to cope with the specified mission without external assistance. If on-the-loop communication is required for using a weapons system, then the system is not autonomous in its critical targeting and attack functions, i.e., it does not qualify as LAWS.”</td>
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<td>France</td>
<td>LAWS incompatible with IHL can be described as follows:</td>
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<td>- Systems of a nature to cause superfluous injury or unnecessary suffering;</td>
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<td>- Systems that are inherently indiscriminate and/or incapable of distinguishing between civilians, enemy combatants and combatants hors de combat;</td>
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<td>- Systems the effects of which cannot be limited, anticipated and controlled, as required by international humanitarian law in the circumstances of their use;</td>
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<td>- Systems operating completely outside human control and a responsible chain of command (i.e. “fully” lethal autonomous systems as defined under point 2).</td>
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<td>Weapons systems that cannot comply with IHL (see above) are de facto prohibited and should not be developed or used. As such, States should outlaw the development, production, acquisition, deployment, transfer and use of lethal autonomous weapons systems incapable of being used in accordance with international law, including IHL.</td>
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<td>With regard to other systems that are capable of being used in accordance with IHL (i.e. partially lethal autonomous weapons systems as described under point 3), States must implement policies and measures to ensure compliance with IHL:</td>
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<td>- Legal reviews should assess whether these systems are capable of being used in conformity with applicable international humanitarian law and international law, taking into account existing capacities and capabilities. These legal reviews should consider, inter alia, the technical performance, anticipated use, intended tasks and types of targets, as appropriate. Realistic system developmental and operational test and evaluation should be conducted, helping to understand the likely effects of employing the weapon in different operational contexts.</td>
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<td>- Human control, which may take various forms and be implemented at various stages of the life cycle of a weapon, must ensure that the use of autonomous weapons systems is in compliance with applicable international law, in particular international humanitarian law. In determining the quality and extent of human control, a range of factors should be considered, including the operational context, and the characteristics and capabilities of the weapons system as a whole.</td>
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• Sufficient human control requires that: (1) humans make informed decisions about the deployment and use of weapons; (2) humans have sufficient information to ensure that force is used in accordance with international law, given what they know about the potential target, the capabilities and characteristics of the weapon to be used, and the operational context in which the weapon is deployed.

Germany

IHL rules are only triggered by concrete effects of the use of a weapon (= effects-based law). Only the real-world effects count. The general rules of international humanitarian law govern the conduct of hostilities, but not the weapon systems as such or the technologies used in weapon systems. There is one exception, Art. 36 AP I. This provision requires states to determine in the study, development, acquisition or adoption of a new weapon, means or method of warfare, whether its employment would, in some or all circumstances, be prohibited by international law. Article 36 AP I is in Germany’s view of utmost importance with regard to potential legal challenges posed by emerging technologies in the area of LAWS.

Since it is impossible in the case of a fully autonomous weapon system (see definition above) to determine whether it can be employed in line with international law because its actions are not predictable, it is Germany’s position that in this particular case it is already the system as such which is incompatible with international law.

In all other cases, it might only be the use of the system in specific contexts that is incompatible with IHL. This is the case if its use amounts to an indiscriminate attack in the sense of Article 51 (4) AP I or the corresponding obligations under customary international law or a violation of any other substantial provision of IHL (e.g. prohibition of unnecessary suffering and superfluous injury; prohibition to fight persons hors de combat).

Japan

Japan commits to the consensus final report of the 2023 GGE on LAWS which states that weapons systems based on emerging technologies in the area of LAWS must not be used if they are incapable of being used in compliance with IHL. Japan also commits to the requirement of control with regard to weapon systems based on emerging technologies in the area of LAWS, which is needed to uphold compliance with international law, in particular IHL, including the principles and requirements of distinction, proportionality and precautions in attack.

When discussing weapons systems based on emerging technologies in the area of LAWS, it is important to note that in determining the IHL compliance of a weapons system, existing IHL obligations are imposed on the state or individual party to the conflict, and not on machines. The involvement of human beings who can be held accountable under IHL is essential for the use of weapon systems in compliance with international law, especially IHL.

Therefore, Japan commits to the importance of human involvement. Regarding how we can ensure this human involvement, it is important that humans are involved responsibly throughout the weapon's life cycle, and especially, that such weapons systems should be used under the responsibility of the human command and control. Indeed, there is consensus among many countries on the importance of the element of human responsibility.

Luxembourg

The most relevant, but not exclusive, aspects of IHL in the context of LAWS are the principles of distinction, proportionality, and precaution as laid out in the Geneva Conventions and their additional protocols. These principles require for attacks to be directed exclusively against military objectives, anticipated damage to civilians and civilian objects to be proportionate to the military advantage achieved, and for precautions to be taken to minimize damage to civilians and parties not involved in the conflict. Furthermore, the objectives and purposes of the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or
Respondent: Republic of Korea

Response: to Have Indiscriminate Effects, are an essential and integral part of International Humanitarian Law (IHL) and should fully apply to the development and deployment of LAWS.

Elements and characteristics, which would not be in line with the principles mentioned above would make the LAWS incompatible with IHL. As a LAWS may be unable to abide by these principles for several reasons, such as limited sample sizes during training, the inherent unpredictability of combat situations, or due to malicious interference, its actions may always violate IHL, if not supervised by a human being. As IHL governs the right of parties to an armed conflict, this is the context, in which the use of LAWS should be in compliance with IHL.

In this regards, a combatant’s reliance on autonomous functions to identify, select, or engage targets:

a) must be in good faith and in light of the information available at the time;

b) must be consistent with due diligence in the implementation of the requirements and principles of distinction, proportionality, and precautions in attack, under which the lawfulness of such reliance may depend on, inter alia: (i) the expected performance of the autonomous function; (ii) the alternatives, consistent with customary military practice, to relying on autonomous function; and (iii) the urgency of the situation.

Respondent: Russian Federation

Response: Compatibility with IHL cannot be defined by purely technical characteristics nor level of autonomy of LAWS. Compliance with the IHL requirements and principles, including inter alia distinction, proportionality and precautions in attack, in the potential use of LAWS requires inter alia that human beings make certain judgements in good faith based on their assessment of the information available to them at the time.

Norms of international law, including those of international humanitarian law, fully apply to LAWS and contain a number of important limitations. In this context, we attach considerable importance to the universalization of the four 1949 Geneva Conventions and their three Additional Protocols. In our view, concerns regarding LAWS can be addressed through faithful implementation of the existing international legal norms.

For instance, IHL prohibits to choose methods and means of warfare of a nature to cause superfluous injury or unnecessary suffering. Parties shall take precautions with respect to attacks. The Article 36 of 1977 Additional Protocol I to the 1949 Geneva Conventions stipulates the necessity to conduct a legal review in the study, development, acquisition or adoption of new weapon.

Existing norms and principles of international law, including IHL, do not need to be modernized or adapted to the specific features of LAWS. At the moment, we do not see any convincing reasons requiring immediate restrictions and bans against such type of weapons. We believe the discussions aiming at negotiation of certain “rules of conduct” in relation to LAWS to be premature.

The principles of humanity, the dictates of public conscience, as well as the human rights dimension cannot be used as the absolute and sole sufficient condition to impose restrictive and prohibitive regimes on certain types of weapons.

Strict compliance with IHL norms and principles in situations of armed conflicts remains one of the Russian Federation’s priorities.

We consider human control over the operation of lethal autonomous weapons systems as an important limiting factor. For these purposes, the control system of LAWS should provide for intervention by a human operator or the upper-level control system to change the mode of operation.
of such systems, including partial or complete deactivation. At the same time, we believe that specific forms and methods of human control should remain at the discretion of States and can be ensured by means other than direct control.

Control can be exercised by means of:

a) increased reliability and fault tolerance;
b) limitations on types of targets;
c) limitations on duration of operation, geographic scope and scale of use;
d) timely intervention and deactivation;
e) testing of LAWS in real operation environment;
f) admitting persons who have successfully mastered the procedures of use of LAWS to management (control);
g) control over the production process of separate elements and the product as a whole;
h) control over presorting and disposal of separate elements and the product as a whole.

We consider it inappropriate to introduce the concepts of “meaningful human control” and “form and degree of human involvement” promoted by individual States into the discussion, since such categories have no general relation to law and lead only to the politicization of discussions.

**State of Palestine**


**Switzerland**

AWS that cannot respect IHL are ipso facto prohibited. The use of other AWS should be regulated, notably to ensure that they respect IHL.

With regard to this two-tier approach, an AWS would be incompatible with IHL if its effects cannot be limited, anticipated and controlled, in the circumstances of its use (i.e. the specific context where/when the system is used). Notably this would be the case if a system was operating completely outside of human control and a responsible chain of command. An AWS would also be incompatible with IHL if it could not be directed at a specific military objective or if its effects cannot be limited as required by IHL and consequently were of a nature to strike military objectives and civilian objects without distinction. Such a system would be indiscriminate by nature. An AWS would also be incompatible if it would be of a nature to cause superfluous injury or unnecessary suffering, if it is intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment or if it would be incompatible with any other applicable treaty or customary international law rule.

Switzerland is pleased to note that many of the proposals now on the table take into account the interplay of situational factors (e.g. characteristics of the weapon; expected targets), and are grounded in the compliance with international humanitarian law in these particular circumstances, and the human control of autonomy that this requires.

**United States of America**

*Which elements/characteristics would make a LAWS incompatible with IHL?*

The elements/characteristics noted above do not make a weapon system incompatible with international humanitarian law (IHL). Any weapon system would only be per se incompatible with IHL if an applicable treaty or customary international law has prohibited its use under all
circumstances, such as if the weapon falls within an existing IHL category of weapon prohibited from use in all circumstances. IHL prohibits the use of an autonomous weapon system if it is of a nature to cause superfluous injury or unnecessary suffering, if it is inherently indiscriminate, or if it is otherwise incapable of being used in accordance with IHL. To prevent the development and use of such systems that cannot, under any circumstances, be used in compliance with IHL: 1. Autonomous weapon systems must not be designed to: (a) Target civilians or civilian objects, or to spread terror among the civilian population; (b) Conduct engagements that would invariably result in incidental loss of civilian life, injury to civilians, and damage to civilian objects excessive in relation to the concrete and direct military advantage anticipated; or (c) Conduct engagements that would not be the responsibility of the commanders and operators using the system.

Does compliance with IHL depend on the use of LAWS in a specific context and if so, in which manner?

Compliance with IHL in the use of autonomous weapon systems depends on satisfying applicable IHL requirements that govern the use of any weapon system (not prohibited per se) to conduct attacks. IHL requires that the use of an autonomous weapon system to conduct attacks be consistent with, inter alia, distinction, proportionality, and precautions in attack.

A combatant’s reliance on autonomous functions to identify, select, or engage targets:

(a) Must be in good faith and in light of the information available at the time.

(b) Must be consistent with due diligence in the implementation of the requirements and principles of distinction, proportionality, and precautions in attack, under which the lawfulness of such reliance may depend on, inter alia:

(i) the expected performance of the autonomous function;

(ii) the alternatives, consistent with customary military practice, to relying on the autonomous function; and

(iii) the urgency of the situation.

Distinction. Civilians and civilian objects must not be made the object of attack. Attacks may only be directed against combatants and other military objectives. A military objective, insofar as objects are concerned, means any object which by its nature, location, purpose or use makes an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage. To ensure effective implementation of the principle of distinction in attacks involving the use of autonomous weapon systems:

Commanders and operators must have the intention of striking specific or potential targets that constitute military objectives or of operating the system within specific locations constituting military objectives to deny enemy forces access to such locations.

Proportionality. The expected loss of civilian life, injury to civilians, and damage to civilian objects incidental to attacks must not be excessive in relation to the concrete and direct military advantage anticipated. To ensure effective implementation of the principle of proportionality in attacks involving the use of autonomous weapon systems:

A commander must not direct or authorize subordinates to use the weapon system when the commander has assessed that the expected loss of civilian life, injury to civilians, and damage to civilian objects incidental to the use of the weapon system will be excessive in relation to the concrete and direct military advantage anticipated.
Precautions in Attack. Feasible precautions must be taken in planning and conducting attacks to spare, as far as possible, civilians and civilian objects from the loss of life, injury, and damage or destruction. Feasible precautions are those that are practicable or practically possible, taking into account all circumstances ruling at the time, including humanitarian and military considerations.

Finally, it is important to recognize that international law does not contain a specific requirement that weapons must be subject to “human control” or that “human control” is an end in itself. Indeed, the term is not found in international humanitarian law. Rather, human control is a means – not the only means – that can enable compliance with IHL.
Risk mitigation and confidence building

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.

Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.

<table>
<thead>
<tr>
<th>Respondent</th>
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<tbody>
<tr>
<td>Australia</td>
<td>The 2023 LAWS GGE report concluded that ‘states must ensure compliance with their obligations under international law, in particular IHL, throughout the lifecycle of a weapon system based on emerging technology in the area of LAWS. When necessary, states should, inter alia: (a) limit the types of targets that a system can engage; (b) limit the duration, geographic scope and scale of the operation of the weapon system; and (c) provide appropriate training and instruction for human operators’. Article 1(2) of the Draft Articles sets out measures during the development phase of AWS to ensure their effects in attacks are capable of being anticipated and controlled. Measures should include rigorous testing and evaluation, legal reviews, and consideration of potential precautions or features to be implemented in the design and use of the system to mitigate the risk of harm to civilians and civilian objects. Such precautions and features may include measures to:</td>
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<tr>
<td>Brazil</td>
<td>The conclusions of the latest GGE report have identified key issues regarding the potential development and use of autonomous systems, including the importance of defining controls to uphold compliance with international law; establishing limits on targets, duration, geographical scope, and scale of operations; determining whether employment is prohibited by international law; and encouraging the voluntary exchange of best practices between States. A shared understanding on these core issues must be underpinned by sound, solid and specific technical standards. In 2021, the Institute for Electrical and Electronics Engineers (IEEE) adopted the first Global Ontological Standard for Ethically Driven Robotics and Automation Systems (IEEE STD 7007-2021), which provides a comprehensive framework to address technical and ethical challenges and to foster an environment of shared transparency, accountability, and cooperation. The IEEE Standard could offer concrete options regarding future possibilities in addressing the challenges posed by Autonomous Weapons Systems in a collectively coherent manner. By integrating the IEEE standard in discussions about confidence-building and security improvement, the GGE can address practical measures and promote responsible practices in the development and use of Autonomous Weapons Systems. The standard's principles and technical specifications provide a solid foundation to establish common ground and understanding among delegations.</td>
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Bulgaria

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.

Risk assessments and mitigation measures during the design, development, testing and deployment of new weapons may be required to ensure compliance with these legal obligations:

- As new technologies demand more complex operational guidelines and instructions for use, States should develop more advanced working methods, training programs, conducting weapons inspections and even IHL educational programs for the military industry;

- Before the authorization of use of force, States must ensure the subordination of an autonomous system to a higher military authority in the chain of responsible command control;

- To avoid unintended engagements and loss of control over a system, prior to deployment of autonomous systems, the commanders and the operators must go through a rigorous and extensive process of training;

- Similar approach must be applied to autonomous systems themselves through conducting legal reviews and rigid testing of any weapons system;

- States to ensure the commander and the operators have deep and thorough understanding of the capabilities and functionalities of the system in use to enhance the level of predictability and reliability of the system’s performance and actions;

- Circumscription of autonomous weapons’ use through appropriate rules of engagement and establishing doctrine and procedures for the use of autonomous systems.

- Incorporation of self-deactivation, self-destruct mechanisms.

Please indicate a list of concrete confidence building measures with regard to development and use of LAWS.

Sharing, on a voluntary basis, more experience in conducting legal weapon reviews, especially from States implementing and/or developing procedures for reviewing autonomous systems, sharing good practices and lessons learned from national Article 36 procedures and policies in order to enhance transparency and confidence building among States.

Estonia

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS

Weapons reviews are a valuable tool to ensure the compliance of a specific LAWS with international law.

We find that in addition to conducting a weapons review when a new weapons system is taken into use, a weapons review should also be conducted when a weapon or weapons system is modified or used differently from its original intended use. What is more, if the autonomous function of a weapons system that does not comprise of physically connected sensors, weapons, command and control functions etc. lies for example in the command and control function, the compliance with international law of the entire physically not connected weapons system should be evaluated.

We support the suggestion to compile relevant good practices and national legislation to ensure legal weapons reviews of LAWS in order to establish that a LAWS can be used in compliance with international law, including IHL and international human rights law. We also support
compiling good practices and national legislation on ensuring that a human is always accountable for decisions on the development and use of weapons and ensuring human-machine interaction at every stage of a weapons system's lifecycle. It would be additionally beneficial to compile national good practices in managing and mitigating risks associated with the use of autonomy in weapons systems.

One of the risks associated with the development and use of LAWS is the difficulty of assigning responsibility. As the ultimate responsibility for compliance with international law lies with States and individuals, human responsibility and accountability must be maintained throughout the entire life-cycle of LAWS. It should be, therefore, ensured that the consequences of employing LAWS can be appropriately traced back to an individual and/or a State. If the use of LAWS cannot be attributed to an individual or a State, this would preclude assessing and imposing state responsibility and/or criminal responsibility for violations of international law.

However, in our opinion, the core problem is the question of who is accountable and responsible for which part of an autonomous weapons system. A commander assumes responsibility when a prohibited weapon is used or if the weapon causes superfluous injuries. However, a question of whether with regard to LAWS the manufacturer, programmer or other such persons also assume responsibility or accountability for such weapons, needs further analysis.

Additionally, it is unclear if and how the accountability of the aforementioned persons is affected by the fact that a State has carried out a legal weapons review. We find that these questions necessitate further analysis.

Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.

The sharing of best practices could be helpful, including in relation to national ethical guidelines for the military use of artificial intelligence and ensuring military documents and training for military personnel are updated to ensure compliance with IHL. We also support discussing the ethical implications of using LAWS in warfare and sharing relevant national ethical guidelines.

We welcome and support suggestions made by some of the Member States of the GGE to develop a compilation of best practices or guidelines on the use of LAWS. We also see merit in establishing a non-legally binding code of conduct to promote responsible behaviour and strengthen compliance with international law. This would help shed more light upon any uncertainties about the interpretation and application of existing law, might cover mechanisms by which the reliability and predictability of weapons systems can be ensured and assessed, and could assist States in conducting legal reviews of weapons systems that have autonomous functions.

Finland

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.

Risk assessment and mitigation measures should be an integral part of the design, development, testing and deployment of LAWS in order to minimize the risk of incidental loss of life as well as injuries and damage to civilians. The measures could include, but not be limited to, adequate and precise testing throughout the life cycle of the weapon system, training the personnel to ensure sufficient understanding of the weapon system deployed, having on board safety mechanisms and a clearly defined distribution of responsibility through the chain of command.

States should conduct sufficient, properly executed legal reviews that need to be critical, wide-scoped, multidisciplinary and detailed to the intended use-cases. The review process must be integrated into the entire lifecycle of LAWS, as software is updated and evolved. It would be useful to share best practices on legal reviews on voluntary bases as well as developing commonly agreed international standards to the reviews.
Measures to ensure predictability and traceability are central to mitigate risks involved, and to ensure accountability. In addition, States should constitute mechanisms for reporting violations, and conduct investigation of credible allegations of IHL violations by their armed forces, their nationals or on their territory.

**Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.**

Trust and sufficient transparency are important parts of confidence building measures and therefore traceability should be taken into account when planning national policies and in the development and deployment of LAWS. It’s not important only for ensuring State responsibility, but also for ensuring individual criminal responsibility for violations that may amount to war crimes or other most serious crimes under international law. Traceability could be established with measures enabling an after action review of the system to assess compliance with IHL of a system. Voluntary exchanges of information could also be used for strengthening transparency.

The difference between lethal autonomous weapon systems (LAWS) and partially autonomous lethal weapon systems (PALWS) lies in their nature, i.e. the human involvement in certain critical functions. However, the LAWS/PALWS distinction cannot hinge solely on proper human use of the system and should also be based on technical and organisational safeguards, such as devices, technical qualification and technical certification measures, or intrinsic design measures to prevent failures, risk of unintended engagements, risk of loss of control, misuse, risk of proliferation, risk of acquisition by unauthorized users - including terrorist groups - and relinquishment of human prerogatives.

Risk assessments and mitigation measures should be part of the design, development, testing and deployment cycle of partially autonomous weapons systems:

- States should implement strict qualification, verification, assessment and validation procedures throughout the life cycle of the system to ensure its reliability, as well as technical and organisational safeguards, to prevent failures, misuse, diversion and relinquishment of human prerogatives;
- States should ensure that clearly defined qualification processes are designed for partially autonomous weapons systems’ critical functions based on autonomous decision-making. These qualifications should enable control over the use of force and post-incident investigation/inspections. In particular, while the command may legitimately modify an assigned mission, a regulated technical and operational process must apply when changing the field of employment of a partially autonomous weapons system. Operational feedback will be systematically taken into account;
- States should formally define the chain of responsibility involved in the definition, design, development, qualification and use of a partially autonomous weapons systems in order to clearly identify the respective responsibilities of all the parties involved;
- States should adopt measures to prevent the diversion of partially autonomous weapons systems (i.e. by regulating the production, acquisition and transfers of such systems);
- States should implement measures to increase resilience of partially autonomous weapons systems against cyberattacks;
- States should implement, unless technically not feasible, measures procedures or mechanisms enabling the human operator to deactivate the system/ self-deactivation / self-destruction mechanisms if the system overrides the framework of its mission without human validation;
Where feasible and appropriate, verifiability and certification procedures covering all likely or intended use scenarios should be developed;

Voluntary exchanges of information, national policies, experiences and good practices could constitute a confidence building measure.

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.

- **Unpredictable system behavior, algorithmic biases, reliability.** Mitigation: adequate testing; legal reviews. Art. 36 AP I and adequate training for human decision makers and operators to understand the system’s effect and its likely interaction with its environment. Examination of training data. Intensification of international research and information exchange on questions related to unintended biases including those based upon gender aspects, taking into account the views from academia, industry and civil society, may contribute to identifying potential risk mitigation measures.

- **Loss of human control.** Mitigation: design, employment of alternative tools (safeguards) to ensure human control. Specific attention needs to be paid in the case of modifications of the system, also with a view to legal reviews. Application of temporal and spatial restrictions or limits to the operation of any weapons system with autonomous functions.

- **Lack of human judgement.** Mitigation: adequate training for human decision makers and operators to understand the system’s effect and its likely interaction with its environment.

- **Development, deployment and use of LAWS by non-state actors.** Mitigation through anti-proliferation tools as known for other dual use technologies/systems. Ensuring "physical security" and "non-physical safeguards" are considered in the development and procurement process, taking into account relevant IT expertise.

- **Lack of accountability.** Mitigation: establish clear chain of command and responsibilities of humans involved in the development, programming, testing, deployment etc. over the life cycle of the system.

Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.

The development of confidence building measures is particularly challenging. On the one hand, the development, deployment and use of weapon systems with autonomous functions rely on a number of dual-use technologies protected by specific intellectual property rights. Verifying that these dual-use AI-based applications comply with a potential instrument on LAWS is challenging.

Although it is the state’s responsibility to carry out legal reviews of weapon systems, the verification of algorithms, i.e. AI, poses a challenge to be overcome at this point of time.

Nevertheless, confidence building measures may be implemented at a more basic level. For example, it might be helpful to compile an overview of the responsible officials who work on the issue of LAWS, in order to enable direct communication channels.

For Japan, one particularly important issue to be addressed on this topic is how we may properly implement national responsibilities while maximizing the benefits posed by AI technology. In this regard, it is important to correctly understand the characteristics of AI technology and implement necessary controls in the process of promoting advanced autonomy, in other words, to take measures to reduce and avoid the risk of unintended and inappropriate behavior of AI technology, including in relation to AI bias. In order to maintain and improve the accuracy of AI
decisions, it is necessary to continue the process of collecting, analyzing, scrutinizing, testing and learning from vast amounts of data. Furthermore, those who use AI technologies and those who direct such use need to be educated and trained to ensure that they can responsibly utilize AI technologies.

As we have expressed in previous meetings, the risks to be identified and assessed include unintended engagements, loss of system control, proliferation, and acquisition of technology by terrorist groups, etc., in addition to civilian harm. On that basis, the following risk mitigation measures are suggested that can be incorporated throughout the life cycle of the weapon system: (a) controlling and limiting the types of targets with which the system can engage; (b) controlling and limiting the duration, geographic scope, and scale of weapon system operation through self-destruction, self-deactivation, and self-neutralization mechanisms; (c) reducing artificial intelligence bias and operator automation bias; (d) strengthening controls and improving decision-making on matters related to the use of force, including timing and accuracy.

For more details, please refer Article 6 of “the Draft articles on autonomous weapon systems – prohibitions and other regulatory measures on the basis of international humanitarian law” submitted by Australia, Canada, Japan, the Republic of Korea, the United Kingdom, and the United States.

Furthermore, Japan notes that as well as loss of system control, unintended engagements such as engagements against civilians and civilian objects, and the occurrence of engagements that have no operational military rationale, have consequences that are not desired by responsible military forces.

Finally, in incorporating technologies such as AI and automation into military applications, there is a need to improve technologies to avoid unintended and harmful consequences, as well as technologies to help unit commanders achieve their intended operational objectives. It is important to share good practices on risk mitigation measures, while respecting the national security considerations of each country. This is also meaningful from a confidence-building perspective.

Luxembourg

In the development of LAWS, several risks must be accounted for. For instance, the limited selection of data, which may lead to false conclusions on the part of the system, as well as inherent biases, is a risk that should be mitigated through a larger selection of learning examples. Additionally, malicious actors may deliberately manipulate training data, in order to introduce biases, which constitutes a further risk. Another risk is the extent to which a LAWS may be able to adapt to unpredictable situations, as only humans may be able to adapt their strategies and operations to evolving situations. For instance, in the context of autonomous detection of human targets, unless covered in training, LAWS may for example not be able to distinguish between an enemy combatant and civilian LAWS without meaningful human control and a responsible chain of command should be prohibited. Further, in order to safeguard appropriate human control over LAWS, legal reviews in line with Article 36 of Additional Protocol I of the 1949 Geneva Conventions should be developed and carried out in order to determine whether their use would be prohibited by international law and assess the reliability and predictability. A certification system validating the reliability of the systems should also be put in place.

On the battlefield, the commander and operator has also to retain meaningful human control over a LAWS. When activated, the LAWS should act in a predictable manner, in conformity with IHL and according to the intentions of its commander and operator. However, as combat situations are always unpredictable, they may escape predefined action plans, which constitutes a major risk regarding the compliance with IHL. The operators of LAWS should be able to adequately anticipate the functioning and effects of the system in different environments.
(reliability and predictability), in order to avoid engagements that would violate IHL and International law. **Human judgement** should be maintained during deployment (distinction, proportionality), and in making critical decisions on the use of force.

During the deployment, a **precise mission framework** *(in terms of targets and objectives)*, and temporal and spatial limits should be set. By setting precise deployment frameworks, unwanted interactions with the system's environment can be limited and the emergence of critical situations that the system could not resolve in compliance with IHL can be prevented. This is important in the light of the difficulty, if not impossibility of retracing or explaining decisions taken by LAWS in many cases. **Human approval** of any modification to the mission parameters should be required, to prevent the system from making autonomous decisions concerning the mission parameters, or the spatial and temporal framework of the mission. Finally, the **ability to deactivate** the system should be guaranteed, if required to prevent any violations of IHL.

Concrete confidence building measures in the context of the development and use of LAWS may include the commitment to retaining human responsibility and meaningful human control over the use of LAWS, the reaffirmation of the 11 guiding principles agreed on by the High contracting parties in the context of the *Convention on Certain conventional Weapons*, as well as the conformity with international law and IHL in particular. Furthermore, results and experiences of Article 36 reviews could be shared among states or group of states, to the extent possible. These measures would increase transparency among States and signal restraint and predictability both in the development and use of LAWS.

**Republic of Korea**

- **Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.**

  Introduction of measures to ensure distinction and proportionality in conducting attacks and precautions in attack as well as to ensure accountability will contribute to risk mitigation with regard to the development and use of LAWS. While some are illustrated below, please refer to the “Draft articles on autonomous weapon systems – prohibitions and other regulatory measures on the basis of IHL” as contained in CCW/GGE.1/2023/WP.4/Rev.2 for further details;

  a) Provision of training for commanders and operators on due procedures and limitations in conformity with IHL and other applicable international law;
  
  b) Retention of responsible chain of human command and control across the entire life cycle of the weapons system as applicable;
  
  c) Establishment of domestic mechanisms to ensure accountability
  
  d) Establishment of adequate safeguards measures including data protection.

- **Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.**

  Sharing of lessons learned on risk mitigation practices as well as information on national framework, strategies and policies on LAWS.

**Russian Federation**

When considering LAWS the Group should take into account considerable advantages of such weapons systems in the context of ensuring compliance with IHL norms and principles.

LAWS can show more efficiency than a human operator when performing the assigned tasks and reduce error probabilities. In particular, such systems are capable of considerably reducing the negative implications of the use of weapons in the IHL context, related to the human operator’s errors, his mental or physical state, moral, religious, and ethical attitudes. Their use in accordance with international humanitarian
Respondent  | Response  
--- | ---  
Switzerland  | Risk mitigation measures should be an integral part of a future instrument, and in particular of a two-tier-type regulation, to ensure compliance with the general obligations of the instrument and in particular with international humanitarian law. Such measures should be based on risk assessments that take into account both the risks associated with the use of a weapon and the inherent risks of the system, and should be integrated and standardized throughout the life cycle of the weapon system, from design and testing to training or use. Already in 2019, the CCW agreed that rigorous testing and evaluation of systems, legal reviews, readily understandable human-machine interfaces and controls, training personnel, establishing doctrine and procedures, and circumscribing weapons use through appropriate rules of engagement are examples of such measures.
A number of confidence-building measures could be useful, and be specified in, or based on, a future instrument, including discussions between armed forces on a) legality: how to ensure that the impact is in line with legal obligations; b) accountability - how to integrate the systems into chains of command, ensuring that personnel exercising control over the assessment and decisions related to their use, or how to train personnel; c) reliability - how to ensure predictability.

**United States of America**

Please indicate a list of concrete risks and/or risk mitigation measures with regard to the development and use of LAWS.

**Concrete Risks**

1. Risk of harm to civilians and civilian objects
2. Risk of unintended engagements (i.e., the weapon system engaging targets that the system operator did not intend to engage)

**Risk Mitigation Measures**

**Measures During Development**

Autonomous weapon systems may only be developed such that their effects in attacks are capable of being anticipated and controlled as required in the circumstances of their use, by the principles of distinction and proportionality. Measures during development to this end should include the following:

a. Rigorous testing and evaluation to inform an assessment of how the weapon system will perform in the anticipated circumstances of its use;

b. Legal reviews that consider, inter alia, whether the autonomous weapon system is capable of use in accordance with the principles of distinction and proportionality;

c. Consideration of potential precautions or features to be implemented in the design and use of the system to mitigate the risk of harm to civilians and civilian objects, such as measures to:
   i. control, limit, or otherwise affect the types of targets that the system can engage;
   ii. control, limit, or otherwise affect the duration, geographical scope, and scale of the operation of the weapon system, such as the incorporation of self-destruct, self-deactivation, or self-neutralization mechanisms into munitions or the system;
   iii. reduce automation bias in system operators;
   iv. reduce unintended bias in artificial intelligence capabilities relied upon in connection with the use of the weapon system; and
   v. otherwise enhance control or improve decision-making over the use of force, including relating to timing, precision, and accuracy.

**Measures Before and During Deployment To Ensure Accountability**

To ensure comprehensive accountability for the use of autonomous weapon systems:

1. A State should only deploy such weapon systems within the State’s general framework for the implementation of IHL, including: (a) dissemination of, and training on, IHL; (b) domestic law under which the State can hold its personnel accountable; (c) operation of such systems
within a responsible chain of human command and control; (d) internal mechanisms for the reporting of incidents that may involve violations of IHL; (e) investigations or other reviews of such incidents; and (f) appropriate actions in response to such investigations or reviews of incidents, including accountability for personnel.

2. States should provide with respect to their autonomous weapon systems: (a) Readily understandable human-machine interfaces and controls; (b) Guidance (e.g., policies, doctrine, and procedures), consistent with applicable IHL, for personnel regarding the proper use of the weapon system; (c) Training of personnel to understand such guidance and the capabilities and limitations of the weapon system’s autonomous functions in the anticipated circumstances of its use; and (d) Appropriate rules of engagement or other directives or orders circumscribing the use of the weapon system in military operations, consistent with applicable IHL.

**Measures During the Use of the Weapon System**

Assessments regarding the expected loss of civilian life, injury to civilians, and damage to civilian objects incidental to the use of the weapon system and the concrete and direct military advantage anticipated. In making such assessments, commanders should consider all information that is relevant and available at the time, which may include information about, inter alia:

(a) The presence of civilians or civilian objects within the area where and during the time when the weapon system is expected to be operating;
(b) The incidence of targets constituting military objectives that could be engaged by the weapon system in the operational area and time period;
(c) The performance of the weapon system’s autonomous functions in identifying, selecting, and engaging targets that constitute military objectives;
(d) The danger posed to civilians and civilian objects when the weapon system engages such targets;
(e) The effectiveness of any precautions taken to reduce the danger to civilians and civilian objects; and
(f) How the use of the weapon system is expected to protect friendly forces or civilians, neutralize enemy forces, or divert enemy forces’ resources, attention, and movement.

**Precautions that could be feasible in the circumstances of using autonomous weapon systems.** These may include:

(a) Adjusting the location where or times when the system is operating to reduce the likelihood of civilians being present;
(b) Giving warnings that enable steps to reduce the danger to civilians, such as avoiding locations where the system is operating;
(c) Monitoring the operation of the weapon system; and
(d) Other choices in the size and type of munitions and in the operation of the weapon system that reduce the danger to civilians and civilian objects, while offering the same or superior military advantage.

Considering the use of an autonomous weapon system, among other weapons or alternative courses of action, when such use could constitute a feasible precaution in an attack.
Please indicate a list of concrete confidence building measures with regard to the development and use of LAWS.

Confidence Building Measures

1. Voluntary exchange of best practices in the conduct of legal reviews of the adoption of a new weapon, means, or method of warfare, bearing in mind national security considerations or commercial restrictions on proprietary information.

2. Voluntary sharing of national practice relating to relevant military applications.

At the last Annual Meeting of the High Contracting Parties of the CCW held in November 2023, the Group of Governmental Experts (GGE) on Emerging Technologies in the Area of Lethal Autonomous Weapon Systems (LAWS) has agreed on a new mandate for work for a period of three years.

This new mandate reflects progress in the sense that it instructs the High Contracting Parties "to formulate a set of elements of an instrument taking into account the previous work of the GGE on LAWS and other examples of existing Protocols and another related normative or operational framework."

We have worked intensively for over a decade and have carried the discussion far from its origins, and this mandate underscores that our work is not starting from scratch. But at the same time, we have yet to take the more ambitious step towards the creation of a regulation structure. It is therefore imperative that we recognize the huge amount of work that has gone into the previous sessions of the GGE on LAWS and have a comprehensive, proactive approach that will allow us to fulfill our mandate.

Last July, United Nations Secretary-General Antonio Guterres presented the "New Agenda for Peace", in which he calls for the prevention of the militarization of emerging technologies and the signing of a binding document that regulates them. We encourage the High Contracting Parties to take note of this undertaking and integrate it under the work of the GGE on LAWS.

The current cycle of the GGE should recognize the common elements that have arisen through constructive engagement among delegations along the CCW discussions on autonomous weapon systems (AWS). We believe the following are central points of convergence on the concrete proposals considered in the last cycle of the GGE:

- The human element in the use of force and the recognition that AWS raise important challenges with respect to human control and judgment over the use of force.
- Ethical considerations, including undermining of human dignity, loss of human agency and erosion of moral responsibility and accountability in the use of force.
- The need by humans to retain responsibility and accountability for decisions on the use of force must be retained, since this cannot be transferred to machines.
- The fact that the development, production, possession, acquisition, deployment, transfer, or use of autonomous weapons systems under any circumstances should be in compliance with international law, particularly the principles of international humanitarian law.

Therefore, we would like to propose, for the consideration of the GGE, that our discussions include the following topics, that reflect the common elements that have arisen through the work of the GGE on LAWS with an understanding that these will lead to the fulfillment of our mandate outlined above:

- Characterizations and definitions,
- Application of International Law, including International Humanitarian Law,
The current mandate of the GGE is the most ambitious one till date since GGE was first established back in 2016. The GGE is tasked to work under this ambitious mandate for a period of three years and preferably finish its work by the end of 2025.

The work of the GGE will be taking place in the background of increasing support for negotiating a legally-binding instrument. In his policy brief on ‘New Agenda for Peace’, the UN Secretary General has also urged states to conclude a legally binding instrument on LAWS.

The GGE will not be starting its work from scratch. As we commence this result-oriented and outcome driven process, our mandate demands that we organize our work in a manner that takes into account the following in a comprehensive and a holistic manner:

- Previous work done and building upon the recommendations and conclusions of the Group,
- Example of existing Protocols,
- Proposals presented by the High Contracting Parties, and,
- Other options related to normative and operational framework.

It has been a long-held position of a large number of countries (including the NAM) that the issue of LAWS must be addressed comprehensively in all aspects. The humanitarian, legal, ethical and security dimensions must always remain integrated in a meaningful manner in the work of the GGE. The challenges highlighted by various delegations and the proposals put forward by them address various dimensions. Therefore, it is essential that we organize the work of our GGE in a way, which enables us to capture these vital ideas in an integrated manner.

In this regard, we believe that structuring our work around the following proposed indicative topics is a narrow interpretation of our mandate and may risk limiting the scope of our work in the GGE:

- Characterizations and definitions
- Application of IHL, including the relation of IHL with the concept of human control, judgment and/or involvement
- Risk mitigation and confidence building.
In view of the above, we would like to propose that our work in the GGE may be organized as per the following topics with a clear objective of formulating a set of elements of an instrument without prejudging our substantive viewpoints on each of those topics:

- Characterizations and definitions,
- Application of International Law, including in particular International Humanitarian Law,
- Human Machine Interaction/meaningful human control and Ethical Considerations,
- Security Considerations and Other Risks,
- Prohibitions and Regulations,
- Responsibility and Accountability,
- Risk Mitigation/Confidence Building Measures and Other Measures.