

1. It was affirmed that international law, in particular the United Nations Charter and international humanitarian law (IHL) as well as relevant ethical perspectives, should guide the continued work of the Group. Noting the potential challenges posed by emerging technologies in the area of lethal autonomous weapons systems to IHL, the following were affirmed, without prejudice to the result of future discussions:

- i. Ethical and moral considerations, particularly in relation to human dignity, continue to guide the work of the Group.
 - ii. [Apart from IHL, some delegations mentioned the relevance of other legal regimes, notably International Human Rights Law and International Criminal Law, where applicable.]
 - iii. [There were divergent views on the meaning of the Martens Clause and on the implications of taking moral and ethical responsibility beyond international law into account.]
- a) International humanitarian law, continues to apply fully to all weapons systems, including the potential development and use of lethal autonomous weapons systems.
- i. Parties to a conflict must use any weapons systems, including autonomous weapons systems, in accordance with applicable international law, in particular international humanitarian law and its principles of distinction, proportionality and precaution.
 - ii. International humanitarian law requires that humans through a responsible chain of command and control make judgments in conducting attacks in armed conflict, including attacks conducted with weapons systems based on emerging technologies in the area of lethal autonomous weapons systems.
 - iii. In cases involving emerging technologies not covered by the CCW and its annexed Protocols or by other international agreements, the civilian population and the combatants shall at all times remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity, and from the dictates of public conscience.
 - iv. No weapon system, including weapons systems based on emerging technologies in the area of lethal autonomous weapons systems, may be used if it is calculated to cause superfluous injury or is otherwise incapable of being used in accordance with fundamental principles of international humanitarian law.
 - v. IHL is addressed to humans. Associated legal obligations, including the rules of distinction, proportionality and precautions in attack, rest with those who plan, decide on and carry out attacks, including any attacks involving lethal autonomous weapons systems.
 - vi. [Delegations differed as to whether current IHL could cope with the challenges arising from LAWS or if further regulations, rules or clarifications were needed. Some delegations argued that human control could be achieved in practice across the targeting process, enabling humans to conduct assessments with regard to IHL as necessary. In this view, such processes,

when implemented properly, demonstrated that the existing legal regime was sufficient.]

b) Human responsibility for decisions on the use of weapons systems must be retained since accountability cannot be transferred to machines. This should be considered across the entire life cycle of the weapon system.

- i. Human judgement informed by knowledge of the operational context is essential in order to ensure force is used in compliance with international law, and in particular IHL.
- ii. Human responsibility over the use of force can be exercised through political direction in the pre-development stage and across the life-cycle of the weapon system, including: research and development; testing, evaluation, and certification; deployment, training, and command and control; use and abort functions; and post-use assessment.
- iii. The extent and quality of human-machine interaction in the operation of a weapon system based on emerging technologies in the area of lethal autonomous weapons systems should be informed by a range of factors, such as the operational context, the characteristics and capabilities of the weapon system, the performance and reliability of specific functions in the weapon system, and how human-machine interaction has been implemented in other parts of the life-cycle of the weapon system.
- iv. The totality of human-machine interaction must allow for the use of the weapon system consistent with applicable international law, in particular international humanitarian law.
- v. Adherence to the IHL principles of distinction, proportionality and precautions in attack rely on qualitative judgements based on contextual knowledge that can only be made by humans.
- vi. The use of force requires human agency and human intention. It is humans that apply IHL and are obliged to respect it. In particular, the target acquisition and engagement functions, which involve comprehensive assessments of a given situation (taking into account technical, legal, political, military and ethical considerations) requires the exercise of human judgement. Human operators and commanders need to understand, inter alia, the operational environment, since the use of force is contextual, and how the weapon system is likely to interact with the operating environment, in order to be able to ensure their use of force is consistent with applicable international law.
- vii. Human control, understood as translating human judgement and assessments into operations by design and in use of weapons systems, over the use of force must be exercised over the different stages of the life-cycle of all weapon systems, including those that employ autonomy.
- viii. [Further clarification is needed on the type and degree of human-machine interaction required, including human control over the use of force and its relationship with human judgement, including at different stages of a weapon's life cycle, in order to secure compliance with IHL.]
- ix. [Some delegations consider that the ability of a weapons system to deliver the effect intended by a human commander or operator could be supported

through cumulative interventions in different stages of a weapon system's life-cycle, which may allow for some autonomous functioning during the targeting cycle. Some delegations called for direct human control, both through design and in use.]

- x. [While some delegations stressed that a human judgement needs to be reasonably temporally proximate to an attack to remain valid, it was not clear that all delegations shared this view. At a minimum, there would need to be further exploration of the concept of “reasonably temporally proximate”, which is likely to be context-dependent, as well as of the chain of causality between a decision to use force and the actual attack.]
 - xi. [There were divergent views on the need for real-time supervision during the targeting and engagement cycle.]
- c) Accountability for developing, deploying and using any emerging weapons system in the framework of the CCW must be ensured in accordance with applicable international law, including through the operation of such systems within a responsible chain of human command and control.
- i. Humans at all times remain accountable in accordance with applicable international law for their decisions on the use of force.
 - ii. A State is accountable for its use of any weapons systems, including weapons systems based on emerging technologies in the area of lethal autonomous weapons systems.
 - iii. An individual, including a designer, developer, an official authorizing acquisition or deployment, a commander, or a system operator, is accountable for his or her decisions regarding the development, deployment, and use of weapons, including any weapons systems based on emerging technologies in the area of lethal autonomous weapons systems.
 - iv. The ability of a weapon system to be subjected to operational constraints is relevant to its ability to be used in compliance with international humanitarian law. A weapon system that is unsupervised, unpredictable and unconstrained in time and space would be unlawful.
 - v. Setting operational constraints on systems, regarding tasks, target profiles, time-frame of operation, scope of movement over an area and operating environment, could increase predictability and thereby assist with compliance with IHL, but, in general, would not alone be sufficient to ensure IHL compliance.
 - vi. [Some delegations argued that autonomous technologies could aid the human in complex combat environments, and that testing could provide the system with the predictability and certainty that would allow the human operator to comply with IHL. Other delegations expressed doubts that in complex operational environments, autonomous systems would act as expected or be capable of complying with IHL principles, which require human discernment and context-based assessments.]
 - vii. [There were divergent views on whether autonomy in critical functions challenged the maintenance of combatant and commander responsibility. Despite agreement that responsibility rests with the human and cannot be

delegated to a machine, some delegations thus viewed the existing rules on individual accountability and commander responsibility would be sufficient while others thought further clarity would be needed on how the requirements to determine responsibility (of States or individuals) would be fulfilled, given that the systems would be autonomous and that several actors would be involved in developing, deploying and using them.]

- viii. [There was disagreement over whether human control was contingent on an ability to intervene in the operation of a weapon, once activated or launched. Further clarity is needed on the quality and degree of the required intervention, and how it relates to the operational context and the legal assessment.]

d) In accordance with States' obligations under international law, in the study, development, acquisition, or adoption of a new weapon, means or method of warfare, determination must be made whether its employment would, in some or all circumstances, be prohibited by international law.

- i. National weapons reviews of the intended development or acquisition of a new weapons system are a useful and mandatory tool for ensuring weapons that employ autonomy comply with international humanitarian law which should be strengthened, including through greater transparency regarding legal review mechanisms, given the unique challenges posed by autonomy in weapons systems.
- ii. The legal review of new weapons systems, including those based on emerging technologies in the area of lethal autonomous weapons systems, should consider intended or expected uses of the weapon system.
- iii. Weapons systems under development, or modification, which significantly changes the use of existing weapons systems, must be reviewed as applicable to ensure compliance with IHL.
- iv. Intended uses of weapon systems that differ significantly from the intended uses that were considered when those systems were tested, evaluated, or otherwise reviewed, should be reviewed to ensure compliance with international humanitarian law.
- v. Specifically, to be lawful, a weapon system must be capable of being used in compliance with each of the following IHL principles:
 - a. *Distinction*: The parties to the conflict must at all times distinguish between civilians and combatants and between civilian objects and military objectives. Attacks may only be directed against military objectives. Attacks must not be directed against civilians or civilian objects. Indiscriminate attacks are prohibited.
 - b. *Proportionality*: Launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited.
 - c. *Precautions in attack*: In the conduct of military operations, constant care must be taken to spare the civilian population, civilians and civilian objects. All feasible precautions must be taken to avoid, and in

any event to minimize, incidental loss of civilian life, injury to civilians and damage to civilian objects.

- vi. [Nevertheless, different views were expressed on national weapons reviews. Some delegations view adequately robust and effective implementation of obligations to conduct national weapon reviews as useful in managing the challenges raised by lethal autonomous weapon systems. Others expressed concern about the sufficiency of such reviews and unique challenges posed to them by autonomous functions, including in instances where an autonomous system was capable of self-learning. Other delegations, while acknowledging the relevance of national weapons reviews in the context of LAWS, still pointed out that the lack of transparency or shared standards for how they should be conducted or how relevant law is interpreted, meant that the reviews alone were not sufficient to deal with the challenges LAWS pose to IHL. Some delegations called for greater transparency in the methods and outcomes of national weapons reviews, possibly with a view to the development of some best practices. Others expressed that national weapons reviews are in essence a national implementation mechanism and should remain as such.]
- e) When developing or acquiring new weapons systems based on emerging technologies in the area of lethal autonomous weapons systems, physical security, appropriate non-physical safeguards (including cyber-security against hacking or data spoofing), the risk of acquisition by terrorist groups and the risk of proliferation should be considered.
- f) Risk assessments and mitigation measures should be part of the design, development, testing and deployment cycle of emerging technologies in any weapons systems.
 - i. Human control or involvement at the development stage is not alone sufficient to ensure compliance with IHL for attacks in armed conflict given the inherently variable and unpredictable nature of real-world operational environments.
 - ii. In particular, the risks of civilian casualties and precautions to help mitigate the risk of civilian casualties should be considered. Other types of risks should be considered, as appropriate, including the risk of unintended engagements, loss of control of the system to unauthorized parties, risks of proliferation, acquisition by terrorist groups, and potential effects on the security environment.
- g) Consideration should be given to the use of emerging technologies in the area of lethal autonomous weapons systems in upholding compliance with IHL and other applicable international legal obligations.
 - i. Autonomous systems could provide significant military advantages but must not replace human decision making with respect to the use of force, as human judgment is critical for compliance with applicable international law.
 - ii. Some considered the data sets that would be used with autonomous systems could be incomplete, biased or inaccurate.
- h) In crafting potential policy measures, emerging technologies in the area of lethal autonomous weapons systems should not be anthropomorphized.
 - i. IHL imposes obligations on States and individuals, not machines.

- ii. Autonomy in the targeting and engagement cycle, that is, the ability for a weapon system to detect, select and engage targets, or to change target parameters, independently and without human control, understood as translating human intentions, judgements and legal assessments into operations, is a central characteristic of weapon systems of core interest to the Group.
 - iii. The characteristics of self-learning and self-adaption, the ability of a weapon system to learn, self-improve, evolve, define or modify its objectives or goals, or otherwise adapt to the environment, are also highly relevant. Similarly relevant is self-initiation, such that the use of force is triggered by something the system detects in the environment, other than in a strictly automatic sense, in a way that would not be necessarily foreseen by a human operation or commander. In the case of a weapon system capable of self-initiating an attack, the exact timing, location or nature of a given attack would not be known by the human user.
 - iv. *Predictability*, whether an operator can foresee the proper functioning of a weapon system, particularly the exact targets and the time and location of specific attacks, is a key consideration.
 - v. A related characteristic of importance is *explainability*, whether a system allows an operator to understand why it performs in a particular way.
 - vi. *Reliability*, whether the operator can trust the system to perform consistently as intended by the commander, is also crucial.
 - vii. Whether and how a system can be supervised and its operation intervened in, either through its recall, termination or deactivation by a human operator or commander, is another important characteristic.
 - viii. Technology should not be stigmatized.
 - ix. Research and development of autonomous technologies should not be restricted based on the rationale that such technologies could be used for weapons systems.
- i) Discussions and any potential policy measures taken within the context of the CCW should not hamper progress in or access to peaceful uses of intelligent autonomous technologies.
- i. Given the dual use nature of the underlying technologies, it is important to promote responsible innovation and to avoid hampering progress in or access to peaceful uses of related technologies.
- j) The CCW offers an appropriate framework for dealing with the issue of emerging technologies in the area of lethal autonomous weapons systems within the context of the objectives and purposes of the Convention, which seeks to strike a balance between military necessity and humanitarian considerations.