

Draft elements on possible consensus recommendations in relation to the clarification, consideration and development of aspects of the normative and operational framework on emerging technologies in the area of lethal autonomous weapons systems

Chair's paper

This paper is submitted under the responsibility of the Chair. The following are elements for discussion for possible inclusion in the report of the GGE, which will be prepared at a later stage. This paper does not prejudice the outcome of the 2021 GGE session, or the course of the discussion to follow.

(0) General considerations

1. Recall 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 to Have Indiscriminate Effects,
2. Recognize the potential risks and challenges posed by emerging technologies in the area of lethal autonomous weapons systems, including in ensuring respect for the principles of international humanitarian law and of international human rights law as well as for ethical considerations and in the maintenance of international peace and security,
3. Recognize also the potential for emerging technologies in the area of lethal autonomous weapons systems to be used in upholding compliance with international humanitarian law and other applicable international legal obligations, including by increasing the accuracy of weapons systems,
4. Acknowledge that algorithm-based programming relies on data sets that can perpetuate or amplify social biases, including gender and racial bias, and thus have implications for compliance with international law,
5. Avoid hampering progress in or access to peaceful uses of technologies, taking into account the dual use nature of the technology underlying intelligent autonomous technologies,
6. Affirm the need to clarify, consider and develop aspects of the normative and operational framework on emerging technologies in the area of lethal autonomous weapons systems,
7. Affirm that such a framework must strike a balance between military necessity, humanitarian imperatives and ethical consideration,
8. Reaffirm that in cases not covered by the Convention 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,

(1) Characterizations

- (a) Autonomous weapons systems are weapon systems that, once activated, can select and apply force against targets without direct human supervision or control.
- (b) Fully autonomous weapons systems are autonomous weapon systems that are designed to operate outside of any framework of human command and control.
- (c) Partially autonomous weapons systems are autonomous weapon systems that are designed to operate within a framework of human command and control.
- (d) Weapons systems that incorporate autonomy only into functions other than to select and apply force against targets are not autonomous weapons systems.

(2) Possible considerations

- (a) Not to develop, produce, acquire, deploy or use fully autonomous weapons systems.
- (b) Not to use any type of autonomous weapons system if it is of a nature to cause superfluous injury or unnecessary suffering, or if it is inherently indiscriminate, or is otherwise incapable of being used in accordance with the requirements and principles of international humanitarian law.
- (c) Not to use any type of autonomous weapons system that cannot, to a sufficiently high degree of reliability or predictability, perform their functions in accordance with the intention of a human operator and commander to comply with the requirements and principles of international humanitarian law.
- (d) To maintain sufficient human control over partially autonomous weapons. Toward this end, such weapons should be regulated through:
 - (i) Limits on the types of target, such as constraining them to objects that are military objectives by nature;
 - (ii) Limits on the duration, geographical scope and scale of use, including to enable human judgement and control in relation to a specific attack;
 - (iii) Requirements for human-machine interaction, notably to ensure effective human supervision, and timely intervention and deactivation.

(3) **Application of international law**

International law

1. International law, including the Charter of the United Nations, international humanitarian law, international human rights law and international criminal law applies fully to all weapons systems, including the development and use of autonomous weapons systems.
2. Potential use of autonomous weapons systems must be conducted in accordance with applicable international law, in particular international humanitarian law and its requirements and principles, including *inter alia* distinction, proportionality and precautions in attack. Such requirements must be applied through a chain of responsible command and control by the human operators and commanders.

Human responsibility and accountability

3. International humanitarian law imposes obligations on States, parties to armed conflict and individuals, not machines.
4. States, parties to armed conflict and individuals remain at all times responsible for adhering to their obligations under applicable international law, including international humanitarian law.
5. Human accountability and responsibility must be maintained throughout the entire life-cycle of weapons systems, including with respect to decisions on the use of weapons systems, since human accountability and responsibility cannot be transferred to machines.
6. Humans must at all times remain accountable in accordance with applicable international law for decisions on the use of force as well as for the development, deployment and use of autonomous weapons systems, including through the operation of such systems within a responsible chain of human command and control.
7. Comprehensive, context-based human judgement is essential in order to ensure that the potential use of autonomous weapons systems is in compliance with international law, and in particular international humanitarian law.
8. States must ensure accountability for lethal action by any weapon system used by the State's forces in armed conflict in accordance with applicable international law, in particular international humanitarian law.

(4) **Human-machine interaction**

1. As referred to in Section 2, paragraph 1 (d) above, sufficient human control requires that:
 - (a) Humans make informed, conscious decisions about the use of weapons.

- (b) Humans have sufficient information to ensure that force is used in accordance with the requirements of international law, given what they know about the target, the weapon, and the context in which the weapon is deployed.
 - (c) The weapon is designed and tested in a realistic operational environment, and humans are properly trained, to ensure that the weapon is deployed in a judicious manner.
2. Human control over the use of autonomous weapons systems can be exercised in various ways across the life-cycle of these weapon systems and through human-machine interaction.
 3. The phases of the life-cycle of a weapon system include: political direction in the pre-development phase; research and development; testing, evaluation and certification; deployment, training, command and control; use and abort; post-use assessment.
 4. Human-machine interaction, which may take various forms and be implemented at various stages of the life cycle of a weapon, should ensure that the potential 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-machine interaction, a range of factors should be considered, including the operational context, and the characteristics and capabilities of the weapons system as a whole.
 5. Identify good practices for human-machine interaction, including such practices identified in academic research or developed in industry, that can strengthen compliance with international humanitarian law when using autonomous weapons systems.

(5) Weapon reviews

1. In accordance with the obligations of States 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.
2. Encourage all States that have not yet done so to join Additional Protocol I to the Geneva Conventions of 12 August 1949.
3. Legal reviews of new weapons at the national level are a useful tool to assess nationally whether potential autonomous weapons systems would be prohibited by any rule of international law applicable to that State in all or some circumstances.
4. The following elements of practice should be applied in the study, development, acquisition, or adoption of autonomous weapons systems:
 - (a) States should consider key challenges in the regulation and nature of the systems through a regular evaluation process based on a set of criteria relevant for autonomous weapons systems and applied across the life-cycle of a weapon system.
 - (b) A weapon system under modification should be reviewed to determine whether the modification poses any legal issues.

(c) New concepts for the employment of existing weapons should be reviewed, when such concepts differ significantly from the intended uses that were considered when those systems were previously reviewed.

(d) In considering whether a weapon with new autonomous features or functions is consistent with the prohibitions against weapons calculated to cause superfluous injury or against weapons that are inherently indiscriminate, it may be useful to compare the weapon to existing weapons not falling under these prohibitions.

(e) In light of the particular challenges of autonomous weapons systems, including potential for self-learning and associated unpredictability, weapons reviews must be conducted with a full understanding of the weapons' capabilities and limitations, and sufficient confidence about its effects in the expected circumstances of use.

5. Where feasible and appropriate, inter-disciplinary perspectives must be integrated in research and development of autonomous weapons systems, including through independent ethics reviews bearing in mind national security considerations and restrictions on commercial proprietary information.

6. Encourage States to share, on a voluntary basis, information and good practice on the conduct of legal reviews.

7. Identify guidelines and good practices for militaries to consider using in conducting legal reviews of autonomous weapons systems.

(6) Risk mitigation

1. When developing or acquiring autonomous weapons systems, consider, adopt and implement risk mitigation measures to ensure physical security and appropriate non-physical safeguards as well as to prevent acquisition by terrorists or other unauthorized recipients.

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

(a) Risk assessments should consider the risks, inter alia, of civilian casualties, as well as precautions to help minimize the risk of incidental loss of life, injuries to civilians and damage to civilian objects must be considered. Other types of risks should be considered, as appropriate, including but not limited to the risk of unintended engagements, risk of loss of control of the system, risk of proliferation and risk of acquisition by terrorist groups.

(b) Risk mitigation measures can include 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.

3. Where feasible and appropriate, verifiability and certification procedures covering all likely or intended use scenarios must be developed, the experience of applying such procedures

should be shared bearing in mind national security considerations or commercial restrictions on proprietary information.

4. Prevent the transfer of autonomous weapons systems to unauthorized users, including through the adoption of national measures to regulate production, acquisitions and transfers.

(7) **Operational aspects**

1. Adopt the appropriate legal, administrative and other measures.

2. Exchange national policies, experiences and good practices on a voluntary basis.