



AUTONOMOUS WEAPON SYSTEMS: THE IMPORTANCE OF REGULATION AND INVESTMENT

SUMMARY

The Dutch government asked the Advisory Council on International Affairs (AIV) and the Advisory Committee on Issues of Public International Law (CAVV) to draft an advisory report on the development and use of autonomous weapon systems. The government thus requested an update of the 2015 advisory report *Autonomous Weapon Systems: The Need for Meaningful Human Control*, partly with a view to the five-yearly Review Conference of the United Nations Convention on Certain Conventional Weapons (CCW), to be held in late 2021.

Since 2015, the development and use of autonomous weapon systems have increased significantly internationally. The United States, China and Russia, as well as countries such as Israel, Turkey and South Korea, are actively developing autonomous weapon systems and investing in relevant technologies such as artificial intelligence and robotics. Recent shifts in geopolitical relations have reduced the likelihood of an international consensus on the development and use of autonomous weapon systems. Meanwhile, concerns are increasingly being raised in political and social debates and in legal and ethical reflections regarding the use of autonomous weapon systems, and in particular in reference to the lack of clear regulation.

In this new advisory report the AIV and the CAVV address these developments and debates, and pay specific attention to the concerns over the use of autonomous weapon systems, addressing both the advantages and disadvantages of such use. The AIV and the CAVV thereby answer the government's questions, as set out in the request for advice (see the annexe).

In this advisory report the AIV and the CAVV make a distinction between on the one hand *semi-autonomous* weapon systems that still involve a certain degree of meaningful human control, and on the other hand *fully* autonomous weapon systems where such control is absent. Fully autonomous weapon systems are weapon systems with autonomous functions for the selection and engagement of specific targets, without human involvement.

In this report the AIV and the CAVV take a two-track approach. On the one hand they consistently point to the problematic and high-risk aspects of the development and use of autonomous weapon systems. The alarming technological and geopolitical developments which have caused a rapid increase in the military deployment of semi-autonomous weapon systems over the past six years are compelling governments to consider further regulation of semi-autonomous weapon systems. On the other hand, the AIV and the CAVV see these developments as a cause – for reasons of security and the need for effectively equipped armed forces – to invest in the development, procurement and use of semi-autonomous weapon systems, provided they are regulated.

This advisory report differs on a number of important points from the 2015 report. The most important difference is the emphatic call on the government to speak out in favour of a ban on *fully* autonomous weapon systems. The AIV and the CAVV note that since their previous advisory report on autonomous weapon systems was published in 2015 there has been a significant expansion of activities and investments. Many state and non-state actors are working on the development of artificial intelligence-based weapon systems. The Netherlands should pay continuous attention to these developments in the political, diplomatic, technical and financial fields. To this end, it is necessary for the Netherlands to explicitly speak out in favour of a ban on fully autonomous weapon systems and for the regulation of semi-autonomous weapon systems.

As in their 2015 advisory report, the AIV and the CAVV continue to believe that meaningful human control is essential for compliance with the core rules of international humanitarian law regarding the principles of distinction, proportionality and taking precautionary measures. These rules still apply in full to the use of autonomous weapon systems. Fully autonomous weapon systems that apply machine-learning to interpret rules and select and engage targets without any human involvement or without the possibility of human intervention (and thus without meaningful human control) cannot therefore be used in accordance with existing international law.

Unlike fully autonomous weapon systems, the use of *semi-autonomous* weapon systems could be lawful, provided they are under meaningful human control. The AIV and the CAVV conclude that further regulation is required for the development, procurement and use of semi-autonomous weapon systems. The AIV and the CAVV formulate specific proposals for elaboration of the way meaningful human control should take shape at the various stages of the decision-making process. This is a key difference compared to the recommendations set out in the 2015 advisory report.

In the case of meaningful human control there must in essence be sufficient and effective control by humans who decide on the use of a semi-autonomous weapon. It is important in this respect that they have a minimum cognitive understanding of the information that needs to be processed and the context in which the weapon is to be deployed. In principle this will enable these individuals to make an informed decision on the lawful use of the weapon, in accordance with the criteria regarding distinction, proportionality and precautionary measures.

The AIV and the CAVV recommend making the concept of meaningful human control an integral part of the different stages of the decision-making process – from design and procurement up to and including actual deployment. In addition to the importance of meaningful human control in assessing the international humanitarian law criteria, it is also necessary for those who hold political office and positions of responsibility to be able to indicate how diligent and informed decision-making can take place with respect to the development, procurement and use of semi-autonomous weapon systems. To ensure this, ethical frameworks must be embedded within national and international organisations.

When it comes to exercising control over the deployment of semi-autonomous weapon systems it is important to distinguish between *making* a decision and *implementing* that decision. Central to this is ‘human-machine interaction’; the basic assumption here is that humans understand and can respond to the information concerning the context for deployment and the capabilities and limitations of the machine. In order to develop semi-autonomous weapon systems that involve intensive interaction between human and machine, concepts such as machine ethics and transfer of control need to be taken into consideration.

Safeguarding ethical concepts is essential now that new technologies such as artificial intelligence are increasingly going to influence the nature of warfare. Key geopolitical players and technologically advanced armed forces are investing heavily in the development of new technologies and in the development of semi-autonomous weapon systems. This compels the Netherlands to consider its own position. In order to ensure effectively equipped armed forces and from a security point of view, it is necessary for the Netherlands to have semi-autonomous weapon systems at its disposal. The Netherlands should therefore actively participate in international innovation programmes where advanced technological knowledge and experience can be exchanged. At the same time, the Netherlands should also consider international regulation and standardisation of norms. Within the EU and NATO the Netherlands should seek consensus on the ethical and legal frameworks. The same holds for the activities within the UN, and the Netherlands should specifically aim for further regulation within the context of the CCW.

When developing and deploying semi-autonomous weapon systems it is crucial to make clear where the responsibility lies in the event of unlawful use. Under general international law states can be held responsible for the unlawful actions of autonomous weapon systems that they use, for example when these systems open fire on civilians. Under international criminal law individuals can also be held responsible if they have played a role in the unlawful use and development of a semi-autonomous weapon system at any point during its entire life cycle, in particular developers, commanders and operators.

Due to the relatively high-risk nature of the use of semi-autonomous weapon systems in conflict situations, applying the principle of strict liability to state responsibility - so that liability is based solely on the damage caused - could be considered, particularly in the case of technical failures. In this regard it is irrelevant whether the state was negligent or is in any way culpable; even if the state has met its due diligence obligations it can still be held responsible according to a strict liability regime. States will need to reach agreement to legislate this option of strict liability in the context of state responsibility.

Given the potential for abuse by certain states and non-state actors, the speed of technological developments and the fact that private companies will be playing an increasingly important role in standardisation of norms, the AIV and the CAVV deem further regulation necessary for semi-autonomous weapon systems. This regulation should go beyond the 11 'Guiding Principles' agreed within the UN CCW. It concerns regulation with respect to the development, procurement and use of semi-autonomous weapon systems and the responsibilities held by the actors at the various stages.

The AIV and the CAVV emphasise that there are various options for arriving at further regulation for semi-autonomous weapon systems. Rather than developing new legal standards, it primarily involves making existing legal rules more specific. Fully autonomous weapon systems cannot be deployed under international humanitarian law because they cannot independently apply the principles of international humanitarian law. The AIV and the CAVV henceforth recommend that government make the prohibition on fully autonomous weapon systems arising from existing international humanitarian law an explicit norm.

RECOMMENDATIONS

The AIV and the CAVV call upon the Dutch government to, given recent developments, recognise the urgency of the development, use and regulation of autonomous weapon systems. The government needs to acknowledge the importance of this subject and the potentially high risks involved in the development and use of autonomous weapon systems and take all necessary steps to prioritise this subject and make it a permanent point of attention on the agenda. The AIV and the CAVV take a two-track approach in this advisory report with the aim of placing an emphasis on both regulation and investment. They recommend the following to the government:

1. **Enhance the focus on developments in autonomous weapon systems.** The AIV and the CAVV note that since their previous advisory report was published in 2015 there has been a significant expansion of activities and investments in this field by state and non-state actors. It is crucial that the Netherlands pays continuous and intensive attention in political, diplomatic, technical and financial terms to these developments and pursues further regulation.
2. **Actively pursue a ban on *fully* autonomous weapon systems.** Fully autonomous weapon systems are unable to independently apply the core rules of international humanitarian law. Therefore they cannot be lawfully deployed. The AIV and the CAVV recommend that the government actively pursue the formulation of an explicit prohibition of the development and use of fully autonomous weapon systems arising from existing international humanitarian law. This can be achieved by drafting an Additional Protocol to the United Nations Convention on Certain Conventional Weapons in which it is explicitly codified that development and use of fully autonomous weapon systems is prohibited.
3. **Take a more active role in the development of international regulation for the development, procurement and deployment of *semi-autonomous* weapon systems.** The AIV and the CAVV consider it essential that more clarity be created with respect to the meaning and scope of the criteria applied to development, procurement and use. The current Guiding Principles developed within the CCW and the UN are not concrete enough for this purpose. The AIV and the CAVV recommend that the government explore the possibility of further regulation, including further regulation in an Additional Protocol to the CCW. At international and national level, consultations on this matter between government, the private sector, civil society organisations and research institutes need to be intensified. The Netherlands' position should be prepared in a broad-based and open manner. To this end, structured consultations should be set up between government, the private sector, civil society organisations and research institutes. Limiting development to semi-autonomous weapon systems must be central to this effort.
4. **Call on states to implement or include in their national legislation the obligation to perform weapon reviews arising from article 36 of Additional Protocol I to the Geneva Conventions.** The obligation to publish these weapon reviews can also be included in additional legislation. The AIV and the CAVV advise the government to make a serious effort to strengthen the role of the Advisory Committee on International Law and the Use of Conventional Weapons and to give it a coordinating role in consultations between central government and businesses and scientific institutions.
5. **Continue to adhere to the concept of meaningful human control (MHC) as a basis for the regulation of *semi-autonomous* weapon systems.** In line with their position in 2015, the AIV and the CAVV still firmly hold the opinion that humans must always retain ultimate responsibility for the deployment of a weapon system. A distinction exists between *fully* autonomous and *semi-autonomous* weapon systems. In the case of fully autonomous weapon systems meaningful human control is absent; in the case of semi-autonomous weapon systems

such control is a possibility. This provides the basis for the regulation of semi-autonomous weapon systems. The AIV and the CAVV offer specific proposals for elaboration of the way meaningful human control can be assigned and further defined.

6. **Cooperate with EU partners, the United States, the United Kingdom and other NATO Allies to achieve joint development and production of semi-autonomous weapon systems (in which meaningful human control is effectively assigned), and regulation of export control and investment screening for dual-use technologies.** The AIV and the CAVV stress the importance of new technologies to the organisation and functioning of modern armed forces. This includes the development of semi-autonomous weapon systems, which are crucial to the support and effectiveness of the armed forces. Furthermore, within the EU and NATO the Netherlands should pursue the establishment of platforms where government, knowledge institutions and the private sector can together explore the industrial, legal and ethical aspects of autonomous weapon systems.
7. **Encourage NATO Allies to jointly play a key role in pursuing interoperability and standardisation in the field of disruptive technology and semi-autonomous weapon systems.** This is an essential precondition for effective joint action. The Netherlands should take on a leading role in this respect.
8. **Make the concept of explainable artificial intelligence the basis for Dutch policy when it comes to the development, procurement and use of semi-autonomous weapon systems.** The technologies applied must be explainable at all times. Responsible use requires clarity on where in the chain the decision-making and meaningful human control take place and what responsibilities this entails. The Dutch armed forces must be trained in effective human-machine interaction and on how to use this artificial intelligence.
9. **Make agreements with the private sector and scientific institutions on the development and procurement of semi-autonomous weapon systems.** At the procurement stage developers' efforts to achieve effective human-machine interaction, to reduce automation bias, and to define ethical conditions in the system should be assessed, and thus included in the development phase and in contracts for such development.
10. **Timely update this advisory report.** Lastly, the AIV and the CAVV advise the government to request an update of this advisory report in good time given the pace of technological, military, geopolitical and legal developments. In doing so, the government should evaluate whether the commitment to further international regulation is being achieved and implemented in practice.