
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

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Australia's System of Control and applications for Autonomous Weapon Systems

Submitted by Australia

I. Introduction

1. A central concept under discussion at the Group of Governmental Experts (GGE) meetings on Lethal Autonomous Weapon Systems (LAWS) is the issue of control over LAWS in military conflicts.
2. The concept of control is an important component in any discussion of how weapon systems with autonomous functions could be used by militaries. Noting the discussions to date have not adequately explored the existing ways in which states and militaries apply force, Australia provides this non-paper to explain its own system of control as it would be applied to Autonomous Weapon Systems (AWS), with the aim of stimulating further discussion.
3. Australia argues that a system of control is required for any military use of force, regardless of whether AWS are used. A system of control is an incremental, layered approach to applying control, covering all aspects of a weapon system from design through to engagement. This system is applicable to the full spectrum of weapon systems, including those without, with limited and with near-fully autonomous functionalities. Through a system of control, militaries are able to appropriately ensure that all capabilities, including AWS, operate in a lawful and regulated manner. Many militaries already employ systems of control, in one form or another.
4. As illustrated by this non-paper, if states uphold their existing international law obligations and implement a thorough internal process of regulations, there is no need to implement a specific ban on AWS, at this time.
5. For the purpose of this non-paper; the term 'control' refers to the system of processes and procedures through which a state achieves its intended military effect, in a manner compliant with its legal obligations and policy objectives and; 'AWS' refers to a weapon or weapon system that can undertake combat functionality without further direction.
6. The explanation of the system of control in this paper has been simplified and in practice, may be implemented over the course of decades.



II. The Australian System of Control on the Use of Military Force

7. Australia has a longstanding and well-articulated position on the use of military force. The application of military force is controlled in accordance with Government direction and must be compliant with domestic and international law. To achieve this, Australia implements a system of control. This system incrementally builds upon itself, embedding controls into military processes and capability at all stages of their design, development, training and usage. This ensures that all aspects of the military operate consistently in accordance with Australia's approach towards the use of force.

8. Australia's system of control provides comprehensive control over any weapon system, and how and under what circumstances it can be deployed, ensuring, at its core, the weapon system is driven by human direction and is compliant with international and domestic law.

9. In so far as controlling AWS, the strength of Australia's system of control is that it considers each type of AWS individually - enabling the controls to be tailored to the specific AWS and its unique operating environment. This system recognises and addresses that some types of AWS and some battlespaces will require more human direction or interaction than others.

A. Stage one: Legal and Policy framework

10. The first stage of implementing control in the use of any military weapon system by Australia is embedded in the legal foundations of the Commonwealth of Australia. In accordance with the Commonwealth of Australia Constitution, any use of force undertaken by the military must comply with domestic and international law and Government direction. While Government direction must be in accordance with the law, arguably it must also be in accordance with societal values and customs. This creates the broadest layer of control for any military weapon system that is considered for development, procurement or use by Australia.

B. Stage two: Design and Development

11. The next set of controls are applied during the design and development stage which build upon the legal foundations outlined in stage one.

12. The early phases of design address the scope of the particular weapon system. In the context of an AWS, this would include: identifying broad functions the AWS would be required, and permitted, to employ in different scenarios; how controls and commands are translated into coding; technical and safety requirements; human roles and interactions with the AWS; and establishing limitations and safeguards.

C. Stage three: Testing, evaluation and review

13. Comprehensive **testing and evaluation** is conducted on designs and concepts. This is to ensure the weapon system: meets the defined requirements set in stages one and two; is compliant with control parameters and directions; exhibits reliable performance; is safe and fit for purpose.

14. For an AWS, this would include software verification, performance reliability testing, compliance with commands, and operational permissions and limitations. These tests and evaluations would be conducted for both the system as a whole, as well as its sub-systems.

15. Should the weapon system fail any of the above testing and evaluation or aspects of them, re-designing or re-engineering the system to achieve compliance would be explored. If compliance cannot be achieved, the system would not be utilised or use limitations would be imposed.

16. An important aspect of the review process is an **Article 36 Review**. In accordance with Australia's obligation as a party to *Protocol I Additional to the Geneva Convention*, an Article 36 Review must be undertaken before a new weapon system can be introduced into service. To achieve this, all weapons, means or methods of warfare (collectively referred to as 'weapons') that the Australian Defence Force intends to use in warfare must undergo a legal review before operational use.

17. This review is a legal assessment to determine whether a weapon is (i) cleared, (ii) cleared subject to conditions, or (iii) not cleared for operational use. There are two key elements considered in this review. The first element is whether the weapon or its intended use in combat is consistent with Australia's international legal obligations, including under customary international law. The second element considered -as appropriate- is whether acquiring, developing or adopting the weapon is contrary to the public interest (for instance, is contrary to a legal trend), principles of humanity or the dictates of public conscience. This reflects the application of the Marten Clause, of which Australia takes a narrow view.

18. For more information, please refer to the attached Australian non-paper on Article 36 reviews that was submitted to the GGE on LAWS in August 2018.

19. Stages two and three may occur over the period of years and be repeated multiple times, to ensure compliance with the weapon system's set requirements.

D. Stage four: Acceptance, Training and Certification

20. As a weapon system moves towards acquisition, the focus of control measures shifts from design and development controls to those for governing a weapon system in-service.

21. **Acceptance** is the process where a weapon system is considered, tested and approved for acceptance into service.

22. **Training** is the planned process to inculcate and modify knowledge, skills and attitudes to achieve effective performance in an activity or range of activities. This ensures that the weapon system (both the weapon and the weapon operator) is prepared for specific operations and contingencies and is able to carry them out in accordance with strategic guidance.

23. Training ensures the achievement of an appropriate level of proficiency to correctly perform a task. Any limitations identified during the certification aspect of this stage would be highlighted and incorporated into the training. Additionally, legal requirements and targeting processes are included in this training and are revisited and revised continuously throughout preparation for deployment and while in deployment.

24. **Certification** is the process of assessing a weapon's performance and the technical proficiency of its operators against requisite standards. The certification process confirms that the weapon system performs as required and that the operators and their superiors are appropriately qualified to operate the weapon system. The acceptance, training and certification controls act as 'traffic lights' for a new weapon system.

25. The controls outlined above would be applied to AWS capabilities in the same way as they are currently applied to other in-service capabilities. AWS that are not fit for purpose will not be accepted and therefore, will not receive initial or final operational certification. Were an AWS identified as having capability limitations, (such as limited software or identified interface requirements) consideration would be given to whether those limitations could be addressed through administrative and training controls. If so, the AWS would progress to reduced or conditional operational certification instead. An example of reduced operational certification could be restrictive 'use' documentation (such as 'standard operating procedures' or 'training, tactics and procedures') designed to ensure adherence to appropriate legal, command and policy obligations. AWS identified as fit for purpose with no capability limitations will proceed with a full operational certification.

E. Stage five: Pre-deployment selection

26. Pre-deployment selection takes an accepted weapon system and the controls embedded in its technology, training and certification, and further specifies the controls to address specific use on deployment.

27. The first application of these controls is the decision to use force and/or deploy troops. In accordance with Australia's Constitution, the Australian Government makes this decision which must be consistent with domestic and international law.

28. Once the decision to deploy troops is made, the Government provides strategic guidance and objectives to the Chief of the Defence Force to commence planning or endorses a proposed military response.

29. This planning process considers each weapon system –an AWS or otherwise- and whether it is the most appropriate capability for the operation. This process not only examines whether the weapon system could satisfy mission objectives, but also determines whether it would meet overall Government strategic interests.

F. Stage six: Weapon Use Parameters

30. Weapon use parameters may address additional limitations on when, how, or where a weapon system can be used in operations. These parameters would be used in conjunction with any certification limitations previously identified.

31. Weapon use parameters are unique to each weapon system. A weapon system, including AWS would be assessed and appropriate command and control arrangements, and any other operational restrictions or limitations would be identified and communicated, (normally, through military orders). This control ensures that the weapon system is used appropriately; and that any parameters of its use are communicated clearly to superiors and operators.

G. Stage seven: Pre-deployment certification and training

32. Certain weapon systems require successful pre-deployment certification to be deployed. Unlike operational certification in the acquisition decision phase, pre-deployment certification focuses on the proficiency of commanders and operators assessed against scenarios specific to the planned mission. Included in this process is another revision of the operators and commander's legal and policy obligations, such as international humanitarian law and targeting processes.

33. Should a weapon system, such as an AWS (and their operators), pass this pre-deployment certification process, the AWS would be certified for inclusion as a part of the deployable force.

H. Stage eight: Strategic and military controls for use of force

34. The final stage of controls before any weapon system is used are the strategic and military controls for the use of force. These controls further refine the engagement any weapon system or operator can perform. Specifically, this includes who and what can be targeted, and where and how it can be targeted. These decisions are made based on national objectives and legal obligations. Due to the significance of these decisions and their consequences, the Chief of the Defence Force requires visibility and control of the Australian Defence Force targeting process. This usually results in the Chief of the Defence force setting the use of force parameters, which are considered and approved by the Australian Government.

35. These parameters are implemented primarily through rules of engagement orders and targeting directives, which are developed through the **Australian Defence Force targeting process**. This process selects and prioritises targets and matches them to their appropriate

effect and then tasks the lethal and/or non-lethal means by which action is taken against those targets, to achieve the desired effects. The targeting process links intelligence, plans, and the operation as part of the broader planning and evaluation process that enables superiors to continuously update and assess the progress of operations.

36. **Rules of engagement** explicitly define the circumstances, conditions, degree, and manner for the use of all force including targeting or tactical engagements. **Targeting directives** (at the very minimum) set; the list of targetable objects and persons; necessary authorisations and limitations on targeting, targeting command, control and oversight arrangements; legal limitations; the responsibilities of supporting agencies; national policies on legal issues affecting targeting; and adoption of key decision-making processes (such as the requirement to use the collateral damage estimation methodology).

37. Inherent to the system of control, is that no weapon system or operator is able to target or make the decision to action a target without following a comprehensive and regimented targeting and authorisation process. Just like any other weapon system or operator, an AWS would need to be able to comply with the directions of the rules of engagement and targeting directives to be authorised to undertake any targeting or engagement.

38. This is in addition to any other orders or controls such as risk management and communication procedures or parameters of use.

I. Stage nine: After-action evaluation

39. To further assure compliance and safety, after-action evaluation is applied to all weapon systems. This evaluation assesses how a weapon system performed, if it performed as expected and if remedial action was required. This would include but is not limited to: a battle damage assessment; operational reporting; post-mission analysis; incident inquiry; explosive remnants of war compliance; and weapon checks and maintenance.

40. This stage operates as a feedback loop to all prior stages of control, allowing for retrospective evaluation of the weapon system, such as an AWS, which could result in re-testing, re-training, re-certification or a narrowing or widening of permissions and limitations.

III. Conclusion

41. If states abide by similar systems of control to that of the Australian system of control, (consistent with IHL), states' militaries should be able to appropriately ensure that all weapon systems, including AWS, will operate in a lawful and deliberate manner without the need for a specific ban, at this time.

42. It is also clear from this non-paper that the phrase 'human control' as used by some in the GGE discussions does not adequately cover the plethora of practical controls or systems utilised by states and their militaries, such as Australia's system of control. Accordingly, the phrase does not provide a useful basis to further GGE discussions unless there were a common understanding of the term.

43. To advance GGE discussions, Australia provides this non-paper and the model of 'System of Control' to further understanding and discussions on the development and use of AWS.

System of Control

After-action evaluation feedbackloop
(on a needs basis)

