

致命自主武器系統規範爭議的探討與 展望

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摘要

致命自主武器系統 (Lethal Autonomous Weapon Systems, LAWS) 被視為是軍事事務中的重要面向，但 LAWS 能否有效遵循國際人道法與應如何建構合適國際規範，引發許多辯論。本文認為，當前趨勢是「有限度的技術治理」，而非以道德共識為基礎的全面禁用。理由是支持 LAWS 的主張更能與國家的現實需求結合，而國家亦會透過適當性與結果性邏輯賦予 LAWS 政策上的正當性。因此，關於 AI 軍事化應用之相關規範建構，最終也可能須從實踐經驗來形塑國家間共識。

關鍵詞：AI 軍事化應用、致命自主武器系統、自動化武器系統、
聯合國政府間專家組、AI 獨角獸企業

An Analysis and Outlook on the Regulation of Lethal Autonomous Weapon Systems

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Abstract

Lethal autonomous weapon systems (LAWs) have become an important issue in military affairs. Whether LAWs can effectively comply with international humanitarian law and how appropriate international norms should be developed remain subjects of considerable debate. This article argues that the current trajectory is toward “limited technological governance,” rather than a comprehensive ban grounded in moral consensus. This is because arguments in support of LAWs align more closely with states’ practical needs, while states also legitimize policies concerning the development and use of LAWs through the logics of appropriateness and consequences. Accordingly, norms governing the military application of AI may ultimately need to be shaped by practical experience to build consensus among states.

Keywords: AI Military Applications, Lethal Autonomous Weapons Systems, Automated Weapon Systems, United Nations Group of Governmental Experts, AI Unicorns

壹、前言

隨技術發展，AI 應用在軍事領域的範圍已開始從科幻式想像，逐漸成為可行的發展路線，使具備 AI 特徵的武器系統成為戰場上的新行為者 (new agents on the battlefield)。¹ 此類應用通常稱為致命自主武器系統，是 AI 軍事化應用中的重點項目，通常被認為能在枯燥、骯髒與危險的 3D 任務中 (dull, dirty, dangerous tasks) 取代人力；具備絕對命令服從性，並不受情緒、體能、偏見影響。²

然而，這種新行為者，也衝擊戰爭乃人類專屬活動的思想基礎 (war as a human thing)，³ 更使約束人類戰爭中行為的國際法規，出現未能涵蓋的究責空缺 (Accountability Gap)，進而引發辯論。本文以 AI 軍事化應用辯論的爭議與國際上嘗試建立相關規範的平台為出發點，述明爭議的不同觀點與規範難以建立之緣由，並展望未來發展。

貳、LAWs 的概念界定與定義爭議

致命自主武器系統 (Lethal Autonomous Weapons Systems，下稱 LAWs)，又稱 AWS、Killer Robot、Lethal Autonomous

¹ Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective* (Cambridge, MA: Cambridge University Press, 2022), p. 118.

² Rebecca Crotoft, "War Torts: Accountability for Autonomous Weapons," *University of Pennsylvania Law Review*, Vol. 164, No. 6 (May 2016), p. 1372.

³ Christopher Coker, *Warrior Geeks: How 21st-Century Technology is Changing the Way We Fight and Think About War* (New York: Oxford University Press, 2013), p. 12.

Robots、Slaughterbots 等，泛指在人類監督範圍外，自主進行目標辨識、選擇與執行攻擊決策的武器系統。

不同國家與組織對其稱呼及定義不一，如美軍在《3000.09 指令：自主化武器系統》（下稱 3000.09 指令）中使用 AWS 一詞，並將其界定為「一旦被啟動後，能在無操作人員進一步介入的情況下，自主選擇並攻擊目標的武器系統」。⁴ 而紅十字國際委員會 (International Committee of the Red Cross, ICRC) 將其界定為「在沒有人類介入的情況下，選擇並攻擊（亦即，對其施加武力）一個或多個目標的武器系統」。⁵ 國際人權觀察組織 (Human Rights Watch, HRW) 則認為 AWS 是被啟動後，依靠感測器而非人為輸入來選擇與攻擊目標的武器系統。⁶ 聯合國大會則於 2023 年 A/RES/78/241 決議中採 LAWs 一詞，⁷ 但聯合國秘書長亦指出，目

⁴ U.S. Department of Defense, *DoD Directive 3000.09: Autonomy in Weapon Systems*, January 25, 2023, p. 21, <<https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf>>.

⁵ ICRC, *Autonomous Weapon Systems and International Humanitarian Law: Selected Issues*, position paper, December 2025, p. 6, <https://www.icrc.org/sites/default/files/2026-03/4896_002_Autonomous_Weapons_Systems_-_IHL-ICRC.pdf>。而所謂無人類介入，係指「在人類啟動該武器系統後，武力的行使即由該系統依據感測器所接收的環境資訊自行觸發。這些感測器可測量熱、光、移動、形狀、速度、重量，以及聲學或電磁訊號等現象；系統則以概括性的「目標輪廓」作為判斷基礎，例如某一類軍事車輛的形狀、紅外線或雷達「特徵」、速度與方向等。」

⁶ Human Rights Watch and International Human Rights Clinic at Harvard Law School, *A Hazard to Human Rights: Autonomous Weapons Systems and Digital Decision-Making* (New York: Human Rights Watch, 2025), p. 6.

⁷ United Nations General Assembly, *Lethal Autonomous Weapons Systems*, A/RES/78/241, December 28, 2023, p. 2, <<https://docs.un.org/en/A/RES/78/241>>.

前尚無國際一致認可的定義，使用該詞亦不影響各國的用語偏好。⁸

由於當前針對此議題進行的國際討論場域中，最權威與最悠久之場域當屬「聯合國特定常規武器公約政府間專家工作組」（Convention on Certain Conventional Weapons-Group of Governmental Experts on Lethal Autonomous Weapons Systems, GGE on LAWs，下稱 GGE），本文採 LAWs 一詞，並依序說明其名稱爭議、與其他武器系統的差異及本文的概念性定義。

一、LAWs 名稱、內涵之分歧與「描述」型定義

LAWs 的爭議涉及「致命」與「自主性」的判斷標準。就「致命」而言，盧森堡指出，自主武器不限於致命用途，沿用 LAWs 可能限縮規範範圍，排除其他應規範的系統。芬蘭與巴勒斯坦則認為，非以致命為設計目的的武器仍可能造成死亡，故「致命」應依攻擊效果 (effect)，而非設計上的固定特徵 (design feature) 判定。⁹ 換言之，是否保留「致命」(Lethal)，取決於各國對規範範圍與內涵的不同理解。¹⁰

⁸ United Nations General Assembly, *Lethal Autonomous Weapons Systems: Report of the Secretary-General*, A/79/88, July 1, 2024, pp. 5-6, <[https://docs-library.unoda.org/General_Assembly_First_Committee_-_Seventy-Ninth_session_\(2024\)/A-79-88-LAWS.pdf](https://docs-library.unoda.org/General_Assembly_First_Committee_-_Seventy-Ninth_session_(2024)/A-79-88-LAWS.pdf)>.

⁹ GGE on LAWs, *Compilation of Replies Received to the Chair's Guiding Questions*, Convention on Certain Conventional Weapons, CCW/GGE.1/2024/CRP.1, August 12, 2024, pp. 6, 8, 10, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2024\)/CCW_GGE1_2024_CRP1.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2024)/CCW_GGE1_2024_CRP1.pdf)>.

¹⁰ 例如，自主基地防衛系統即使僅使用橡膠子彈、催淚瓦斯、強光、聲波或電擊，仍因可自主選擇目標並施加武力而具有規範必要。且非致命設

至於「自主」(Autonomous)，亦有分歧。因為同一武器系統同一系統在移動、搜索、識別及使用武力等任務階段，可能具有不同程度的自主性，且技術持續演進，也使固定標準難以建立。¹¹

現行較常引用的 LAWs 自主性判斷標準，源自 HRW 於 2012 年發布的《Losing Humanity: The Case against Killer Robots》。多赫提 (Bonnie Docherty) 依人類對決策迴路的控制程度進行分類（見表 1），將無人類輸入，或人類角色有限至實際「脫離迴路」的系統，稱為「完全自主武器」(Fully Autonomous Weapons, FAW)。¹² 此分類雖有爭議，仍因以人類介入程度為標準而廣受引用。

表 1：LAWs 人機互動模式分類

人類在迴圈內 Human-in-the-Loop	僅在獲得人類指令的情況下，機器人方可選擇目標並施加武力之武器系統。
人類在迴圈上 Human-on-the-Loop	機器人可自主選擇目標並施加武力，但處於人類操作員的監督之下，且人類可對其行動進行介入或覆寫 (override)。
人類在迴圈外 Human-out-of-the-Loop	機器人能夠在無任何人類輸入或互動的情況下 (without any human input or interaction)，自主選擇目標並施加武力之武器系統。

資料來源：翻譯整理自作者依 Bonnie Docherty, *Losing Humanity: The Case against Killer Robots*, Human Rights Watch, November 19, 2012, <<https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots>>.

計未必產生非致命結果：橡膠子彈近距離擊中要害、催淚瓦斯用於密閉空間，或強光導致車輛失控，均可能致死。因此，「致命」不應僅依設計特徵判定，也應考量具體使用情境及其效果。

¹¹ 持此觀點的代表性國家分別為愛沙尼亞與日本，詳見 GGE on LAWs, *Compilation of Replies Received to the Chair's Guiding Questions*, pp. 6, 8.

¹² Bonnie Docherty, *Mind the Gap: The Lack of Accountability for Killer Robots*, Human Rights Watch and Harvard Law School International Human Rights Clinic, April 2015, p. 6, <https://www.hrw.org/sites/default/files/reports/arms0415_ForUpload_0.pdf>.

由於各國對 LAWs 的名稱、內涵與技術判準仍存分歧，且可能隨技術演進而變動，GGE 目前僅能以「滾動文件」(rolling text) 形式，將 LAWs「描述」為 (characterized as)「一個或多個武器和技術部件的整合組合，該系統能選擇和接戰目標，在執行這些任務時無需人類介入。」¹³

二、自動化系統、防空系統、無人載台與 LAWs

前述定義均以系統能否在無人類介入下選擇與接戰目標為核心。然而，具備自動化或部分自主功能的武器，並不當然屬於 LAWs。為釐清其差異，以下分別比較自動化系統、防空系統與無人載台。

(一) 自動化系統與 LAWs

自動化系統 (Automated Systems) 依預設程式與規則，對感測輸入作出機械式反應；當其規則已知時，則通常可以預測輸出。¹⁴ 此類系統難以處理規則以外的偏差輸入，¹⁵ 例如地雷或

¹³ GGE on LAWs, *Revised Rolling Text as of 12 May 2025*, Convention on Certain Conventional Weapons, May 12, 2025, p. 1, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2025\)/Revised_rolling_text_as_of_12_May_2025.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2025)/Revised_rolling_text_as_of_12_May_2025.pdf)>.

¹⁴ Vincent Boulanin, *Mapping the Development of Autonomy in Weapon Systems: A Primer on Autonomy* (Stockholm: Stockholm International Peace Research Institute, 2016), pp. 3-4, <<https://www.sipri.org/sites/default/files/Mapping-development-autonomy-in-weapon-systems.pdf>>.

¹⁵ Defense Science Board, *Report of the Defense Science Board Summer Study on Autonomy* (Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, 2016), p. 4, <<https://irp.fas.org/agency/dod/dsb/autonomy-ss.pdf>>.

水雷，¹⁶ 僅能依固定條件作出反應，無法進行「裁量性決策」(discretionary decisions)，¹⁷ 故不屬於 LAWs。

(二) 防空系統與 LAWs

防空系統通常設有手動接戰 (Manual mode) 與自動接戰 (Automatic mode)。手動模式由操作員授權發射並管理交戰，屬「人在迴路內」(Human-in-the-Loop)。美軍 2023 年版《3000.09 指令》將此類人類主導接戰的系統界定為半自主武器系統 (semi-autonomous weapon systems)，即啟動後僅攻擊操作員選定的個別或特定目標群體，包括「射後不理」(fire and forget) 與「發射後鎖定」(lock-on-after-launch) 的自導彈藥 (homing munitions)。¹⁸ 但無論名稱為何，都顯示人類對交戰與攻擊目標的控制權。¹⁹

自動接戰模式則依預設參數偵測並攻擊目標；操作員僅能在限定時間內否決攻擊 (time-restricted veto)，故屬「人在迴路上」

¹⁶ 例如地雷觸壓引爆的磅數設定等固定參數。

¹⁷ Markus Wagner, "The Dehumanization of International Humanitarian Law: Legal, Ethical, and Political Implications of Autonomous Weapon Systems," *Vanderbilt Journal of Transnational Law*, Vol. 47 (2014), p. 1383.

¹⁸ U.S. Department of Defense, DoD Directive 3000.09: *Autonomy in Weapon Systems*, January 25, 2023, p. 23, <<https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf>>.

¹⁹ 「射後不理」與「發射後鎖定」雖看似脫離人類控制，實則仍受人類預先決定。前者由操作員於發射前指定目標，武器僅負責後續導引；後者雖可透過主動感測器搜尋目標，或被動接收熱源、雷達等外部訊號，但其訊號類型、目標特徵、搜索區域與交戰條件，仍由人類預設。故此類武器雖具一定自主性，目標選定仍源於人類指令或辨識參數，本質上仍屬人類意志延伸。詳可參閱 Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective* (Cambridge, MA: Cambridge University Press, 2022), pp. 91-96.

(Human-on-the-Loop)。²⁰《3000.09 指令》將此模式界定為「操作員監督之自主武器系統」(operator-supervised autonomous weapon systems)，即操作員可介入並中止交戰，並在系統故障或造成不可接受之損害前中止攻擊。²¹

因此，「半自主」與「操作員監督型自主」的差異在於：前者在「尋找、定位、追蹤、瞄準、交戰與評估」(find, fix, track, target, engage and assess, F2T2EA)擊殺鏈中，保有操作員的「瞄準與交戰權」(operator control is retained)；²²而後者則在脫離人類控制下選擇並攻擊目標(select and engage targets without human intervention)。²³換言之，「瞄準與交戰」被獨立於人類控制之外，²⁴但人類仍可在攻擊行動完成前予以中止。²⁵

²⁰ Ingvild Bode and Hendrik Huelss, *Autonomous Weapons Systems and International Norms* (Montreal, Canada: McGill-Queen's University Press, 2022), pp. 169-170, 183.

²¹ U.S. Department of Defense, *DoD Directive 3000.09: Autonomy in Weapon Systems*, January 25, 2023, p. 22, <<https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf>>.

²² *Ibid.*, p. 23.

²³ Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective* (Cambridge, MA: Cambridge University Press, 2022), p. 93.

²⁴ Peter Asaro, "On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making," *International Review of the Red Cross*, Vol. 94, No. 886 (Summer 2012), pp. 694-695.

²⁵ Paul Scharre and Michael C. Horowitz, *An Introduction to Autonomy in Weapon Systems*, working paper (Washington, DC: Center for a New American Security, February 2015), p. 16.

然而，自動接戰系統仍依人類預設的參數與功能運作，無法任意改變目標類型。例如，防空系統的攻擊對象限於來襲飛行物，不會自行轉向地面或海面目標。因此，其作用範圍與可能結果仍可預先掌握，與可自主辨識及攻擊不同目標，且不保留人類介入空間的 LAWs 有所差異。

（三）無人載台與 LAWs

《3000.09 指令》將人員操控的無人載台稱為「遙控載台」(Remotely Operated Platform)，即由未身處平台內的人員主動控制的空中、陸地、水面、水下或太空載台。²⁶ 此類載台實質上仍是由人類控制的飛行器 (remotely piloted aircraft)，²⁷ 或轟炸機 (remotely piloted bombers)，²⁸ 依人類指令攻擊特定目標，故不同於自主辨識並攻擊目標的 LAWs。

三、LAWs 的概念性定義

綜合上述比較可知，自動化武器依預設規則反應，無人載台由人類遙控，防空系統即使自動接戰，亦受預設目標與功能限制。三者雖具不同程度的自動化或自主功能，仍屬人類意志的延伸，其攻擊對象、作用範圍及可能結果基本上可由人類掌握。

²⁶ U.S. Department of Defense, *DoD Directive 3000.09: Autonomy in Weapon Systems*, p. 22.

²⁷ Bill Boothby, *AI Warfare and the Law* (Newport, RI: Stockton Center for International Law, 2025), p. 259.

²⁸ Rebecca Crotoft, "War Torts: Accountability for Autonomous Weapons," p. 1367.

GGE 的「描述」型定義著重於武器系統選擇與接戰目標的自主程度，²⁹ 足以說明 LAWs 與自動化武器、遠端操作系統或防空系統的差異，故可稱為技術導向型定義，卻難以充分涵蓋 LAWs 的倫理與法律爭議。

相較之下，LAWs 之所以引發爭議，在於其概念上具有一定不可預測性，可能在超出人類對攻擊對象、作用範圍與結果之預期與掌握下自行運作。因此，包含法國、³⁰ 德國、³¹ 荷蘭、³² 中國大陸、³³ 英國，³⁴ 均曾表達相關擔憂。

²⁹ 一個或多個武器和技術部件的整合組合，該系統能選擇和接戰目標，在執行這些任務時無需人類介入。

³⁰ Mariarosaria Taddeo and Alexander Blanchard, “A Comparative Analysis of the Definitions of Autonomous Weapons Systems,” *Science and Engineering Ethics*, Vol. 28, Article 37 (2022), p. 6.

³¹ GGE on LAWs, Compilation of Replies Received to the Chair’s Guiding Questions, Convention on Certain Conventional Weapons, CCW/GGE.1/2024/CRP.1, August 12, 2024, p. 20, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2024\)/CCW_GGE1_2024_CRP1.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2024)/CCW_GGE1_2024_CRP1.pdf)>.

³² United Nations General Assembly, *Lethal Autonomous Weapons Systems: Report of the Secretary-General*, A/79/88, July 1, 2024, p. 77, <[https://docs-library.unoda.org/General_Assembly_First_Committee_-_Seventy-Ninth_session_\(2024\)/A-79-88-LAWS.pdf](https://docs-library.unoda.org/General_Assembly_First_Committee_-_Seventy-Ninth_session_(2024)/A-79-88-LAWS.pdf)>.

³³ China, “Position Paper,” Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), CCW/GGE.1/2018/WP.7, April 11, 2018, p. 1, <<https://docs.un.org/en/CCW/GGE.1/2018/WP.7>>.

³⁴ Mariarosaria Taddeo and Alexander Blanchard, “A Comparative Analysis of the Definitions of Autonomous Weapons Systems,” *Science and Engineering Ethics*, Vol. 28, Article 37 (2022), p. 8.

此種不可預測性，引發倫理、法律與政治經濟問題。倫理上，機器是否應在缺乏即時人類判斷下行使致命武力；法律上，則涉及 LAWs 能否符合國際法對區分、比例、必要性與責任之要求；政治經濟上，國家追求戰略優勢可能加速 AI 軍事化，並透過國防採購、研發合作與安全需求，促使大型科技企業調整既有的倫理限制。換言之，國家可能為技術優勢淡化倫理與法律考量，企業亦可能受資金、技術、政府市場與競爭誘因吸引而向軍事應用靠攏。

因此，僅將 LAWs 界定為「能自主選擇並接戰目標的武器系統」，不足以涵蓋其規範與政治意涵。本文所稱 LAWs，係指「在啟動後，能藉由感知器與程式獨立偵測、識別、選擇並執行攻擊決策，且因設計上未提供人類即時介入空間，而使其能否遵循國際法仍處未知狀態的武器系統。」此一定義除掌握技術特徵，也呈現 LAWs 與倫理、法律、戰略競爭、軍工企業及技術發展間的相互嵌合，而非單純技術問題。因此從概念型定義出發，較能反映該議題的複雜性。

參、LAWs 國際規範機制的發展與困境

一、國際規範機制與 GGE 的形成

前述不可預測性不僅構成技術與規範問題，也讓 LAWs 逐步進入國際安全治理議程。相較於冷戰時期核嚇阻之不穩定性源於決策者與對手互動中的心理因素，AI 時代的不確定性則可能來自

程式設計本身，³⁵ 使 AI 自主引發的併發問題受到關注。³⁶

相關討論除見於學界，也延伸至國際論壇，如荷蘭主導的「軍事領域負責任使用人工智慧峰會全球委員會」(Global Commission on Responsible Artificial Intelligence in the Military Domain, GC REAIM)；美國倡議的「負責任軍事使用人工智慧與自主性政治宣言」(Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy)；與「聯合國特定常規武器公約政府間專家工作組」(Convention on Certain Conventional Weapons-Group of Governmental Experts on Lethal Autonomous Weapons Systems, GGE on LAWs)。

其中，GGE on LAWs（下稱 GGE）是最重要的國際商議機制，其源自聯合國特別報告員海恩斯 (Christof Heyns) 在 2013 年的報告；該報告將此類技術稱為「致命自主機器人技術」(Lethal Autonomous Robotics, LARs)，並建議成立高級別專家組 (High Level Panel on LARs)，探討其用於武裝衝突時的國際法問題。³⁷ 此後，聯合國在《特定常規武器公約》(CCW) 架構下召開多次非

³⁵ Steven D. Sacks, "A Framework for Lethal Autonomous Weapons Systems Deterrence," *Joint Force Quarterly*, No. 110 (3rd Quarter 2023), National Defense University Press, <<https://ndupress.ndu.edu/Media/News/News-Article-View/Article/3447193/a-framework-for-lethal-autonomous-weapons-systems-deterrence/>>.

³⁶ Toni Erskine and Steven E. Miller, "AI and the Decision to Go to War: Future Risks and Opportunities," *Australian Journal of International Affairs*, Vol. 78, No. 2 (2024), pp. 135-147.

³⁷ Christof Heyns, "Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions," United Nations General Assembly, April 9, 2013, <<https://undocs.org/A/HRC/23/47>>.

正式會議，並於 2016 年第五次締約國審查會議決議成立不限成員名額 (open-ended) 的 GGE，³⁸ 專責討論 LAWs。GGE 最初獲得 2017 至 2021 年的授權，並於第六次締約國審查會議後延續。³⁹

GGE 之目的在於就 LAWs 可能引發的議題開展國家間討論，並探索在 CCW 架構下制定第六議定書 (Protocol VI) 的可能性。⁴⁰ 然而，GGE 迄未完成任務，而新一輪 AI 夏天已使 LAWs 更具技術可行性，也提高國際規範的迫切性。例如，聯合國 2024 年通過的《未來契約》(The Pact for the Future) 即呼籲 GGE 制定「不預先斷定其性質的文書」(an instrument, without prejudging its nature)，以因應此新興領域。⁴¹

二、GGE 的規範進展與政治困境

實際上，採共識決機制的 GGE 回應上述呼籲的前景卻並不樂觀。由於各國對 LAWs 的用詞、定義與範疇仍缺乏共識，

³⁸ CCW, “*Final Document of the Fifth Review Conference of the High Contracting Parties to 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*,” December 23, 2016, CCW/CONF.V/10. <<https://docs.un.org/en/CCW/CONF.V/10>>.

³⁹ CCW, *Final Document of the Sixth Review Conference of the High Contracting Parties to 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*, April 27, 2022, CCW/CONF.VI/11. <https://digitallibrary.un.org/record/3981774/files/CCW_CONF.VI_11-EN.pdf>.

⁴⁰ Marco Sassòli, *Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified*, International Law Studies, Vol. 90 (2014), p. 309.

⁴¹ United Nations, “The Pact for the Future (A/RES/79/1),” September 22, 2024, <<https://docs.un.org/en/A/RES/79/1>>.

使 GGE 成立以來雖取得部分階段性成果，卻始終未能促成規範制定。例如，2019 年 GGE 通過 LAWS「指導原則」(Guiding Principles)，⁴² 但各國對其意義仍有分歧。美國認為該原則足以引導各國負責任地研發與使用 LAWS；⁴³ 不具 LAWS 研發能力的國家如葡萄牙則主張，應持續檢視現行國際法以辨識可能的規範缺口 (find possible gaps)，並探索新議定書的可能性。⁴⁴

2023 年，阿根廷等十四國聯合提出《自主武器系統議定書草案》(Draft Protocol on Autonomous Weapon Systems)；⁴⁵ 美國等七國則另提草案，並強調其「既不創設任何法律義務，亦不授權減損任何法律義務」(draft articles neither create, nor authorize derogation from, any legal obligation)。⁴⁶ 最終，美國提案獲納入年

⁴² GGE on LAWS, *Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, CCW/GGE.1/2019/3, Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, Geneva, September 25, 2019, Annex IV, <<https://docs.un.org/en/CCW/GGE.1/2019/3>>.

⁴³ United States, *U.S. Commentaries on the Guiding Principles*, Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), 2020, <<https://documents.unoda.org/wp-content/uploads/2020/09/20200901-United-States.pdf>>.

⁴⁴ Portugal, *Commentaries by Portugal on Operationalising All Eleven Guiding Principles at a National Level*, Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), 2020, <<https://documents.unoda.org/wp-content/uploads/2020/09/20200831-Portugal1.pdf>>.

⁴⁵ CCW, “Draft Protocol on Autonomous Weapon Systems (Protocol VI) (CCW/GGE.1/2023/WP.6),” *United Nations*, May 11, 2023, <<https://docs.un.org/en/CCW/GGE.1/2023/WP.6>>.

⁴⁶ CCW, “Draft Articles on Autonomous Weapon Systems-Prohibitions and Other Regulatory Measures on the Basis of International Humanitarian Law (‘IHL’) (CCW/GGE.1/2023/WP.4/Rev.2),” *United Nations*, May 15, 2023,

度總結報告，阿根廷等國的聯合工作文件卻未被收錄，⁴⁷ 這顯示 LAWs 規範制定的困境實際上可能是政治問題而非技術問題。

肆、LAWs 規範爭議的主要觀點

GGE 的困境顯示，LAWs 規範建構的困難不只來自制度設計，也來自各國對其法律、倫理與軍事效益的不同判斷。國家原則上偏好在軍事上取得先手優勢 (first-mover advantage)，但追求技術的同時也會影響戰爭中的道德判斷，使觀念出現競爭。學界因此分為反對、支持與反思三類觀點，以下分述之。

一、反對 LAWs 的觀點

(一) 反對派的主張

反對派主要從道德、哲學、國際法與技術限制等面向批判 LAWs，並主張全面禁止其研發與使用。代表人物包括阿特曼 (Jürgen Altmann)、阿薩羅 (Peter Asaro)、多赫提 (Bonnie Docherty)、夏基 (Noel Sharkey) 與史派羅 (Robert Sparrow)；相關組織則包括國際機器人軍備管控委員會 (International Committee

<<https://docs.un.org/en/CCW/GGE.1/2023/WP.4/Rev.2>>.

⁴⁷ CCW, “Report of the 2023 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems (CCW/GGE.1/2023/CRP.2),” *United Nations*, May 12, 2023, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2023\)/CCW_GGE1_2023_CRP.2_12_May.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2023)/CCW_GGE1_2023_CRP.2_12_May.pdf)>.

for Robot Arms Control)、⁴⁸ 人權觀察組織 (HRW)、⁴⁹ 禁止殺手機器人運動 (Stop Killer Robots)、⁵⁰ 其主張大致相近。

史派羅以兒童為喻說明 LAWs 的究責困境：兩者雖具自主性，卻缺乏完整道德能力，無法為行為負全責；但若將責任轉嫁予設計者，又可能要求其為無法預測的自主行為負責，如同要求父母承擔成年子女的責任。⁵¹ 反對者據此認為，演算法驅動的 LAWs 並非真正的道德主體，最多只是模擬道德的「道德殭屍」(Moral Zombies)，不應將政治哲學中豐富的自主性概念，與科技語境下較寬鬆的自主性混淆。⁵² 由於 LAWs 缺乏道德能動性 (moral agency) 與獨立意圖 (independent intentionality)，一旦於武裝衝突中出錯，便難以實現有意義的究責 (meaningful accountability)。⁵³ 此外，機器無法感知生命的意義與價值，因此不應被授權剝奪人命。⁵⁴

⁴⁸ ICRAC, "About ICRAC," *International Committee for Robot Arms Control*, <<https://icrac.net/about-icrac/>>.

⁴⁹ Human Rights Watch, "Killer Robots," *Human Rights Watch*, <<https://www.hrw.org/topic/arms/killer-robots>>.

⁵⁰ Stop Killer Robots, "Our Policy Position," *Stop Killer Robots*, <<https://www.stopkillerrobots.org/our-policies/>>.

⁵¹ Robert Sparrow, "Killer Robots," *Journal of Applied Philosophy*, Vol. 24, No. 1 (2007), pp. 73-74.

⁵² Carissa Véliz, "Moral Zombies: Why Algorithms Are Not Moral Agents," *AI & SOCIETY*, Vol. 36, No. 2 (June 2021), p. 490.

⁵³ Bonnie Docherty, *Mind the Gap: The Lack of Accountability for Killer Robots*, Human Rights Watch, April 2015, p. 24, <<https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots>>.

⁵⁴ Peter Asaro, "On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making," *International Review of the Red Cross*, Vol. 94, No. 886 (2012), p. 708.

此派觀點還認為，LAWs 的開發與使用終將造成究責缺口 (accountability gap)。首先，武裝衝突中的戰爭罪主要受《國際刑事法院羅馬規約》(Rome Statute of the International Criminal Court) 規範，但該規約僅管轄自然人 (natural persons)，⁵⁵ 故 LAWs 無法成為國際刑事責任主體。即使賦予其法律人格，以施加痛苦為效果的傳統刑罰，也無法對機器產生相類作用，⁵⁶ 這使得追究 LAWs 責任對任何司法體系而言，根本上都是自我矛盾的 (fundamentally self-defeating for any justice system)。⁵⁷

另方面，即使轉而追究部署 LAWs 的軍事指揮官或開發者之間接責任，⁵⁸ 實務上仍有困難。指揮官責任要求其在下屬犯下「可起訴的刑事罪行」(criminal and chargeable offense) 時予以阻止或懲罰，⁵⁹ 下達命令後，除須確保命令的傳達外，亦需在執行命令的過程中保有對下屬的「實質控制力」(effective control)。⁶⁰

⁵⁵ *Rome Statute of the International Criminal Court*, adopted July 17, 1998, entered into force July 1, 2002, Art. 25(1), <https://www.icc-cpi.int/sites/default/files/2024-05/Rome-Statute-eng.pdf> (accessed May 16, 2026).

⁵⁶ Robert Sparrow, "Killer Robots," *Journal of Applied Philosophy*, Vol. 24, No. 1 (2007), pp. 71-72.

⁵⁷ Kjølv Egeland, "Lethal Autonomous Weapon Systems under International Humanitarian Law," *Nordic Journal of International Law*, Vol. 85, No. 2 (2016), p. 110.

⁵⁸ 指揮官責任主要係羅馬規約第 28 條所述之規範。 *Rome Statute of the International Criminal Court*, adopted July 17, 1998, entered into force July 1, 2002, Art. 28, <<https://www.icc-cpi.int/sites/default/files/2024-05/Rome-Statute-eng.pdf>>.

⁵⁹ Rebecca Crotoft, "War Torts: Accountability for Autonomous Weapons," p. 1378.

⁶⁰ Bonnie Docherty, *Mind the Gap: The Lack of Accountability for Killer Robots*, Human Rights Watch and Harvard Law School International Human Rights

若指揮官對即將發生的違規行為具有實際或推定知情 (actual or constructive knowledge),⁶¹ 卻未加預防, 則可能對下屬罪行負間接刑事責任 (indirectly criminally liable for a subordinate's crime)。⁶²

但反對派認為, 指揮官與下屬間的關係始終是「人際關係」,⁶³ 即使賦予 LAWs 法律人格並視為「下屬」(subordinates), 指揮官仍難在既有責任體制下承擔責任, 因為 LAWs 並非自然人, 也缺乏道德判斷能力與法理上的「犯罪意圖」(mens rea), 無法構成「可起訴的刑事罪行」。其次, 何謂對 LAWs 行使有效的「實質控制力」亦難以釐清。若 LAWs 被界定為啟動後可脫離人類控制、自行選擇並攻擊目標, 且排除人類干預的武器, 則其本質上即不可控, 自難以「應控制而未控制」為由追究指揮官責任。第三, 前南斯拉夫國際刑事法庭 (The International Criminal Tribunal for the former Yugoslavia, ICTY) 判例指出, 指揮官若透過書面或口頭報告得知下屬的訓練、教育、情緒或飲酒等一般性資訊 (general information), 即可認定其「有理由知悉」(had reason to know) 下屬可能違法, 並具備實際或推定知情。⁶⁴ 然而, LAWs

Clinic, April 2015, p. 24, <https://www.hrw.org/sites/default/files/reports/arms0415_ForUpload_0.pdf>.

⁶¹ Ibid., p. 22.

⁶² Rebecca Crootof, "War Torts: Accountability for Autonomous Weapons," p. 1378.

⁶³ Hin-Yan Liu, "Refining Responsibility: Differentiating Two Types of Responsibility Issues Raised by Autonomous Weapons Systems," in Nehal C. Bhuta, Susanne Beck, Robin Geiß, Hin-Yan Liu, and Claus Kreß, eds., *Autonomous Weapons Systems: Law, Ethics, Policy* (Cambridge, MA: Cambridge University Press, 2016), p. 332.

⁶⁴ ICTY, *Prosecutor v. Zejnir Delalić, Zdravko Mucić, Hazim Delić and Esad*

缺乏此類觀察指標，難以判斷指揮官是否已獲得足以警惕的警訊 (sufficiently alarming)，⁶⁵ 因而無法推論其知情卻不作為，也難以據此追究間接責任。

再者，對開發商究責亦有困難。武器製造商通常在已向軍事採購方揭露故障風險後，不會因產品「如何被使用」而受追究。⁶⁶ 儘管 LAWs 研發商可能因商業故障 (commercial malfunction) 承擔責任，但其軟體多由大型或多個團隊協同開發，任何人都難以完全掌握系統在所有情境下的運作，也難以證明其行為係由特定設計者意圖造成。⁶⁷

此外，反對者認為，開發 LAWs 本身是一種去人類化行為 (dehumanization)，因其將未來可能成為攻擊對象的人類，預先轉化為供系統運算的資料單位 (data points)。⁶⁸ 且 LAWs 程式由人類編成，因此必然帶有偏見。⁶⁹ 同時，其可能為原須親身承擔作戰

Landžo (“Čelebići Case”), Judgement, Case No. IT-96-21-A, Appeals Chamber, February 20, 2001, para. 238, <<https://www.icty.org/x/cases/mucic/acjug/en/cel-aj010220.pdf>>.

⁶⁵ Bonnie Docherty, *Mind the Gap: The Lack of Accountability for Killer Robots*, p. 22.

⁶⁶ Bonnie Docherty, “Losing Humanity: The Case against Killer Robots,” *Human Rights Watch*, November 19, 2012, p. 44, <<https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots>>.

⁶⁷ Kjølsv Egeland, “Lethal Autonomous Weapon Systems under International Humanitarian Law,” *Nordic Journal of International Law*, Vol. 85, No. 2 (2016), pp. 111-112.

⁶⁸ Human Rights Watch and International Human Rights Clinic at Harvard Law School, *A Hazard to Human Rights: Autonomous Weapons Systems and Digital Decision-Making* (New York: Human Rights Watch, 2025), pp. 31-35.

⁶⁹ Katherine Chandler, *Does Military AI Have Gender? Understanding Bias and Promoting Ethical Approaches in Military Applications of AI* (Geneva:

風險者營造低風險甚至無風險的認知 (low or no risk)，⁷⁰ 從而降低決策者發動戰爭的門檻。反對者因此認為，LAWs 依循程式語言運作的決策邏輯背離人類良知，無法符合馬爾頓條款 (Martens Clause) 所強調的「人道法和公眾良知」精神，⁷¹ 因而是一項政治上不可接受、道德上令人厭惡的技術 (Politically unacceptable, morally repugnant)。⁷²

最後，LAWs 還可能因戰損或駭客而「失控」。⁷³ 且雖然擁有 LAWs 的一方可能取得優勢，卻也可能迫使弱勢方擴大戰場甚至攻擊民眾，使優勢方反陷不利。又因 LAWs 具有降低己方傷亡的特性，決策者可能憑藉其不對稱優勢持續加大投入，形成「LAWs 取得優勢、敵方擴大戰場並攻擊己方民眾，⁷⁴ 決策者再投入更多 LAWs 控制戰場」的惡性循環。

United Nations Institute for Disarmament Research, 2021), <https://unidir.org/files/2021-12/UNIDIR_Does_Military_AI_Have_Gender.pdf>.

⁷⁰ Markus Wagner, "The Dehumanization of International Humanitarian Law," p. 1419.

⁷¹ Bonnie Docherty, "Losing Humanity: The Case against Killer Robots," *Human Rights Watch*, November 19, 2012, <<https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots>>.

⁷² UN News, "Politically unacceptable, morally repugnant: UN chief calls for global ban on killer robots," *UN News*, May 9, 2025, <<https://news.un.org/en/story/2025/05/1163256>>.

⁷³ Dan Hendrycks, Mantas Mazeika, and Thomas Woodside, "An Overview of Catastrophic AI Risks," *arXiv preprint*, arXiv:2306.12001v6 [cs.CY], October 9, 2023, <<https://arxiv.org/pdf/2306.12001>>.

⁷⁴ Michael P. Ferguson, "Ghost in the Machine: Coming to Terms with the Human Core of Unmanned War," *Texas National Security Review*, Vol. 8, No. 2 (2025), p. 27.

（二）反對派的困境

儘管反對論對 LAWs 提出諸多質疑，但現代戰爭的節奏無法要求人類始終處於「迴路內」(in the loop)，逐次作出明確決策。⁷⁵換言之，現代戰場的「資訊洪流」(torrent of data) 必然使人類依賴機器判斷。⁷⁶

另一方面，堅持「人在迴路內」雖使人類成為武器系統的重要環節，卻也是最脆弱的部分，迫使系統在設計與性能上遷就人類生理限制，進而催生「將人類移除」的構想。但兼顧「人在迴路中」與「移除人類」的遠端遙控技術，卻高度依賴通訊節點，易遭破壞或干擾。因此，使武器系統具備一定程度的局域自主性(local autonomy)，便成為降低脆弱性並提升性能的合理方案。⁷⁷

這些發展迫使人類將部分戰場能動性讓渡予機器，因此當前國際共識並非全面禁止 LAWs，而是禁止那些在本質、設計或使用結果上無法符合國際人道法要求與原則者，並對可依法運作的系統加以管制。⁷⁸ 此種「禁止與管制」並行的構想(two-tier

⁷⁵ Paul Scharre and Michael C. Horowitz, *An Introduction to Autonomy in Weapon Systems* (Washington, DC: Center for a New American Security, 2015), p. 12, <https://s3.us-east-1.amazonaws.com/files.cnas.org/hero/documents/Ethical-Autonomy-Working-Paper_021015_v02.pdf>.

⁷⁶ Bode and Huelss, *Autonomous Weapons Systems and International Norms*, p. 176.

⁷⁷ Thomas K. Adams, "Future Warfare and the Decline of Human Decisionmaking," *Parameters*, Vol. 31, No. 4 (Winter 2001–02), <<https://doi.org/10.55540/0031-1723.2058>>.

⁷⁸ 無法遵循國際人道法中的區分原則、比例原則與可能造成不必要傷害的 LAWs 必須被禁止，然而各國對管制的標準，依舊沒有共識。

approach)，⁷⁹ 是當前 GGE 機制的主流意見。⁸⁰

因此，儘管反對派仍疾呼全面禁止 LAWs，先進技術國家實際上已傾向採取「禁止與管制」並行的務實立場。反對派雖能從道德與哲學層面提出有力質疑，卻也面臨技術進步的挑戰，未來可能被迫鬆動主張，以適應難以阻擋的技術發展。相關觀點整理見表 2。

表 2：反對論者的主張與困境

反對論	主張	LAWs 不具道德能動性，最多只能成為道德殭屍而無法進行有意義的究責
		將人類化約為某種資料單位，使戰爭被去人類化
		可能會降低戰爭門檻
		可能無法有效的遵循國際法
		可能因駭客或戰損而失控
		可能使劣勢的敵方擴大戰場或攻擊平民以「扳回劣勢」
	困境	現代戰場的速度與複雜性已超越人類極限，而人類往往也無法負荷特定任務的環境限制，讓 LAWs 的全面禁止顯得不切實際

資料來源：作者自行整理

⁷⁹ Laura Bruun, *Towards a Two-Tiered Approach to Regulation of Autonomous Weapon Systems: Identifying Pathways and Possible Elements* (Stockholm: SIPRI, 2024).

⁸⁰ United Nations, “Lethal Autonomous Weapons Systems: Report of the Secretary-General (A/79/88),” July 1, 2024, p. 14, <<https://undocs.org/A/79/88>>.

二、支持 LAWs 的觀點

(一) 支持者的主張

相對於反對派對法律責任與道德風險的質疑，支持者則主張 LAWs 不受人類生理與心理限制，能精確降低誤擊、附帶損害與非必要傷害，從而提高國際法遵循。即使可能遭濫用或誤用，但究責亦非無據，因《日內瓦公約》及其附加議定書、ICRC《習慣國際人道法研究》(Customary International Humanitarian Law Study)、《羅馬規約》(Rome Statute) 及《國家對國際不法行為的責任條款草案》(ILC Draft Articles on Responsibility of States for Internationally Wrongful Acts) 等，皆已提供國家與個人在戰爭中應負責任的規範與指引，足以避免責任因 LAWs 的使用而消失。

進一步而言，支持者認為，LAWs 無法究責的說法是虛假的法律問題 (faux legal issues)。首先，支持者以網路戰為例，指出網路戰的技術同樣高度複雜，但法律上「合理」的指揮官仍有取得必要知識、識別及制止戰爭罪行的能力與義務，⁸¹ 故技術複雜性不能成為規避責任的理由。其次，若 LAWs 可能造成不可預見的後果，即表示國家未履行《日內瓦公約第一附加議定書》所規定的新武器「審查義務」，⁸² 而相關國際不法行為亦可引發國

⁸¹ Charles J. Dunlap, Jr., "Accountability and Autonomous Weapons: Much Ado About Nothing?" *Temple International & Comparative Law Journal*, Vol. 30, No. 1 (2016), pp. 68-69.

⁸² Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), adopted June 8, 1977, entered into force December 7, 1978, Art. 36.

家責任 (international responsibility)。⁸³ 美軍《3000.09 指令》也要求武器使用武力時保留適當程度的人為判斷 (appropriate levels of human judgment)，⁸⁴ 從而確保 LAWs 的使用仍有人類判斷並承擔責任。

此外，以美國軍法為例，即使不存在殺害或傷害意圖，只要因「單純過失」(simple negligence) 致人死亡，仍可能構成刑事責任。⁸⁵ 換言之，「應注意而未注意」所造成的傷亡，即使缺乏主觀犯意，仍可追究刑責。而對 LAWs 缺乏人類主觀判斷而無法遵守國際法的批評，支持者則指出，武裝衝突法所需的「主觀判斷」(subjective determinations)，如比例原則與預防措施的計算 (calculations)，早已在研發階段由人類介入。量化的交戰標準 (quantitative engagement criteria)，本質上即是將人類的質性判斷 (qualitative decisions) 與主觀門檻程式化的結果。⁸⁶ 因此，將 LAWs 概稱為「人類在迴路外」(human out of the loop)，或認定其必然因缺乏主觀判斷而違法，實屬誤導。⁸⁷

⁸³ Magdalena Pacholska, "Military Artificial Intelligence and the Principle of Distinction: A State Responsibility Perspective," *Israel Law Review*, Vol. 56, No. 1 (2023), p. 6.

⁸⁴ U.S. Department of Defense, DoD Directive 3000.09: *Autonomy in Weapon Systems*, January 25, 2023, p.3, <<https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf>>.

⁸⁵ Charles J. Dunlap, Jr., "Accountability and Autonomous Weapons: Much Ado About Nothing?" *Temple International & Comparative Law Journal*, Vol. 30, No. 1 (2016), pp. 72-73.

⁸⁶ Michael N. Schmitt and Jeffrey S. Thurnher, "'Out of the Loop': Autonomous Weapon Systems and the Law of Armed Conflict," *Harvard National Security Journal*, Vol. 4, No. 2 (2013), pp. 265-266.

⁸⁷ *Ibid.*, p. 268.

即使真正「人在迴路外」，也不必然表示 LAWs 本質上違法。若其運作於無平民環境，並配賦合乎規範的武器，便未必產生違法問題。⁸⁸ 例如，在深海中的 LAWs，因環境單純、目標單一且武器合乎規範，通常不致面臨比例與區分原則困境。因此，LAWs 是否合法應依其運作環境作情境性 (contextual) 判斷，而非事先 (ex ante) 武斷認定其非法。⁸⁹

除反駁究責質疑外，支持者亦從技術效益建構 LAWs 的正當性。軍火業者認為，戰爭攸關生死，更應採用 AI，使用落後技術者並無道德立足點 (no moral high ground)。⁹⁰ 以「尊嚴」反對 LAWs，實則是將戰爭浪漫化 (romanticize warfare)，因為對陣亡者而言，被人類或機器奪取性命並無實質差異。⁹¹ 而所謂人類能動性可能只是騎士精神的當代表述，⁹² 因為實務上，當人類操作員通常透過先進設備觀察被數位化的目標並機械化執行攻擊指令時，所謂「人類能動性」與「人工能動性」其實不存在顯著差異。⁹³

⁸⁸ Ibid., p. 246.

⁸⁹ Ibid., p. 274.

⁹⁰ Lauren Edmonds, "Anduril's Palmer Luckey Makes an Ethical Case for Using AI in War: 'There Is No Moral High Ground in Using Inferior Technology,'" *Business Insider*, December 11, 2025, <<https://www.businessinsider.com/anduril-palmer-luckey-ai-war-conflict-defense-tech-startups-military-2025-12>>.

⁹¹ Michael C. Horowitz, "The Ethics & Morality of Robotic Warfare: Assessing the Debate over Autonomous Weapons," *Daedalus*, Vol. 145, No. 4 (Fall 2016), p. 32.

⁹² Alex Leveringhaus, *Ethics and Autonomous Weapons* (London: Palgrave Macmillan, 2016), p. 100.

⁹³ Ibid.

民眾對 LAWs 的態度亦高度情境化。美國研究顯示，未說明誤判風險時，僅 7% 民眾偏好 LAWs；若其可降低誤擊率，支持度則升至 67%。⁹⁴ 而日本民眾在「本土防衛」與「減少傷亡」情境下的支持率，則分別為 58.4% 與 48.8%。⁹⁵ 2026 年研究亦顯示，在 LAWs 可降低誤擊的前提下，中國大陸、德國、巴西與美國的支持度分別為 64%、50%、43% 與 41%。⁹⁶

另外，只要 LAWs 能降低平民誤傷，其接戰目標是恐怖分子或敵軍，對公眾支持度皆無顯著影響。⁹⁷ 顯示減少平民傷亡比攻擊對象更為重要。反對者雖將「演算法殺人」(death by algorithm) 視為踐踏尊嚴，⁹⁸ 但尊嚴議題對公眾態度的影響有限，也顯示民眾在特定假設情境 (hypothetical scenarios) 下的立場並非絕對。

因此，民眾對 LAWs 態度的彈性，削弱了反對派的觀點，也顯示「LAWs 無法理解生命價值」的主張，可能只是與公共意見

⁹⁴ Ondřej Rosendorf, Michal Smetana, and Marek Vranka, “Algorithmic Aversion? Experimental Evidence on the Elasticity of Public Attitudes to ‘Killer Robots’,” *Security Studies*, Vol. 33, No. 1 (2024), pp. 115-145.

⁹⁵ Koki Arai and Masakazu Matsumoto, “Public Perceptions of Autonomous Lethal Weapons Systems,” *AI and Ethics*, Vol. 4 (2024), pp. 456-457.

⁹⁶ Ondřej Rosendorf, Michal Smetana, Marek Vranka, and Anja Dahlmann, “Mind over Metal: Public Opinion on Autonomous Weapons in the United States, Brazil, Germany, and China,” *International Studies Quarterly*, Vol. 70, No. 1 (2026), Article sqag001, p. 7.

⁹⁷ Rosendorf et al., “Mind over Metal,” p. 7.

⁹⁸ Jay D. Aronson, “Science, Technology, and Human Rights,” in Frans Viljoen, Charles Fombad, Dire Tladi, Ann Skelton, and Magnus Killander eds., *A Life Interrupted: Essays in Honour of the Lives and Legacies of Christof Heyns* (Pretoria: Pretoria University Law Press, 2022), p. 301; Elvira Rosert and Frank Sauer, “Prohibiting Autonomous Weapons: Put Human Dignity First,” *Global Policy*, Vol. 10, No. 3 (2019).

脫節的空談 (idle from civic consciousness)。⁹⁹ 若國家又擔憂潛在對等競爭者發展 LAWS，¹⁰⁰ 為維持軍事平衡或取得優勢而投入研發，將更強化支持論的正當性。

（二）支持者的困境

儘管支持論在辯論中占上風，但其難以繞開的困境是 LAWS 尚未被大規模使用，¹⁰¹ 未構成重大軍事創新的示範點 (demonstration point)。¹⁰² 未來若大規模部署，其在複雜戰場環境中的實際表現仍無人確知 (no one knows)。¹⁰³ 加上支持者未提出足以支撐相關假設的實證證據與嚴謹論證，¹⁰⁴ 使其主張難以被證實。

⁹⁹ Koki Arai and Masakazu Matsumoto, *Public Perceptions of Autonomous Lethal Weapons Systems*, p. 459.

¹⁰⁰ CCW, “Report of the 2017 Session of the Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS) (CCW/GGE.1/2017/3),” *United Nations*, November 20, 2017, <<https://docs.un.org/en/CCW/GGE.1/2017/3>>.

¹⁰¹ Justin Wyatt, Joanne Nicholson, Marigold Black, and Andrew Dowse, *Understanding How to Scale and Accelerate the Adoption of Robotic and Autonomous Systems into Deployable Capability: Phase 1—Identifying Barriers* (Australian Army Occasional Paper No. 20) (Canberra: Australian Army Research Centre, 2024), p. 50.

¹⁰² 即新興技術的所有潛力，透過先行者的實際行動，在國際體系中獲得展示並被合理的知曉，並促使其他國家開始考量跟進該項創新的研發與應用的重大時刻。詳見 Michael C. Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton, NJ: Princeton University Press, 2010).

¹⁰³ Markus Wagner, “The Dehumanization of International Humanitarian Law,” p. 1421.

¹⁰⁴ Peter Asaro, “On Banning Autonomous Weapon Systems” , p. 704.

再者，人工智慧的機器學習具有「內在不可預測性」(inherently unpredictable)，¹⁰⁵ 使支持者所宣稱優於人類道德判斷的程式設計，可能只是一種技術性的「希望軟體」(technological hopeware)。¹⁰⁶ 因為無論從數學或科學角度，人類仍缺乏戰略與道德決策的「參數」(parameter)，故難以將人類價值觀完整融入系統。¹⁰⁷

因此，由於缺乏實際使用經驗，尚無法證明 LAWs 的大規模部署是否符合國際法要求。¹⁰⁸ 支持者雖在辯論中占優勢，仍須面對其能否確實遵守國際法，以及能否在戰場上區分軍民等艱難問題 (daunting problems)。¹⁰⁹ 換言之，支持者雖主張 LAWs 能符合法規，卻仍無從證實。相關立場綜述見表 3。

¹⁰⁵ Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems*, p. 179

¹⁰⁶ Noel E. Sharkey, “The Evitability of Autonomous Robot Warfare,” *International Review of the Red Cross*, Vol. 94, No. 886 (Summer 2012), p. 796.

¹⁰⁷ Michael Hirsh, “The AI Doomsday Machine Is Closer to Reality Than You Think,” *Politico*, September 2, 2025, <<https://www.politico.com/news/magazine/2025/09/02/pentagon-ai-nuclear-war-00496884>>.

¹⁰⁸ Edward Hunter Christie, Amy Ertan, Laurynas Adomaitis, and Matthias Klaus, “Regulating Lethal Autonomous Weapon Systems: Exploring the Challenges of Explainability and Traceability,” *AI and Ethics*, Vol. 4 (2024), p. 232.

¹⁰⁹ Bonnie Docherty, “Losing Humanity” .

表 3：支持論者的主張與困境

支持論	主張	LAWs 不受環境、情緒與生理限制，更能有效依循國際法規
		現有國際法規足以為 LAWs 之使用與究責提供良好指引
		正因攸關生死，才更需要使用最先進技術，放棄使用新技術者，沒有道德立足點
		人類能動性與機器能動性實務上沒有區別，因為在敵對情境中，人類往往仍會執行攻擊指令
		對生命尊嚴的堅持，在結果上無意義，只是將戰爭浪漫化
		民眾對 LAWs 的認知與選擇是高度情境化，一味反對的立場已經與公眾認知脫節
	困境	LAWs 的效益須大規模部署與使用方能驗證，但 LAWs 與真實戰場環境的互動情形尚屬未知

資料來源：作者自行整理

三、反思論的觀點

除正反雙方外，尚有對 AI 能否改變戰爭型態抱持懷疑的反思論者。其認為，無論決策輔助或自主武器，AI 尚未影響戰爭本質；當前相關「未來推測」多建立於尚未實現的「技術想定」，¹¹⁰並不會改變戰爭中的決策下達與人為判斷。

¹¹⁰ Toni Erskine, “Before Algorithmic Armageddon: Anticipating Immediate Risks to Restraint When AI Infiltrates Decisions to Wage War,” *Australian Journal of International Affairs*, Vol. 78, No. 2 (2024), p. 176.

反思派指出，只有對戰爭抱持遊戲化與媚俗化想像 (gamified, or ‘kitsch’ vision of war) 者，才會認為任務導向的狹隘 AI 能取代人類決策，因為其所依賴的歸納邏輯 (Inductive Logic)，與戰場判斷所需的溯因邏輯 (Abductive Logic) 並不相容。¹¹¹ 因此，當前 AI 辯論實際上將戰爭想像為封閉系統中的可計算遊戲，排除戰略、政治、地理、歷史、摩擦與矛盾，只剩戰鬥甚至殺戮。¹¹² 這種想像，與戰爭充滿不確定性、機會與摩擦的本質完全脫節¹¹³。

反思派亦指出，技術樂觀主義使人們關注「假設性的技術奇點」(hypothetical ‘singularity’)，卻忽略現有技術的風險。¹¹⁴ 衝突模擬顯示，現有 AI 在高風險決策中往往偏好軍備競賽、衝突甚至核武使用，¹¹⁵ 因而不宜承擔高階決策。當前 AI 決策輔助更像在決策者耳邊低語的策士，其自動化偏見可能造成責任錯置 (misplaced responsibility)；加上人類傾向逃避責任，AI 甚至可能淪為人造的替罪羔羊 (synthetic scapegoat)。¹¹⁶ 因此，有學

¹¹¹ Cameron Hunter and Bleddyn E. Bowen, “We’ll Never Have a Model of an AI Major-General: Artificial Intelligence, Command Decisions, and Kitsch Visions of War,” *Journal of Strategic Studies*, Vol. 47, No. 1 (2024), pp. 116-146.

¹¹² Cameron Hunter and Bleddyn E. Bowen, “We’ll Never Have a Model of an AI Major-General,” p. 129.

¹¹³ Carl von Clausewitz, *On War (Vom Kriege)*, trans., Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976).

¹¹⁴ Toni Erskine, “Before Algorithmic Armageddon,” p. 176.

¹¹⁵ Max Lamparth and Jacquelyn Schneider, “Why the Military Can’t Trust AI: Large Language Models Can Make Bad Decisions—and Could Trigger Nuclear War,” *Foreign Affairs*, April 29, 2024, <<https://www.foreignaffairs.com/united-states/why-military-cant-trust-ai>>.

¹¹⁶ Toni Erskine, “Before Algorithmic Armageddon,” p. 181.

者主張限縮狹隘 AI 的使用範圍 (making narrow AI systems even narrower)，並以人為制度引導其導入，以抑制「委託人工智慧」(delegated intelligence) 的負面效應。¹¹⁷

因此，反思派認為，依據「今日」AI 所描繪的未來，往往忽略其軍事應用的實際困難，並帶來嚴重的認識論風險 (serious epistemological dangers)。¹¹⁸ AI 不會取代人類，也不會改變戰爭本質；反而因人類具備應對戰場不確定性的獨特能動性，其重要性將進一步提升。

綜上所述，反思論者從技術可行性與戰爭本質出發，質疑 AI 軍事化爭論的基本前提。他們認為，以現有技術推估未來發展仍言之過早，且易忽略當前風險，使討論失焦，並陷入錯誤的認識論框架。

伍、LAWs 開發的正當性建構

儘管 LAWs 議題尚處於各方觀點相互辯論的階段，但實務上，部分先進國家對此技術的開發卻躍躍欲試，並會透過「適當性邏輯」與「結果性邏輯」，為自身發展與運用 LAWs 賦予正當性。基於此，以下闡述兩種邏輯，並說明國家如何透過兩種邏輯正當化 LAWs 的開發與使用。

¹¹⁷ Benjamin M. Jensen, Christopher Whyte, and Scott Cuomo, “Algorithms at War: The Promise, Peril, and Limits of Artificial Intelligence,” *International Studies Review*, Vol. 22, No. 3 (2020), pp. 526-550.

¹¹⁸ Anthony King, *AI, Automation, and War: The Rise of a Military-Tech Complex* (Princeton, NJ: Princeton University Press, 2025).

一、適當性邏輯與結果性邏輯

武器是否受禁止或約束，通常牽涉武器使用的「適當性」與「結果」之考量。前者為「適當性邏輯」(the logic of appropriateness)，意指決策者的行為取決於其在情境中關於社會角色義務之有意識考量，而非個人偏好。¹¹⁹ 此邏輯包含決策者對情境、自身角色、與行動是否恰當的一系列認知與考量。¹²⁰ 換言之，武器技術的開發與使用，是否被視為「適當且合宜」的選項，是決策者的主要依據。¹²¹

而「結果性邏輯」(logic of consequences)認為，決策者的行為反映其使結果符合主觀期望的努力，¹²² 並可細分為關注「立即性後果」的「軍事效用學派」(Military Utility School)與聚焦「長期性後果」的「戰略互動學派」(Strategic Interaction School)。¹²³ 換言之，武器技術使用之「立即性後果」與「長期性後果」是否

¹¹⁹ Daryl G. Press, Scott D. Sagan, and Benjamin A. Valentino, “Atomic Aversion: Experimental Evidence on Taboos, Traditions, and the Non-Use of Nuclear Weapons,” *American Political Science Review*, Vol. 107, No. 1 (2013), p. 189.

¹²⁰ James G. March and Johan P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics* (New York: The Free Press, 1989), p. 23.

¹²¹ 例如針對核武器的使用，著名案例即是在韓戰期間拒絕使用熱核武器的杜魯門總統 (Harry S. Truman)，他曾回憶道：「我無法下令屠殺 2 千 5 百萬名非戰鬥人員 ... 我就是無法下達會引爆第三次大戰的命令，我知道我是對的。」詳見 Harry S. Truman, *Off the Record: The Private Papers of Harry S. Truman*, ed. Robert H. Ferrell (New York: Harper & Row, 1980)。

¹²² James G. March and Johan P. Olsen, *Rediscovering Institutions*, p. 160.

¹²³ Daryl G. Press, Scott D. Sagan, and Benjamin A. Valentino, *Atomic Aversion*, pp. 189-193.

滿足主觀期待，是決策者是否使用該武器的主要依據。

以熱核武器為例，軍事效用學派主張，儘管使用核武可滿足擊潰特定區域敵軍之目的，但可能引發核反擊、輻射落塵；¹²⁴ 環境衝擊；¹²⁵ 通訊中斷等立即性的不利因素。¹²⁶ 而就戰略互動學派所強調的長期後果 (longer term consequences) 而言，¹²⁷ 動用核武亦可能促使他國鬆動自我限制（如研發核武或化武），並代表該國率先放棄不被禁忌武器攻擊的立場。¹²⁸ 且核武涉及大規模生命剝奪，無法遵循區分與比例原則而違背國際法規，¹²⁹ 最終帶來國

¹²⁴ Tom Sauer, “How Useful Are Nuclear Weapons in Practice? Case-Study: The War in Ukraine,” *Journal for Peace and Nuclear Disarmament*, Vol. 7, No. 1 (2024), pp. 199-200.

¹²⁵ Arthur H. Westing, “Environmental Impact of Nuclear Warfare,” *Environmental Conservation*, Vol. 8, No. 4 (1981), pp. 269-273; Remus Prăvălie, “Nuclear Weapons Tests and Environmental Consequences: A Global Perspective,” *Ambio*, Vol. 43, No. 6 (2014), pp. 729-744.

¹²⁶ Carlo Kopp, “The Electromagnetic Bomb: A Weapon of Electrical Mass Destruction,” *Air & Space Power Chronicles* (1996), <<https://apps.dtic.mil/sti/citations/ADA332511>>.

¹²⁷ Daryl G. Press, Scott D. Sagan, and Benjamin A. Valentino, “Atomic Aversion,” p. 191.

¹²⁸ James Scouras ed., *On Assessing the Risk of Nuclear War* (Laurel, MD: The Johns Hopkins University Applied Physics Laboratory, 2021), p. 235, <<https://www.jhuapl.edu/sites/default/files/2022-12/OnAssessingRiskNuclearWar.pdf>>.

¹²⁹ 如違反《公民與政治權利國際公約》中對生命權的保障；也可能觸發《防止及懲治滅絕種族罪公約》中的種族滅絕罪；亦違背 1977 年《日內瓦公約第一附加議定書》第 35 條第 3 款對於禁止「採用預期或可能造成廣泛、長期且嚴重自然環境損害之戰爭手段或方法」的規範等，詳參閱 International Court of Justice, “Legality of the Threat or Use of Nuclear Weapons: Advisory Opinion of 8 July 1996,” *Reports of Judgments, Advisory Opinions and Orders* (1996), <<https://www.icj-cij.org/sites/default/files/case->

內反對派制衡、國際孤立與制裁等不利後果。因此，無論就短期或長期後果而言，使用核武都無利可圖。

二、LAWs 的風險轉移與人道敘事

而就 LAWs 而言，前述兩種邏輯首先反映在國家對傷亡風險轉移與人道效益的考量上。在西方戰爭觀中，軍事行動可行性取決於傷亡暴露與政治可用性 (political usability) 之權衡。¹³⁰ 進一步而言，在武裝衝突中，民眾支持度與戰場勝利呈正相關，但勝利定義難明。因此，民眾多以傷亡數量評價執政者的戰爭管理能力。¹³¹ 此傾向形塑了在政治與生命風險間權衡的「風險轉移戰爭」(risk-transfer) 概念，¹³² 即決策者透過各種手段減少己方傷亡，從而維持民眾支持。¹³³

related/95/095-19960708-ADV-01-00-EN.pdf>.

¹³⁰ 軍事單位依據屬性與在戰場上發揮軍事效益所需要的「距離」，而有不同傷亡暴露指數。例如步兵必須親臨戰場並承受較高風險，而發射巡弋飛彈的部隊則可遠離戰場而有較低的傷亡暴露指數。因此步兵在直接衝突的場景中，雖然得以符合戰術需求，卻可能因高傷亡率而使其在政治上的可用性較低。詳見 Edward N. Luttwak, *The Virtual American Empire: War, Faith, and Power* (New York: Routledge, 2009), pp. 125-133.

¹³¹ Carrie A. Lee, "Polarization, Casualty Sensitivity, and Military Operations: Evidence from a Survey Experiment," in Gordon M. Friedrichs and Jordan Tama eds., *Polarization and US Foreign Policy: When Politics Crosses the Water's Edge* (Cham, Switzerland: Palgrave Macmillan, 2024), p. 352.

¹³² Martin Shaw, *The New Western Way of War: Risk-Transfer War and Its Crisis in Iraq* (Cambridge: Polity, 2005).

¹³³ 西方國家並非完全無法承受傷亡，而是取決於以下三項指標：戰爭是否被視為是正當的？是否是勝利的？傷亡事件是如何被理解與詮釋的？若這三者達成平衡，則民眾對於傷亡的容忍度較高，這樣的戰爭也會被視為是「運行得宜」的 (well run)。詳見 Martin Shaw, *The New Western Way of War*, pp. 79-80.

儘管國家有許多方式迴避傷亡敏感性並轉移可能的風險，¹³⁴然而一旦風險轉移手段出現不可控發展，¹³⁵就可能出現「風險反彈」(risk rebound)，即原本用以轉移風險的機制，最終卻重新對政府造成風險。¹³⁶

但先進技術國家尚有以資本與技術取代人力的風險轉移手段。如無人機與精準引導武器的搭配，具備選擇性 (Selectivity) 與飛行員免傷性 (pilot invulnerability) 特徵。前者透過精確識別與攻擊提高對敵人施加的成本；後者則降低己方傷亡並減少海外基地需求，¹³⁷使常規武器使用在道德與政治層面為國內公眾所接受。

¹³⁴ 如透過私營軍事公司，「隱藏」人力耗損 (hiding the full human cost)；藉由空優來減少地面部隊傷亡；使用特種部隊或招募邊緣團體 (socially marginal groups) 或將暴力外包給當地團體 (local groups)。詳見 Heidi Peltier, "The Growth of the 'Camo Economy' and the Commercialization of the Post-9/11 Wars," *Costs of War Project*, Watson Institute for International and Public Affairs, Brown University, June 30, 2020, p. 7, <<https://costsofwar.watson.brown.edu/sites/default/files/papers/Peltier-Camo-Economy.pdf>>; Frank Sauer and Niklas Schörnig, "Killer Drones: The 'Silver Bullet' of Democratic Warfare?" *Security Dialogue*, Vol. 43, No. 4 (2012), p. 369; Christopher Kinsey and Eyal Ben-Ari, "Military Contractors in a Post-Heroic Society: Organizational Adaptation and Military Autonomy," in Uzi Ben-Shalom, René Moelker, Nehemia Stern, and Eyal Ben-Ari eds., *Military Heroism in a Post-Heroic Era* (Cham: Springer, 2024), p. 256.

¹³⁵ 例如國家可能對當地代理勢力缺乏控制力；軍事公司、代理人與國家間可能有分歧的利益與忠誠 (divided agendas and loyalties)；且空優與特種部隊也存造成己方與平民傷亡的風險。因此，儘管國家試圖轉移戰爭風險，但戰爭本身的風險並未消失，而是被重新分配至敵方部隊、當地代理勢力及軍事行動區域的平民身上。詳見 Kinsey and Ben-Ari, "Military Contractors in a Post-Heroic Society," pp. 256, 260.

¹³⁶ Martin Shaw, "Risk-Transfer Militarism, Small Massacres and the Historic Legitimacy of War," *International Relations*, Vol. 16, No. 3 (2002), p. 357.

¹³⁷ James Igoe Walsh and Marcus Schulzke, *Drones and Support for the Use of*

因此，支持者賦予先進 LAWs 一定的「人道期待」，並將其視為「戰爭中的道德機器人」(Ethical Robots in Warfare)。¹³⁸這可能使 LAWs 在本質上被視為更高效、道德且人道的戰爭方式。這將塑造與 LAWs 相關的「適當性」邏輯，因為其使用是「人道的」，也自然是「適當的」。

三、戰略競逐與國家—科技企業關係

然而，LAWs 開發與使用的正當性，除建立在風險轉移與人道效益之上，也與國家對戰略優勢的追求，以及科技企業對關鍵技術的掌握有關。因此，國家會結合政策敘事與社會對技術的理解，透過未來想像的協同生產 (co-production) 與展演性政治 (performative politics)，將技術願景轉化為政策現實。¹³⁹如日本以「勞務替代」敘事主張 LAWs 可緩解自衛隊人力需求；¹⁴⁰美國則強調其可保護人員、執行指揮官命令並精確使用武力，將其塑造成保護型機器人 (machine guardians)。¹⁴¹俄羅斯亦主張 LAWs 可

Force (Ann Arbor, MI: University of Michigan Press, 2018), pp. 1-28.

¹³⁸ Ronald C. Arkin, "Ethical Robots in Warfare," *IEEE Technology and Society Magazine*, Vol. 28, No. 1 (Spring 2009), p. 30; Ronald C. Arkin, "The Case for Banning Killer Robots," *Communications of the ACM*, Vol. 58, No. 12 (December 2015), p. 46.

¹³⁹ Jascha Bareis and Christian Katzenbach, "Talking AI into Being: The Narratives and Imaginaries of National AI Strategies and Their Performative Politics," *Science, Technology, & Human Values*, Vol. 47, No. 5 (2022), pp. 867-869.

¹⁴⁰ Daisuke Akimoto, "International Regulation of 'Lethal Autonomous Weapons Systems' (LAWS): Paradigms of Policy Debate in Japan," *Asian Journal of Peacebuilding*, Vol. 7, No. 2 (2019), p. 316.

¹⁴¹ Tom FA Watts and Ingvild Bode, "Machine Guardians: The Terminator, AI Narratives and US Regulatory Discourse on Lethal Autonomous Weapons

提高導引精度、降低民用物體遭誤擊的風險，¹⁴² 並排除操作員失誤、身心狀態及價值判斷的干擾，¹⁴³ 因而更能遵守國際法。¹⁴⁴ 這些敘事將軍事 AI 描繪為爭奪戰略優勢的必要技術，¹⁴⁵ 並以防空系統等自主武器早已投入使用、用途受限且具防禦性為由，塑造既成事實。¹⁴⁶

Systems,” *Cooperation and Conflict*, Vol. 59, No. 1 (2024).

¹⁴² Russian Federation, “Working Paper of the Russian Federation: ‘Application of International Law to Lethal Autonomous Weapons Systems (LAWS),’” Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), 2022, <https://documents.unoda.org/wp-content/uploads/2022/07/WP-Russian-Federation_EN.pdf>.

¹⁴³ Russian Federation, *Approaches of the Russian Federation to the Issue of Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*, Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), 2024, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2024\)/CCW-GGE.1-2024-WP.2_English.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2024)/CCW-GGE.1-2024-WP.2_English.pdf)>.

¹⁴⁴ Russian Federation, *Considerations for the Report of the Group of Governmental Experts of the High Contracting Parties to the Convention on Certain Conventional Weapons on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems on the Outcomes of the Work Undertaken in 2017–2021*, Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), 2021, <[https://unoda-documents-library.s3.amazonaws.com/Convention_on_Certain_Conventional_Weapons_-Seventh_Group_of_Governmental_Experts\(2021\)/CCW-GGE.1-2021-WP.1_English.pdf](https://unoda-documents-library.s3.amazonaws.com/Convention_on_Certain_Conventional_Weapons_-Seventh_Group_of_Governmental_Experts(2021)/CCW-GGE.1-2021-WP.1_English.pdf)>.

¹⁴⁵ Jascha Bareis and Christian Katzenbach, “Talking AI into Being: The Narratives and Imaginaries of National AI Strategies and Their Performative Politics,” *Science, Technology, & Human Values*, Vol. 47, No. 5 (2022), pp. 867-869.

¹⁴⁶ Bode and Huelss, *Autonomous Weapons Systems and International Norms*, p. 199.

此種正當性論述亦結合戰場「反應時間壓力」與「大國競逐」。美國軍方官員即以現代戰場速度為由，宣稱「除人工智慧之外別無他法」。¹⁴⁷ 美國官方還認為，AI 技術發展迅速、門檻降低且由商業部門推動，使國家與非國家行動者皆能取得相關能力，侵蝕其軍事優勢。¹⁴⁸ 故須發展可信任的 AI 並及時部署 (deploying new capabilities to the battlefield in a timely manner)。¹⁴⁹ 為維持軍事與軍民兩用技術優勢，AI、量子計算與自主系統遂成為發展重點，並被認為須透過「去管制化」促進創新。¹⁵⁰

由於擁有國防創新生態系或 AI 獨角獸企業 (AI unicorns) 的國家，亦能取得較大的國際話語權，¹⁵¹ 美國遂在安理會第 10005

¹⁴⁷ Thomas Karako and Jon Hill, *A Vision for the Future of Missile Defense*, Center for Strategic and International Studies (CSIS), October 7, 2019, <<https://www.csis.org/analysis/vision-future-missile-defense>>.

¹⁴⁸ U.S. Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: Department of Defense, 2018), p. 3, <<https://media.defense.gov/2020/May/18/2002302061/-1/-1/1/2018-NATIONAL-DEFENSE-STRATEGY-SUMMARY.PDF>>.

¹⁴⁹ The White House, *National Security Strategy* (Washington, DC: The White House, 2022), p. 21, <<https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf>>.

¹⁵⁰ The White House, *National Security Strategy of the United States of America* (Washington, DC: The White House, 2025), pp. 21-22, <<https://www.whitehouse.gov/wp-content/uploads/2025/12/2025-National-Security-Strategy.pdf>>.

¹⁵¹ Mahmoud Javadi and Michal Onderco, "State Positioning in European Military AI Networks: A Social Network Analysis of European Partnerships in Military AI," *Journal of Contemporary European Studies*, Vol. 33, No. 4 (2025), p. 1322.

次會議中，¹⁵² 反對以官僚式管理限制軍事 AI，主張技術發展應奠基於公民的自由與責任、政治人物的審慎與合作，以及國家的獨立與主權。¹⁵³

在此趨勢下，國家日益須與私人科技企業共享 AI 治理權，掌握關鍵技術的企業也可能形成不對稱槓桿。當其技術跨境進入他國軍事體系時，企業設定的技術標準與使用限制，也可能影響該國的審計、查核與規範選擇。因此，AI 企業對軍事化應用的態度，成為觀察 LAWs 發展與規範外溢的重要變項。如 Google 曾參與 Project Maven，運用 AI 處理無人機影像，卻因員工反對「從事戰爭業務」，宣布不再續約並發布人工智慧倫理原則 (ethical principles)，承諾不開發武器技術。¹⁵⁴ 然而，Google 其後表示，退出 Project Maven 僅是「一次性的調整」(a one-time “reset”)，不妨礙其在其他項目上繼續與軍方合作。¹⁵⁵

其後，科技企業對軍事用途的限制逐漸鬆動，OpenAI 與

¹⁵² 該次會議為高級別公開辯論，故並未產生決議。

¹⁵³ United States Mission to the United Nations, “Remarks at the Security Council’s Open Debate on Artificial Intelligence and International Peace and Security,” *United States Mission to the United Nations*, September 24, 2025, <<https://usun.usmission.gov/remarks-at-the-security-councils-open-debate-on-artificial-intelligence-and-international-peace-and-security/>>.

¹⁵⁴ Human Rights Watch and International Human Rights Clinic, *Heed the Call: A Moral and Legal Imperative to Ban Killer Robots*, Human Rights Watch and Harvard Law School International Human Rights Clinic, August 2018, p. 37, <https://www.hrw.org/sites/default/files/report_pdf/arms0818_summaryheedthecall.pdf>.

¹⁵⁵ Sydney J. Freedberg Jr., “Google To Pentagon: ‘We’re Eager To Do More,’” *Breaking Defense*, November 5, 2019, <<https://breakingdefense.com/2019/11/google-pentagon-pledge-to-work-together-were-eager-to-do-more/>>.

Google 分別於 2024 年、¹⁵⁶ 2025 年解除相關限制。¹⁵⁷ 2026 年，Anthropic 則拒絕美軍將其模型「無限制使用」(unrestricted access) 於所有「合法用途」(all lawful use) 的要求，¹⁵⁸ 因為在法規未明的情況下，幾乎所有軍事應用皆可能被納入合法用途。¹⁵⁹ 該要求亦牴觸 Anthropic 禁止大規模國內監控與 LAWs 開發的政策；前者涉及隱私侵害，後者則源於現有 AI 尚不足以支撐 LAWs 可靠運作之疑慮。¹⁶⁰

此現象反映國家軍事需求與企業倫理限制間的矛盾。Anthropic 隨後被美國政府列為供應鏈風險企業，並由 OpenAI 取

¹⁵⁶ Hayden Field, “OpenAI Quietly Removes Ban on Military Use of Its AI Tools,” *CNBC*, January 16, 2024, updated January 17, 2024, <<https://www.cnbc.com/2024/01/16/openai-quietly-removes-ban-on-military-use-of-its-ai-tools.html>>.

¹⁵⁷ Nitasha Tiku and Gerrit De Vynck, “Google Drops Pledge Not to Use AI for Weapons or Surveillance,” *The Washington Post*, February 4, 2025, <<https://www.washingtonpost.com/technology/2025/02/04/google-ai-policies-weapons-harm/>>.

¹⁵⁸ Dave Lawler and Maria Curi, “Pentagon-Anthropic Battle Pushes Other AI Labs into Major Dilemma,” *Axios*, February 19, 2026, <<https://www.axios.com/2026/02/19/anthropic-pentagon-ai-fight-openai-google-xai>>.

¹⁵⁹ Aryamehr Fattahi, “Pentagon AI Integration and Anthropic: Ethics, Strategy, and the Future of Defence Technology Partnerships,” *Bloomsbury Intelligence & Security Institute*, February 20, 2026, <<https://bisi.org.uk/reports/pentagon-ai-integration-and-anthropic-ethics-strategy-and-the-future-of-defence-technology-partnerships>>.

¹⁶⁰ Anthropic, “Statement from Dario Amodei on Our Discussions with the Department of War,” February 26, 2026, <<https://www.anthropic.com/news/statement-department-of-war>>。Anthropic 在聲明中的 LAWs 標準是「完全無需人工干預，自動選擇和攻擊目標」(humans out of the loop entirely and automate selecting and engaging targets)。

代。¹⁶¹ 有觀點認為，此舉可能使未來國防供應形成「雙軌市場」(a 2-tier market)，區隔國防生態系內外的企業，¹⁶² 並促使 AI 獨角獸企業與國家更深度糾纏，強化國家在國際政治中的技術不對稱槓桿。同時，美國《戰爭部人工智慧戰略》要求 AI 模型公開後 30 日內提供作戰人員使用，並將其列為主要採購標準 (primary procurement criterion)。¹⁶³ 卻也引發時限不足以完成技術與倫理審查的「30 天問題」(The 30-Day problem)，¹⁶⁴ 亦即倉促審查可能使武器系統在實際運用中暴露未知缺陷與風險。然而，在戰略競爭敘事下，此類風險敘事往往退居次位，AI 企業甚至以「準文明聖戰」定位自身，宣稱其具有戰略意義而不容失敗。¹⁶⁵

¹⁶¹ Ashley Capoot, "OpenAI Strikes Deal with Pentagon, Hours after Rival Anthropic Was Blacklisted by Trump," *CNBC*, February 27, 2026, updated February 27, 2026, <<https://www.cnbc.com/2026/02/27/openai-strikes-deal-with-pentagon-hours-after-rival-anthropic-was-blacklisted-by-trump.html>>.

¹⁶² Aryamehr Fattahi, "Pentagon AI Integration and Anthropic: Ethics, Strategy, and the Future of Defence Technology Partnerships," *Bloomsbury Intelligence & Security Institute*, February 20, 2026, <<https://bisi.org.uk/reports/pentagon-ai-integration-and-anthropic-ethics-strategy-and-the-future-of-defence-technology-partnerships>>.

¹⁶³ U.S. Department of War, *Artificial Intelligence Strategy for the Department of War: Accelerating America's Military AI Dominance*, memorandum, January 9, 2026, p. 4, <https://media.defense.gov/2026/Jan/12/2003855671/-1/-1/0/ARTIFICIAL-INTELLIGENCE-STRATEGY-FOR-THE-DEPARTMENT-OF-WAR.PDF>>.

¹⁶⁴ Lorna Akoacha Enow, "The 30-Day Problem: Can Democracies Move Fast Enough on AI?" *Blavatnik School of Government, University of Oxford*, February 4, 2026, <<https://www.bsg.ox.ac.uk/blog/30-day-problem-can-democracies-move-fast-enough-ai>>.

¹⁶⁵ Manuel G. Pascual, "Big Tech Enters the War Business: How Silicon Valley Is Becoming Militarized," *El País*, July 21, 2025, <<https://english.elpais.com/>>.

綜上所述，國家發展 LAWs，對外可在長期強權競逐中鞏固軍事優勢、國際話語權與軍用裝備市場地位；對內則可藉由更人道的戰爭敘事與更高效的戰爭管理，強化政治正當性。因此，LAWs 的研發與使用可能成為難以逆轉的趨勢。一旦其需求被嵌入地緣政治競逐與安全需求的敘事，並與 AI 獨角獸企業的技術優勢結合，GGE 在共識決機制下將更難履行制定國際規範的使命。

陸、LAWs 規範的雙軌制及其限制

綜上所述，國家對 LAWs 開發與使用的正當性建構，使全面禁止的主張更難實現，但相關安全、法律與倫理疑慮並未因此消失。基於軍事需求與規範風險的雙重考量，禁用與管制並行的雙軌制便成為折衷方案。

一、雙軌制的規範邏輯與國家立場

以歐盟與中國為例，前者認為 LAWs 是「在『選擇與攻擊個別目標』等關鍵功能上，缺乏『有意義的人類控制』(Meaningful Human Control) 的武器系統」；¹⁶⁶ 因此應該禁止。中國則將必須被禁止的 LAWs 定義為包括但不限於以下五項基本特徵的武器系

economy-and-business/2025-07-21/big-tech-enters-the-war-business-how-silicon-valley-is-becoming-militarized.html>.

¹⁶⁶ European Parliament, “European Parliament Resolution of 12 September 2018 on Autonomous Weapon Systems,” *Official Journal of the European Union*, C 433, December 23, 2019, p. 87, <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018IP0341>>. 需要說明的是，該項定義系歐洲議會之文件所提出之概念，並非歐盟執委會的正式定義。

統：「第一是致命性，意指具備足以致命的有效載荷（彈頭、裝藥）；第二是自主性，意指在整個執行任務過程中缺乏人類干預與控制；第三是不可終止性，意指一旦啟動便無法關閉或停止；第四是無差別效果，意指該裝置不論條件、場景與目標，皆會執行殺傷任務；第五是演化性，意指該裝置能透過與環境的互動自我學習，自主擴展其功能與能力，並可能超出人類預期。」¹⁶⁷

二、歐盟的管制實踐與制度限制

就歐盟而言，其對 LAWs 所主張的原則性立場，與實際採取的管制措施並不完全一致。歐洲議會早於 2014 年主張禁止研發 LAWs，¹⁶⁸ 歐盟代表則在 2018 年 GGE 會議中強調，LAWs 必須遵守一系列廣泛接受的國際人道法原則。¹⁶⁹ 此外，歐盟亦在法律上禁止透過「歐洲國防工業計畫」(EDIP) 資助 LAWs 開發。¹⁷⁰

¹⁶⁷ China, “Position Paper,” Group of Governmental Experts on Lethal Autonomous Weapons Systems (GGE LAWS), CCW/GGE.1/2018/WP.7, April 11, 2018, p. 1, <<https://docs.un.org/en/CCW/GGE.1/2018/WP.7>>.

¹⁶⁸ European Parliament, “European Parliament Resolution of 27 February 2014 on the Use of Armed Drones,” February 27, 2014, <https://www.europarl.europa.eu/doceo/document/TA-7-2014-0172_EN.html>.

¹⁶⁹ European Union, “EU Statement,” Group of Governmental Experts on Lethal Autonomous Weapons Systems, Convention on Certain Conventional Weapons, Geneva, August 27-31, 2018, <https://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2018/gge/statements/29August_EU.pdf>。這些原則包含了適當的人類控制 (appropriate human control)，區分原則 (distinction)、比例原則 (proportionality) 與攻擊預防措施 (precaution in attack) 保護平民人口，以及保護病患、傷者、戰俘與喪失戰鬥能力者 (hors de combat)。

¹⁷⁰ European Parliament and Council of the European Union, “Regulation (EU) 2025/2643 of the European Parliament and of the Council of 16 December 2025 Establishing the European Defence Industry Programme and a

然而，此一限制僅排除歐盟層級的資助，並不禁止成員國自行研發；且歐洲議會立場不具法律拘束力，也不完全等同於歐盟官方政策。已有學者指出，歐盟官方聲明中並未提出對 LAWs 實施「預先禁令」(pre-emptive ban) 的建議，¹⁷¹ 顯示歐洲議會與歐盟官方在 LAWs 政策認知上可能存在分歧。

《歐盟人工智慧法案》(EU AI Act) 亦將軍事用途排除於適用範圍之外。其理由在於，涉及「致命武力的使用」(use of lethal force) 及軍事與國防活動時，「國際公法」(public international law)，亦即武裝衝突法，被視為規範 AI 系統「更適當之法律框架」(more appropriate legal framework)，而非歐盟內部的民用科技法規。¹⁷² 有觀點認為，此一排除是為了維護歐盟的科技主權 (technological sovereignty) 與戰略自主性 (strategic autonomy)。¹⁷³ 換言之，儘管歐盟試圖使該法案成為全球標竿

Framework of Measures to Ensure the Timely Availability and Supply of Defence Products,” *Official Journal of the European Union*, L 2025/2643, December 29, 2025, Art. 10(2)(b), p. 32, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202502643>.

¹⁷¹ Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective* (Cambridge, MA: Cambridge University Press, 2022), p. 133.

¹⁷² European Parliament and Council of the European Union, “Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence and Amending Regulations and Directives,” *Official Journal of the European Union*, L 2024/1689, July 12, 2024, Recital 24, <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1689>>.

¹⁷³ Sebastian Clapp, *Defence and Artificial Intelligence*, briefing, European Parliamentary Research Service, Members’ Research Service, PE 769.580, April 11, 2025, p. 11, <<https://www.europarl.europa.eu/RegData/etudes/>

(global benchmark)，其對軍事用途的豁免仍顯示成員國尚未準備放棄 LAWs 可能帶來的戰略優勢。¹⁷⁴ 鑒於 GGE 的制度困境本就源於國家利益與地緣政治分歧，歐盟排除軍事用途的作法，反而使其標竿願景被批評為製造「危險的管制真空」(a dangerous regulatory void)。¹⁷⁵

在個別國家層次上，部分立場亦值得注意。例如，法國與德國在 2021 年 GGE 會議共提的工作文件中，主張各國可就 LAWs 進行自願性資訊交換。¹⁷⁶ 然而，此作法被批評為「遮羞布戰略」(fig leaf strategy)，目的在於避免更嚴格的法律限制，¹⁷⁷ 並在大國權力競逐中保留發展 LAWs 的政策彈性。

BRIE/2025/769580/EPRS_BRI(2025)769580_EN.pdf>.

¹⁷⁴ Federico Santopinto, *The EU, Artificial Military Intelligence and Autonomous Lethal Weapons*, Institut de Relations Internationales et Stratégiques, Programme Defence & Security Industry, April 2024, p. 7, <https://www.iris-france.org/wp-content/uploads/2017/05/Prog-IndusDef_2024_04_SALA_EN.pdf>.

¹⁷⁵ Eirini Dellagrammatika Bizmpiki, “The EU AI Act, Lethal Autonomous Weapons, and the Imperative for Human-Centric AI,” *European Scientific Journal*, Vol. 22, No. 8 (2026), pp. 5-7.

¹⁷⁶ France and Germany, “Outline for a Normative and Operational Framework on Emerging Technologies in the Area of LAWS,” Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons System, CCW/GGE.1/2021/WP.5, September 27, 2021, p. 3, <[https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Seventh_Group_of_Governmental_Experts_\(2021\)/CCW-GGE.1-2021-WP.5_English.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Seventh_Group_of_Governmental_Experts_(2021)/CCW-GGE.1-2021-WP.5_English.pdf)>.

¹⁷⁷ Thomas Christian Bächle and Jascha Bareis, “‘Autonomous Weapons’ as a Geopolitical Signifier in a National Power Play: Analysing AI Imaginaries in Chinese and US Military Policies,” *European Journal of Futures Research*, Vol. 10, Article 20 (2022), p. 16.

換言之，歐盟雖原則上支持雙軌制，但軍事與國防事務屬成員國專屬權限 (exclusive competence)，任何歐盟層級倡議均須經會員國一致同意 (unanimity) 方能推動。¹⁷⁸ 因此，歐盟僅能宣示遵守 GGE 於 2019 年通過、但不具法律拘束力的指導原則。各國對其意義亦有分歧，例如葡萄牙認為該原則僅是 GGE 成員間的最低共識，不應被視為 GGE 機制的終點 (not be interpreted as an end)，亦不代表其使命已完成。¹⁷⁹ 這顯示歐盟整體立場與個別成員國實踐之間存在落差，呈現「原則上一致、實踐上分歧」(unity in principle, variation in practice) 的現象。¹⁸⁰

三、中國大陸的定義與管制立場

中國大陸亦呈現類似情況。儘管其尚未制定全面性法案，但在 GGE 提出的立場已受到檢視。其所界定的五項 LAWS 特徵被批評門檻過高，例如要求系統必須「完全無法終止」且具備「無

¹⁷⁸ Federico Santopinto, *The EU, Artificial Military Intelligence and Autonomous Lethal Weapons*, Institut de Relations Internationales et Stratégiques, Programme Defence & Security Industry, April 2024, p. 6, <https://www.iris-france.org/wp-content/uploads/2017/05/Prog-IndusDef_2024_04_SALA_EN.pdf>.

¹⁷⁹ GGE on LAWS, “Commentaries by Portugal on ‘Operationalising All Eleven Guiding Principles at a National Level,’” Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, Geneva, 2020, <<https://documents.unoda.org/wp-content/uploads/2020/09/20200831-Portugal1.pdf>>.

¹⁸⁰ Gerald Mako, “Unity in Principle, Variation in Practice: European Approaches to Meaningful Human Control for LAWS,” *Articles of War*, Lieber Institute, West Point, May 11, 2026, <<https://lieber.westpoint.edu/unity-principle-variation-practice-european-approaches-meaningful-human-control-laws/>>.

差別攻擊」的非法性質，使幾乎所有現存或研發中的相關武器系統都被排除於定義外。¹⁸¹ 此種定義因而被視為替未來發展 LAWs 「預留後門」(leave a backdoor open)。¹⁸²

綜上，歐盟與中國大陸雖均支持雙軌制，¹⁸³ 但無論在法律規範或定義建構上，仍保留解釋空間。換言之，雙軌制形式上雖提供介於禁止與開放之間的折衷方案，但國家仍可透過排除軍事用途、採取軟性監管、提高定義門檻或保留技術發展彈性等方式，削弱其影響力。

柒、結論

儘管 GGE 是當前商議 LAWs 議題最具權威性的國際平台，各國對其定義與管制方式仍缺乏共識，對指導原則的意義亦有分歧。這不僅阻礙規範制定，也顯示 LAWs 治理的困難主要源於政治歧見。

¹⁸¹ Austin Wyatt, *The Disruptive Impact of Lethal Autonomous Weapons Systems Diffusion: Modern Melians and the Dawn of Robotic Warriors* (Abingdon: Routledge, 2022), pp. 18-20.

¹⁸² Thomas Christian Bächle and Jascha Bareis, “‘Autonomous Weapons’ as a Geopolitical Signifier in a National Power Play: Analysing AI Imaginaries in Chinese and US Military Policies,” *European Journal of Futures Research*, Vol. 10, Article 20 (2022), p. 15.

¹⁸³ 中國大陸將 LAWs 區分為「不可接受的」和「可接受的」，針對前者可達成「法律文書」加以「禁止」；而後者則採取必要的「風險減緩措施」。詳見中華人民共和國外交部，〈中國就「致命性自主武器系統」問題向聯合國秘書長提交的文件〉，2024 年 5 月 23 日，<https://www.mfa.gov.cn/web/wjb_673085/zzjg_673183/jks_674633/fywj_674643/202405/t20240523_11310587.shtml>.

就學術辯論而言，支持派與反對派雖各有困境，支持論仍相對占優勢，顯示技術需求可能超越道德與能動性之爭。當國家將 LAWs 描繪為更精準且人道的戰爭方式，其便可能成為風險轉移戰爭的技術解方。此一敘事亦促使國家與 AI 獨角獸企業相互靠攏：國家仰賴企業維持戰略競爭力，企業則調整倫理政策以融入國防市場。最終，得以融入國防需求體系的企業將進一步確立其獨角獸地位，而未能融入者將無法有效因應市場需求，使國防供應被切割為雙軌市場。

在此趨勢下，LAWs 預期將逐步應用於不同軍事任務，其規範將可能需透過實踐經驗與國家互動逐步形成。綜合而言，GGE 對 AI 軍事化的規範建構正朝向「有限度的技術治理」，而非基於道德共識的全面禁止。然而，GGE 迄今尚無明確成果，因而促使國際社會尋求其他對話場域。國家與 AI 企業的結合，也可能使掌握「技術自主」者影響他國 LAWs 政策的「規範自主」。隨軍事 AI 從戰場行為者延伸至決策輔助系統 (AIDSS)，相關治理問題亦將引發更多辯論。（投稿：2026 年 1 月 30 日；修訂：2026 年 5 月 20 日；接受：2026 年 6 月 10 日）

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