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THE NEED FOR AN AUSTRALIAN REGULATORY CODE FOR THE USE OF ARTIFICIAL INTELLIGENCE (AI) IN MILITARY APPLICATION

SASCHA-DOMINIK DOV BACHMANN[*] AND RICHARD V. GRANT[†]

Artificial Intelligence (AI) is enabling rapid technological innovation and is ever more pervasive, in a global technological eco-system lacking suitable governance and absence of regulation over AI-enabled technologies. Australia is committed to being a global leader in trusted secure and responsible AI and has escalated the development of its own sovereign AI capabilities. Military and Defence organisations have similarly embraced AI, harnessing advantages for applications supporting battlefield autonomy, intelligence analysis, capability planning, operations, training, and autonomous weapons systems. While no regulation exists covering AI-enabled military systems and autonomous weapons, these platforms must comply with International Humanitarian Law, the Law of Armed Conflict, and the Use of Force. This paper examines comparative international regulatory approaches across major allied nations in the US, UK, and Europe and suggests future direction for Australian regulation of AI in lethal application.

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Alongside the benefits, AI will also bring dangers, like powerful autonomous weapons, or new ways for the few to oppress the many.

- Stephen Hawking[1]

I. INTRODUCTION

Artificial Intelligence (AI) is recognised as the 'cornerstone technology of the Fourth Industrial Revolution and is enabling rapid innovation with many potential benefits for Australian society'[2] and associated technological advancements are an 'increasingly ubiquitous part of the everyday lives of Australians, transforming the way we live and work'[3] with its uses furthering humankind seeming endless, ranging from 'virtual assistants, smart phones, driverless vehicles and autonomous drones … healthcare diagnostics, predictive policing, human resource analytics or personal financial investment…'[4] which all allow things to be done '… cheaper, faster and better than people are.'[5] AI also continues to enliven conversations of technologists, scientists, ethicists, academic philosophers, industry, military and government leaders, from its many benefits, and even raises concerns of some, seeing it having crossed the bounds from science fiction, to what may play out as a path to finality, '…the impact[s] of the AI revolution are far reaching as intelligent machines may become our "final invention" that may end human supremacy.'[6] Hawking himself called for additional research in the field of AI, however, he was

[1] Stephen Hawking, Professor, Keynote Address at Leverhulme Center for the Future of Intelligence (CFI) (Oct. 19, 2016) (Hawking spoke at the launch of the CFI which comprises multi-disciplinary research institutions including Cambridge, Oxford, Berkely and Imperial College, London).
[2] *See* STEVE LOCKEY ET AL., TRUST IN ARTIFICIAL INTELLIGENCE: AUSTRALIAN INSIGHTS 2 (Univ. Queensl. & KPMG Austl. eds. 2020); *see also* KPMG AUSTRALIA, FOURTH INDUSTRIAL REVOLUTION BENCHMARK (KPMG & Faethm eds., 2021).
[3] Spyros Makridakis, *The Forthcoming Artificial Intelligence (AI) Revolution: Its Impact on Society and Firms,* 90 FUTURES 46, 46-60 (2017).
[4] *See* KPMG AUSTRALIA, FOURTH INDUSTRIAL REVOLUTION BENCHMARK 43 (KPMG & Faethm eds., 2021).
[5] RYAN ABBOTT, THE REASONABLE ROBOT: ARTIFICIAL INTELLIGENCE AND THE LAW 1 (Cambridge Univ. Press, 2020).
[6] Spyros Makridakis, *The Forthcoming Artificial Intelligence (AI) Revolution: Its Impact on Society and Firms,* 90 FUTURES 46, 47 (2017) (citing JAMES BARRAT, OUR FINAL INVENTION: ARTIFICIAL INTELLIGENCE AND THE END OF THE HUMAN ERA (St. Martin's Press ed., 1st ed. 2013)).

'…not convinced that AI was to become the harbinger of the end of humanity, but was instead balanced about its risks and rewards.'[7]

As advocated by Bennett Moses, the acknowledged ever-persistent 'techno-legal' challenge entices lawmakers and policy makers to 'bridge the chasm' between regulation of new technologies, and yield balanced outcomes for protection of citizens' rights and business interests.[8] Yet the 'regulatory environment for AI and robots is complex, diverse and diffuse'[9] and effective regulation is continually hampered by the 'pacing problem'[10] in which opposing forces of 'technology that is developing at exponential speeds, compared with the slow pace of law's reaction to the new technology, creating a gap or a void in which no law applies to the technology.'[11] Regardless, the global appetite for AI systems is ever increasing and global market intelligence provided by International Data Corporation in 2022, predicts the continuing, insatiable spend on AI-centric systems will reach $118 Billion in 2022, and surpass $300 Billion US in 2026,[12] already eclipsing previous IDC estimates to 2025.[13]

This paper examines Australian and International Law using a blend of doctrinal and comparative research methodology[14] and delivers a functional comparison[15] of AI regulation and lethal application.

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[7] Lucy Ingham, *Stephen Hawking – The Rise of Powerful AI Will be Either the Best or the Worst Thing Ever to Happen to Humanity*, FACTOR (Sept. 10, 2022), https://magazine.factor-tech.com/factor_spring_2018/stephen_hawking_rise_of_powerful_ai_will_be_either_the_best_or_the_worst_thing_ever_to_happen_to_humanity.
[8] Lyria Bennett Moses*, Regulating in the Face of Sociotechnical Change*, 2016 OXFORD HANDBOOK L., REGUL. & TECH. 573, 573-596.
[9] MICHAEL GUIHOT & LYRIA BENNETT MOSES, ARTIFICIAL INTELLIGENCE, ROBOTS, AND THE LAW 104 (LexisNexis, 2020).
[10] Lyria Bennett Moses, *Recurring Dilemmas: The Law's Race to Keep up with Technological Change*, 2007 ILL. J. L., TECH. & POL'Y 239, 239 (2007) (discussing the slow pace at which the law adapts to rapidly evolving technology).
[11] MICHAEL GUIHOT & LYRIA BENNETT MOSES, *supra* note 9, at 105.
[12] Press Release, International Data Corporation, Worldwide Spending on Artificial Intelligence-Centric Systems Will Pass $300 Billion by 2026, (Sept. 12, 2022) (on file with author).
[13] Richard V. Grant, Is Australia's approach to AI Inventorship Supported by Current Patents Law? 1-2 (May 06, 2022) (Review Paper, Canberra Law School) (on file with Canberra Law School).
[14] TERRY HUTCHINSON, RESEARCHING AND WRITING IN LAW (Lawbook Co. 4th ed., 2018).
[15] MATTHIAS SIEMS, COMPARATIVE LAW (Cambridge Univ. Press, 2nd ed., 2018).

First, this paper discusses AI in military applications. Next, it examines Australian domestic laws pertaining to Artificial Intelligence (or absence of) and those legislative instruments relating to Defence functions and Lethal Autonomous Weapons Systems (LAWS) to identify whether there are any existing regulatory instruments (or absence of), in relation to AI in lethal application. Further, this section will contemplate any ethical code(s) in place or being developed for the use of AI, in Defence and lethal applications, such as LAWS. Additionally, the paper discusses governance through the lens of International Law and the Use of Force – *jus ad bellum*, International Humanitarian Law, the Law of Armed Conflict – *jus in bello*, and together with a comparative perspective, which draws insights from across key strategic alliance partner nations from AUKUS[16] and Five Eyes[17] jurisdictions, including the United Kingdom (UK), the United States of America (US), together with insights from the European Union, to identify any approaches in AI regulation in military lethal application. Finally, to conclude, the paper outlines what recommendations for the future direction of the Australian regulatory environment may be possible, and to bring focused regulatory reform to the use of AI in military and lethal applications.[18]

II. ARTIFICIAL INTELLIGENCE IN MILITARY APPLICATIONS[19]

The attraction of AI in military applications, according to NATO is the intelligent, highly functional solutions which integrate deep analytical processes and knowledge-based capabilities.[20] They are capable of widespread deployment, can be networked and interconnected across the

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[16] Department of Defence, *The AUKUS Nuclear-Powered Submarine Pathway*, DEF. AUSTL. (Sept. 14, 2022), https://www.defence.gov.au/about/taskforces/aukus.
[17] Office of the Director of National Intelligence, Five Eyes Intelligence Oversight and Review Council, OFF. DIR. NAT'L INTEL. (Sept. 15, 2022), https://www.dni.gov/index.php/who-we-are/organizations/enterprise-capacity/chco/chco-related-menus/chco-related-links/recruitment-and-outreach/217-about/organization/icig-pages/2660-icig-fiorc.
[18] Richard V. Grant, Research Essay 3 (Aug. 19, 2022) (Review Paper, Canberra Law School) (on file with Canberra Law School).
[19] Sentient Digital Inc., The Most Useful Military Applications of AI, SENTIENT DIGIT. INC. (Sept. 22, 2022), https://sdi.ai/blog/the-most-useful-military-applications-of-ai/.
[20] D.F. REDING & J. EATON, SCIENCE & TECHNOLOGY TRENDS 2020-2040 1 (2020), https://www.nato.int/nato_static_fl2014/assets/pdf/2020/4/pdf/190422-ST_Tech_Trends_Report_2020-2040.pdf.

physical and virtual domains.[21] AI solutions handle and process very large volumes of data, computation, and advanced large data analysis, with low error rates, providing complex automation of multiple streams of repetitive processes rapidly. Szabadföldi concurs with this position and outlines that '…AI supports long term Capability Planning by the development of analytical solutions, including supporting complex decision-making by assessments of complex factors.'[22]

The US Department of Defense (US DoD), Advanced Research Projects Agency, *DARPA* outlined in March 2019, '…enabling computing systems with such human-like intelligence is now of critical importance because the tempo of military operations in emerging domains exceeds that at which unaided humans can orient, understand, and act.'[23] The US DoD focussed on '… ways to harness [AI] for advantages [in] battlespace autonomy, intelligence analysis, record tracking, predictive maintenance and military medicine. AI is a growth area for DoD … to integrate AI into weapon systems development, augment human operators with AI driven robotic manoeuvre on the battlefield and enhance precision of military fires.'[24]

Zhang et al, analysed various AI related projects of US and European governments, and identified seven major military application categories, which AI enhances military capability.

These are summarised below:

1) Intelligent target identification and monitoring
2) Autonomous weapons platforms
3) Battlefield simulation and training
4) Data intelligence processing and prediction
5) Cybersecurity

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[21] *Id.*
[22] István Szabadföldi, *Artificial Intelligence in Military Application – Opportunities and Challenges*, 26 LAND FORCES ACAD. REV. 157, 163–64 (2021).
[23] DEF. ADVANCED RSCH. PROJECTS AGENCY, DEPARTMENT OF DEFENSE FISCAL YEAR 2020 BUDGET ESTIMATES: RESEARCH, DEVELOPMENT, TEST & EVALUATION, DEFENSE-WIDE, EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION: PB 2020 DEFENSE ADVANCED RESEARCH PROJECTS AGENCY BUDGET ACTIVITY 0400 PROGRAM ELEMENT IT-04 ARTIFICIAL INTELLIGENCE AND HUMAN SYMBIOSIS (2019).
[24] D.F. REDING & J. EATON, *supra* note 20, at 53.

6) Logistics and Battlefield healthcare
7) Military vocational education[25]

On the domestic front, Australia made significant investments in partnership with Boeing, for the Loyal Wingman project, for development of a stealth, unmanned aerial vehicle (UAV) to support the Royal Australian Airforce (RAAF). The UAV is designed as an 'uncrewed aircraft … for integration of autonomous systems and artificial intelligence to create smart human-machine teams'[26] and designed to fly alongside crewed RAAF aircraft performing autonomous missions using AI.[27] The project is 'part of Australia's $35 million Trusted Autonomous Systems program…to deliver trustworthy AI into the Australian military.'[28]

The Loyal Wingman, now MQ-28 Ghost Bat[29] airpower teaming system platform provides a 'disruptive advantage for allied forces' in crewed and uncrewed flight missions, using AI to fly independently or in support of crewed aircraft while maintaining safe distance between other aircraft'[30] and 'designed, engineered and manufactured in Australia…'[31] This platform enjoyed successful introduction with Defence (RAAF) and captured the attention of The Hon. Frank Kendall, US Air Force Secretary, who confirmed the '…USAF could buy the Australian drone (MQ-28), as a "risk-reduction mechanism" … for US development of drone capabilities for Next Generation Air Dominance (NGAD).'[32]

By developing sovereign defence industry capability, supporting the Australian Defence Force (ADF), the Federal Government awarded defence contracts for AI technologies in 2021

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[25] YuLong Zhang et al., *Application of Artificial Intelligence in Military: From Projects View,* 2020 6TH INT'L CONF. ON BIG DATA & INFO. ANALYTICS (BIGDATA) 113, 113–15.
[26] *Ghost Bat*, ROYAL AUSTL. AIR FORCE, https://www.airforce.gov.au/our-work/projects-and-programs/ghost-bat (last visited Sept. 15, 2022).
[27] DEP'T OF DEF., *Department of Defence 2021 First flight for Loyal Wingman*, DEP'T OF DEF. defence.gov.au/new-events/news/2021-03-03/first-flight-loyal-wingman.
[28] TOBY WALSH, MACHINES BEHAVING BADLY: THE MORALITY OF AI 87 (2022).
[29] *Airpower Teaming System*, BOEING, https://www.boeing.com/defense/airpower-teaming-system/index.page (last visited Sept. 15, 2022).
[30] *Id.*
[31] ROYAL AUSTL. AIR FORCE, *supra* note 26.
[32] Thomas Nedwick, *USAF Eyeing MQ-28 Ghost Bat for Next Gen Air Dominance Program*, THE WAR ZONE (Aug. 24, 2022, 06:10 PM), thedrive.com/the-war-zone/usaf-might-buy-mq-28-ghost-bats-for-next-gen-air-dominance-program.

to build defence military capability[33] focussed on improvements for military training and operations, and to optimise military capability and operational efficiency. Examples are listed in the table below. (Table 1.0).

Table 1.0: Examples of Australian Industry AI technologies to build ADF Military capability

Source: Media Release 18 November 2021 Minister for Defence Industry, Science and Technology, Australian Government[34]

Defence Industry Participant	**AI Technology Focus**
Lumination, South Australia www.lumination.com.au	AI augmented virtual reality scenarios enhancing Defence training simulation.
Droneshield, New South Wales www.droneshield.com	AI for multi-mission Threat protection and counter-UAS (Unmanned Aerial Systems).
Simbiant Pty Ltd, South Australia www.simbiant.com.au	AI based radio frequency generation, detection, classification, and characterisation system
Solinnov Pty Ltd, South Australia www.solinnov.com.au	AI/Machine learning portable radio frequency monitoring solution for complex operating environments
Real Response Pty Ltd, Victoria www.realresponse.com.au	AI medical care training simulator for complex battlefield medical scenarios.
CAE Australia Pty Ltd, New South Wales www.cae.com/defense-security/regional-operations/cae-australia	AI augmented reality 3D virtual modelling for decision support and aerospace simulator.

These examples represent non-lethal military AI applications, supporting sovereign capability and improvements in training/operational planning for military personnel. Other non-lethal military AI applications include, systems for improved complex decision-making, data information processing, intelligence analysis, records management, materiel sustainment and

[33] Media Release, Melissa Price, Minister, Def. Indus. (Austl.), $10 Million to Build Defence's Capability and Support Critical Tech for Australia (Nov. 18, 2021), https://www.minister.defence.gov.au/media-releases/2021-11-18/10-million-build-defences-ai-capability-and-support-critical-tech-australia#:~:text=The%20Morrison%20Government%20is%20investing,jobs%20in%20Australia%E2%80%99s%20defence%20industry.

[34] *Id.*

predictive maintenance, war gaming, battlefield/combat simulation, cybersecurity, logistics and transport, battlefield healthcare simulation, fast detection, identification and monitoring of hazards, threat monitoring, integrated air and missile defence systems, and situational awareness in the battlefield.[35]

Interestingly, the Commonwealth's investments in military AI technologies, is dwarfed by the US Government's (Pentagon) investment program, harnessing the power of AI for the US Department of Defense (US DoD).[36] By comparison, in 2020, the Pentagon invested US$1 billion into AI technologies thereby '…ensuring the US military does not lag behind rival world powers.'[37] The White House confirmed, 'the rapid advancement and proliferation of new technologies is changing the character of war.'[38]

In March 2019, as the Ghost Bat platform was announced, the US Army 'announced ATLAS: the Autonomous Targeting and Lethality Automated System…a robot tank. The US Navy announced its first fully autonomous ship *Sea Hunter* … [with its] record-breaking voyage from Hawaii to California without human intervention.'[39] This all attests to rapid advances in AI-enabled military applications, and voracious appetite for these new technological advancements.

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[35] *Smart warfare- Defence invests in AI capability*, GOV'T NEWS: DEF. (Nov. 23, 2021), www.governmentnews.com.au/smart-warfare-defence-invests-in-ai-capability; Fact Sheet on Military Uses of Artificial Intelligence, Automation, and Robotics (MUAAR), NATO ALLIED COMMAND TRANSFORMATION OPERATIONAL EXPERIMENTATION [hereinafter NATO OPEX] (Feb. 2020), https://www.act.nato.int/application/files/5515/8257/4725/2020_mcdc-muaar.pdf and note military hazards can include Chemical, Biological, Radiological and Nuclear (CBRN) hazards.
[36] BREAKING DEFENSE, ARTIFICIAL INTELLIGENCE: THE FRONTLINE OF A NEW AGE IN DEFENSE Breaking Defense, Artificial Intelligence: The Frontline of a New Age in Defense 3 (ebook).
[37] *DoD Growth in Artificial Intelligence: The Frontline of a New Age in Defense*, BREAKING DEF. (Sept. 18, 2019, 09:00 PM), https://breakingdefense.com/2019/09/dod-growth-in-artificial-intelligence-the-frontline-of-a-new-age-in-defense/.
[38] OFF. OF MGMT. & BUDGET, EXEC. OFF. OF THE PRESDIENT, BUDGET OF THE UNITED STATES GOVERNMENT, FISCAL YEAR 2020 24 (2019).
[39] WALSH, *supra* note 28, at 87.

A. Lethal Military Applications

The colloquial term 'killer robots' coined by world media and industry watchers to group a class of autonomous weapons systems, known as Lethal Autonomous Weapons Systems (LAWS), through AI, according to US DoD Directive 3000.09, '…once activated, can select, and engage targets without further intervention by a human operator. This includes human-supervised autonomous weapon systems that are designed to allow human operators to override operation of the weapon system but can select and engage targets without further human input after activation.'[40]

LAWS have been described as '…armed weapons systems, capable of learning and adapting their "functioning in response to changing circumstances in the environment in which [they are] deployed," as well as capable of making firing decisions on their own.'[41] Some organisations endeavoured to sub-categorise levels of human intervention and oversight, assisting non-technical and non-military personnel understanding, when discussing autonomous weapons systems.[42] This is particularly important for anyone involved in the potential regulation of autonomous weapons systems. It is the element of 'human control' that is the most useful criteria and outlined in the representative listing. (Table 2.0).

[40] *See* Dep't of Def. Directive 3000.09, *Autonomy in Weapons Systems* 21 (2023); *see also id.* at 22–23 (defining operator-supervised autonomous weapon system and semi-autonomous weapon system which allow operator to intervene or terminate system engagements).
[41] Heather Roff, *Lethal Autonomous Weapons and Jus Ad Bellum Proportionality*, 47 CASE W. RESRV. J. INT'L L. 37, 38 (2015).
[42] *See* Coralie Consigny, *Are Killer Robots Better Soldiers? The Legality and Ethics of the Use of AI at War,* HUM. RTS. PULSE (Feb. 8, 2022), https://www.humanrightspulse.com/mastercontentblog/are-killer-robots-better-soldiers-the-legality-and-ethics-of-the-use-of-ai-at-war.

Table 2.0: Autonomous Weapons Systems – Levels of Human control

Source: adapted from Human Rights Pulse - *Are Killer Robots better soldiers? The legality and ethics of the use of AI at War.*[43]

Autonomous Weapons Systems – Levels of Human control	**Description**
'*Human-in-the-Loop*' weapons systems	Weapons systems that deliver force *exclusively under* human control and oversight.
'*Human-on-the-Loop*' weapons systems	Weapons systems that *allow* human intervention in targeting and firing sequences
'*Human-out-of-Loop*' weapons systems	Weapons systems that discard any human intervention or oversight in application and operation. An autonomous weapons system that existed when human supervision is absent or so limited, any such weapon system may be classed as 'out-of-the-Loop' and would be designated a fully autonomous weapon system.[44]

Presently, there are no fully autonomous lethal weapons systems in production or operations, that this author is aware of, through public domain research access. While definitions of lethal autonomous weapon systems seem elusive, the notion of 'meaningful human control' is gaining acceptance through its adoption by the United States and International Committee of Red Cross (ICRC), and a '… growing number of CCW States Parties…finding broad acceptance in both academic literature and diplomatic debate.'[45] A brief analysis of current 'semi-autonomous' weapons systems are provided in (Table 3.0).

[43] *Id.*; *see also* Bonnie Docherty, *The Trouble with Killer Robots*, HUM. RTS. WATCH: FOREIGN POL'Y (Nov. 19, 2012, 11:00 AM), https://www.hrw.org/news/2012/11/19/trouble-killer-robots.
[44] Docherty, *supra* note 43.
[45] Frank Sauer, *Stepping Back from the Brink: Why Multilateral Regulation of Autonomy in Weapons Systems is Difficult, yet Imperative and Feasible*, 102 INT'L REV. RED CROSS 235, 239 (2020); U.N. 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 (and Protocols) (As Amended on 21 December 2001) [hereinafter Convention on Certain Conventional Weapons (CCW)], Oct. 10, 1980, 1342 U.N.T.S. 137.

Table 3.0: Examples of 'Semi-autonomous' weapons systems in development or operation

Source: Akimoto, 2019, International Regulation of "Lethal Autonomous Weapons Systems' (LAWS): Paradigms of policy debate in Japan[46]

Domain	Human-*in*-the-Loop Weapons	Human-*on*-the-Loop Weapons
Sea	**Protector USV** – unmanned surface vessel with mini typhoon weapon station (Israel) ***Sea Hunter*** autonomous unmanned surface vessel (USV) Anti-submarine warfare (USA)	**Aegis Combat systems**, integrated naval weapons system (USA).[47] **CIWS Phalanx:** Close-in-Weapons-Systems, automatic military watercraft protection (USA) **Goalkeeper** close in weapons systems (Netherlands) **AK-630** fully automatics naval close in weapon system PMK-2 (Russia)
Land	**Guardian** and **Border Protector** (Israel) **SGR-A1** autonomous sentry gun (South Korea)	**Iron Dome** – mobile all weather air missile defence system (Israel) **C-RAM** - counter rocket artillery, mortar weapon system, **MIM-104 Patriot** surface to air missile system and **THAAD** – terminal high altitude area defence missile system, anti-ballistic missile defence (USA)
Air	**MQ-1 Predator** – remotely piloted aircraft (RPA) (US) **MQ-9 Reaper** - unmanned aerial vehicle (UAV) remote controlled autonomous flight operations – hunter-killer UAV (USA) **MQ-4C Triton*** - unmanned surveillance and reconnaissance aerial vehicle (USA/Australia) – presently unarmed	**Harpy** – loitering munition optimised for suppression of enemy air defences (Israel) **Harop** – battlefield loitering munition optimised for battlefield attack on enemy ground targets (Israel)

[46] Daisuke Akimoto, *International Regulation of "Lethal Autonomous Weapons Systems" (LAWS): Paradigms of Policy Debate in Japan*, 7 ASIAN J. PEACEBUILDING 311, 323 (2019) (compiled table from Bode, Ingvild, & Hendrik Huelss, *Autonomous Weaspons Systems and Changing Norms in International Relations*, 44 REV. INT'L STUD. 393 (2018); Siego Iwamoto, Robot Heiki to Kokusai Ho (Robot Weapons and International Law) in Robot/AI to HO (The Laws of Robots and Artificial Intelligence) (Masao Yanaga & Joji Shishido, eds., 2018)).

[47] BREAKING DEFENSE, ARTIFICIAL INTELLIGENCE: THE FRONTLINE OF A NEW AGE IN DEFENSE Breaking Defense, Artificial Intelligence: The Frontline of a New Age in Defense 3 (ebook) noting Aegis is an example of complext automation assisting if human operators become overwhelmed).

III. AUSTRALIAN LEGISLATION

For optimal balance between efficiency and effectiveness of regulation, it is important to look at what level of regulatory action is a) appropriate, and b) warranted to address the perceived challenges faced. The Australian Government's publication 'Guide to Regulatory Impact Analysis' defines regulation as '… [a]ny rule endorsed by government where there is an expectation of compliance'[48] and provides a spectrum of regulation options, which range from 'self-regulation' (voluntary codes of practice or principles for industry) through 'co-regulation' (strong industry-governmental relationships and accreditation schemes), to 'quasi-regulation' (codes or accreditation schemes to influence industry behaviour), and finally 'explicit government regulation', also what we know as 'black-letter law' or legislation, comprising primary and subordinate legislation.[49] This is the most common category of regulation and is actioned where 'risk' is perceived to be high or in the public interest.[50]

The Australian Government estimated, through its Digital Economy Strategy, that AI developments will realise global economic inputs, approximating $20 trillion by 2030,[51] and in March 2022, the then Morrison Government released National AI Action initiative to assist industry with the adoption of AI and focus on future developments in this technological field. The Federal Government promised $124 million investment 'to establish Australia as a global leader in developing and adopting trusted, secure and responsible AI'[52] and launched the National Artificial Intelligence Centre on 14 December 2021 'to unlock the potential of AI for business by coordinating Australia's AI expertise and capabilities.'[53] As part of this initiative, it

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[48] AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, AUSTRALIAN GOVERNMENT GUIDE TO REGULATORY IMPACT ANALYSIS 8 (2020).
[49] *Id.* at 31.
[50] *Id.* at 30-31.
[51] AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, POSITIONING AUSTRALIA AS A LEADER IN DIGITAL ECONOMY REGULATION – AUTOMATED DECISION MAKING AND AI REGULATION 1 (2020).
[52] Press Release, The Hon. Melissa Price, Launch of National Artifical Intelligence Center to Back Australia's AI Future (Dec. 14, 2021), https://www.minister.industry.gov.au/ministers/price/media-releases/launch-national-artificial-intelligence-centre-back-australias-ai-future.
[53] *Id.*

launched reviews of Australia's regulatory and legal framework covering AI to ensure any AI regulation and laws are fit for purpose, with a specific example being the inquiry conducted by the Digital Technology Taskforce into AI regulation and automated decision making in Australia[54] supported by consultation with industry, academics, business leaders and members of the public focussed on 'regulatory settings to position Australia as a leader in digital economy regulation."[55]

A. Australian Law and their Application to Military Use of AI

Importantly, there exist no specific laws that regulate AI in Australia[56] and to date, any heavy lifting coverage has fallen to Australian domestic laws covering privacy,[57] corporations law,[58] intellectual property law,[59] and data security laws.[60] This presents a sub-optimal situation requiring multiple legislative instruments to cover aspects of regulation for AI in Australia. Another example is the laws of negligence and civil liability, which do not contemplate situations where the operation of AI may inflict harm or damage on humans, through a breach of duty of care and preventing any foreseeable harm.[61] Case law is instructive here, seen in *Class Action Settlement* with Australian Government (Services Australia), for the Federal Court of Australia found the 'Robodebt' Automated decision-making program to be 'unlawful."[62]

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[54] AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, *supra* note 51.
[55] *Consultation launched to position Australia as a leader in digital economy regulation*, AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, (March 18, 2022) www.pmc.gov.au/news-centre/domestic-policy/consultation-launched-position-ausralia-leader-digital-economy-regulation.
[56] *AI, Machine Learning & Big Data Laws and Regulations 2022,* GLOBAL LEGAL INSIGHTS, https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/australia.
[57] Privacy Act, 1988 (Act No. 119/1988) (Austl.).
[58] Corporations Act, 2001 (Act No. 50/2001) (Austl.).
[59] Copyright Act, 1968 (Act No. 63/1968) (Austl.); Patents Act, 1990 (Act No. 83/1990) (Austl.).
[60] Security Legislation Amendment (Critical Infrastructure) Act, 2021 (Act No. 124/2021) (Austl.) (The Act introduced security obligations on owners and operators of critical infrastructure); Security Legislation Amendment (Critical Infrastructure) Act, 2022 (Austl.) (This Act introduced additional reforms for enhanced cyber security); Data Availability and Transparency Act , 2022 (Act No. 158/2022) (Austl.) (This Act regulates access to government data by any government or private sector entities).
[61] David Rolph, *Duties and Liabilities – Duty of Care*, in HALSBURY'S L. AUSTL. 300-30 (2018).
[62] *Class action settlement,* AUSTRALIAN GOV'T, SERVICES AUSTL., (Dec. 12, 2022) servicesaustralia.gov.au/information-for-people-who-got-class-action-settlement-notice?content=60271; Prygodicz v Australia (No 2) (2021) [2021] FCA 634 (Austl.).

An important distinction ought to be made here in relation to regulation regarding AI and is tabled concisely by Australian Human Rights Commission (AHRC), in 2019 whitepaper on AI Governance and Leadership.[63] AHRC reasoned in favour of Australia adopting the 'right governance framework for AI' and significantly, any regulation should focus on 'outcomes of AI, in preference to general regulation of AI technology.'[64] The AHRC argument for protection for all Australians, through innovation, and reinforcing our liberal democratic values, will require '…carefully crafted laws supported by an effective regulatory framework, strong incentives that apply to the public and private sectors, and policies that enable Australians to navigate an emerging AI-powered world.'[65]

AHRC acknowledges certain high risk uses of new AI technologies drive many 'pressing human rights issues' and in a recent 2021 report '*Human Rights and Technology Final Report,*' the AHRC focussed on use of AI in government decision making and less so on the '… few types of technology [that] require regulation targeted specifically at the technology itself….'[66] Concerning types of AI technology for facial recognition, nuclear and aviation technology, the report notes that ' … specific laws might be needed regarding the use of AI in high-risk areas such as…autonomous weapons...'[67] and settings '… where the risk to human rights is particularly high, such as in the use of (lethal) autonomous weapons systems ….'[68] AHRC notes '…some complexities can arise—either where an AI informed decision-making system operates largely autonomously, or where numerous parties are involved in designing, developing and using the system.'[69]

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[63] AUSTRALIAN HUM. RTS. COMM'N, ARTIFICIAL INTELLIGENCE: GOVERNANCE AND LEADERSHIP WHITEPAPER (2019).
[64] *Id.* at 6.
[65] *Id.*
[66] AUSTRALIAN HUM. RTS. COMM'N, HUMAN RIGHTS AND TECHNOLOGY FINAL REPORT (2021).
[67] *Id.* at 49 (discussing framework for regulation), 57 (identifying the correct regulatory object).
[68] *Id.* at 57.
[69] *See Id.* at 79; *see also* Kyarash Shahriari & Mana Shahriari, *Ethically Aligned Design: A Vision for Prioritising Human Wellbeing with Autonomous and Intelligent Systems*, IIEE (2017).

Importantly, analysis of research conducted by Global Legal Insights in *AI, Machine Learning & Big Data Laws and Regulations 2022*[70] identified that '…[t]here are no specific AI, big data or machine learning laws or regulations in Australia to date…', however, momentum is gathering for public comment in areas of '…regulatory barriers to AI…need for new regulation or guidance, and what international frameworks Australia should consider adopting'[71] in the face of the rapid pace of AI technological developments which continues unabated. Similarly, there is active debate regarding the use of AI in military applications, in military command seminars, publications, and technical forums within the Australian Defence Organisation with the principal concern for Defence being an ethical use of AI in military applications, either for warfighting or rear-echelon domains, such as supply, logistics, healthcare, and personnel is '… avoidance of any adverse outcomes …'[72] and outlined by Devitt et al, with particular reference to the '…premature adoption [of AI] without sufficient research and analysis may result in inadvertent harms.'[73]

The Department of Defence identified 'trusted autonomous systems'[74] development as a strategic priority for the nation.[75] In the recent article *Navigating to Autonomy*, Massingham argues '…autonomy is not specifically regulated by either [Australian] domestic or international law ... [there are] no rules specifically dealing with autonomy as a concept … [and] no Autonomy Convention or Act.'[76] In addition, Massingham contends '… there is no specific Act of Parliament in Australia dealing with defence aviation or State aircraft, which includes military

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[70] JORDAN COX ET AL., AI, MACHINE LEARNING & BIG DATA LAWS AND REGULATIONS Jordan Cox et. a, *AI, Machine Learning & Big Data Laws and Regulations* 2022 | AUSTRALIA 8 (2022), https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/australia.
[71] *Id.*
[72] *Id.* at 9.
[73] KATE DEVITT ET AL., A METHOD FOR ETHICAL AI IN DEFENSE i, DEFENSE SCIENCE AND TECHNOLOGY GROUP (2021), https://www.dst.defence.gov.au/publication/ethical-ai.
[74] Trusted Autonomous Systems, https://tasdcrc.com.au/what-we-do/#projects (last visited Aug. 17, 2022).
[75] DEPARTMENT OF DEFENCE, 2016 DEFENCE INDUSTRY POLICY STATEMENT 31-32 (2016), https://www.defence.gov.au/sites/default/files/2021-08/2016-Defence-Industry-Policy-Statement_0.pdf
[76] Eve Massingham, *Navigating to Autonomy: Legal Questions in the Use of Autonomous Aerial Vehicles By the Australian Military*, 3 AUSTRALIAN J. DEF. & STRATEGIC STUD. 1, 6 (2021).

aircraft.'[77] This includes autonomous, remotely piloted aircraft (RPA) or unmanned aerial vehicles (UAVs), such as recent Commonwealth acquisitions and certification of the MQ-9B Sky Guardian, and the surveillance UAV, MQ-4C Triton.

From the intersection of international/domestic law, Massingham outlines where occurrences of '…[t]he use of force by military autonomous aerial vehicles … *The International Criminal Court Act 2002* (Cth)[78] and the *International Criminal Court (Consequential Amendments) Act 2002* (Cth)[79] which amended the [Criminal] Code…'[80] would be enlivened, and relate to the probable prosecution of international crimes, including any 'crimes committed by Australian Service personnel anywhere in the world during armed conflict in violation of the laws and customs of war.'[81] *Criminal Code,* Chapter 8 Subdivision D designated this as 'war crimes' and notes that 'War crimes that are grave breaches of the Geneva Convention and Protocol 1 to the Geneva Conventions'[82] are punishable by up to 25 years imprisonment.[83] Division 286 reflects the obligations under international law, Australia as a signatory to the Geneva Conventions of 1949, plus other international treaties prohibiting the 'use of specific means and methods of warfare during times of armed conflict.'[84]

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[77] *Id.* at 9; Civil Aviation Act 2, 1988 (Act No. 63/1988) (Austl.) (Section 3 Interpretation: 'state aircraft' means (a) aircraft of any part of the Defence Force including any aircraft that is commanded by a member of that Force in the course of duties as such a member; and (b) aircraft used in the military, customs or police services of a foreign country').

[78] International Criminal Court Act, 2002 (Act No. 41/2002) (Austl.).
[79] International Criminal Court (Consequential Amendments) Act, 2002 (Act No. 42/2002) (Austl.).
[80] Eve Massingham, *Navigating to Autonomy: Legal Questions in the Use of Autonomous Aerial Vehicles By the Australian Military*, 3 AUSTRALIAN J. DEF. & STRATEGIC STUD., 1, 14 (2021).
[81] Criminal Code Act § 268.29, 1995 (Act No. 38/1995) (Austl.).
[82] Criminal Code Act § 268.29(d), 1995 (Act No. 38/1995) (Austl.).
[83] Eve Massingham, *Navigating to Autonomy: Legal Questions in the Use of Autonomous Aerial Vehicles By the Australian Military*, 3 AUSTRALIAN J. DEF. & STRATEGIC STUD., 1, 14 (2021).
[84] *Id.* at 14; INTERNATIONAL COMMITTEE OF THE RED CROSS [ICRC], STATES PARTY TO THE FOLLOWING INTERNATIONAL HUMANITARIAN LAW AND OTHER RELATED TREATIES 7 (2023).

B. Australian Ethical Code for Use of AI in Defence and Lethal Applications

Australia has embarked on the journey of '…developing and promoting AI governance structures inclusive of Australian values, standards, ethical and legal frameworks.'[85] Devitt and Copeland outline significant AI initiatives undertaken at a national level by '…Australia's national research 18rganization, the CSIRO, Data 61; the Australian Government as represented by the Department of Industry Innovation and Science (2019) and the Department of Industry Science Energy and Resources (2020-2021); and the Defence Science and Technology Group, Royal Australian Air Force and Trusted Autonomous Systems in Defence (2021).'[86] A recent 2020 survey of national attitudes to AI, found 'Australians have low trust in AI Systems[87]…but many Australians trust research and Defence organisations to use AI[88] and the vast majority of Australians think AI regulation is needed'[89] which also validates European[90] and US[91] surveys demonstrating 'a strong desire for regulation.'[92] For governance of general AI, the Department of Industry (2019) released the AI Ethics Framework with eight guiding principles (Box 1.0) designed to ensure safer, secure, and reliable AI.[93]

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[85] SUSANNAH KATE DEVITT & DAMIEN COPELAND, AUSTRALIA'S APPROACH TO AI GOVERNANCE IN SECURITY AND DEFENCE 3 (2022).
[86] *Id.* at 3.
[87] *See* STEVE LOCKEY ET AL., TRUST IN ARTIFICIAL INTELLIGENCE: AUSTRALIAN INSIGHTS 10 (Univ. Queensl. & KPMG Austl. eds. 2020).
[88] *Id.* at 18.
[89] *Id.* at 24.
[90] *Id.*
[91] *Id.*
[92] *Id.*
[93] *See* AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, POSITIONING AUSTRALIA AS A LEADER IN DIGITAL ECONOMY REGULATION – AUTOMATED DECISION MAKING AND AI REGULATION 5 (2020); *see also* Artificial Intelligence, AUSTL. GOV'T DEP'T INDUS., SCI. RES., https://www.industry.gov.au/science-technology-and-innovation/technology/artificial-intelligence.

Box 1.0: Principles: *Source: Digital Technology Taskforce, Department of the Prime Minister and Cabinet (Issues Paper 2022)*[94]

- **Human, societal, and environmental wellbeing** – AI systems should benefit individuals, society, and environment
- **Human-centred values** – AI systems should respect human rights, diversity, and autonomy of individuals.
- **Fairness** – AI systems should be inclusive, accessible and should not involve or result in unfair discrimination against individuals, communities, or groups.
- **Privacy protection and security** – AI systems should respect and uphold privacy rights, data protection and ensure security of data.
- **Reliability and safety** – AI systems should reliably operate in accordance with intended purpose.
- **Transparency and explainability** – transparent and responsible disclosure so people understand when impacted by AI.
- **Contestability** – When AI significantly impacts a person, community, group, or environment, should be timely process to allow people to challenge use or outcomes of AI system.
- **Accountability** – People responsible for phases of AI systems lifecycle should be identifiable and accountable for outcomes of AI systems and human oversight be enabled.[95]

i. Method for Ethical AI in Defence (MEID) – Defence AI Ethics Framework[96]

The Department of Defence, moved to include the eight Australian ethics principles into its Defence Method for Ethical AI in Defence report[97] and as Devitt and Copeland contend, the Australian Government, '…has committed to AI Ethics Principles 2019 and the OECD Principles 2019 on AI, to promote AI that is innovative, trustworthy and that respects human rights and democratic values.'[98]

Australia, according to Devitt and Copeland, 'has not adopted an ethics framework specifically for AI use in Defence.'[99] However, Defence Science and Technology Group

[94] *See* AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, *supra* note 51 (indicating that these ethical pinciples are voluntary in nature an dcan be applied at each statge of AI systems lifecycle, as guidance to organisations to consider impact of AI systems).
[95] *Id.*
[96] KATE DEVITT ET AL., *A Method for Ethical AI in Defence*, AUSTL. GOV'T DEP'T DEF. (2020), https://www.dst.defence.gov.au/publication/ethical-ai.
[97] *Id.*
[98] DEVITT & COPELAND, *supra* note 85, at 20 (The US and Europe have also confirmed commitment to the OECD principles in a joint statement in 2021. The United States and European Union will develop and implement AI systems that are innovative and trustworthy and that respect universal human rights and shared democratic values, explore the cooperation on AI technologies designed to enhance privacy protections, and undertake an economic study examining the impact of AI on the future of our workforces); *U.S.-EU Establish Common Principles to Update the Rules for the 21st Century Economy at Inaugural Trade and Technology Council Meeting*, WHITE HOUSE: FACT SHEET, https://whitehouse.gov.
[99] DEVITT & COPELAND, *supra* note 85, at 43.

(DSTG) through the Technical Report 2021, recommended a method for ethical AI in Defence and identified five facets for ethical AI.[100] (Figure 1.0).

Figure 1.0 The five facets of ethical AI: *Source:* Technical Report | A Method for Ethical AI in Defence *(2021) <https://www.dst.defence.gov.au/publication/ethical-ai>*

- **Responsibility** – Who is responsible for AI?
- **Governance** – How is AI controlled?
- **Trust** – How can AI be trusted?
- **Law** – How can AI be used lawfully?
- **Traceability** – How are the actions of AI recorded? Australia has not

As to the questions of regulation of AI or development and adoption of a code for ethical use of AI in Defence and Military applications, Devitt and Copeland further outlined '… Australia has not released an overarching AI governance framework for Defence … and Australia is seeking to increase AI collaboration with the US and UK through AUKUS [strategic partnership].[101]

Moreover, in contrast to the US and UK, Devitt and Copeland point out '[t]he Australian Department of Defence has not formally adopted a Defence AI Roadmap or Strategy.[102] Australia has prioritised developing sovereign AI capabilities … robotics, autonomous systems, precision guided weapons, hypersonic weapons and integrated air and missile defence systems; space; and information warfare and cyber capabilities.'[103]

Regarding AI and Autonomous Weapons Systems, Australia does not support, and considers any '… sweeping prohibition of AWS to be premature…[rather] emphasises the

[100] *Id.* at 31.
[101] *Id.* at 21-22.
[102] *Id.* at 22.
[103] *Id.* at 22.

importance of legal obligation to undertake Article 36 reviews[104] to manage legal risks associated with these [AWS] systems.'[105] The Article 36 process is significant as it governs whether Australia is able to '… meet international legal obligations by way of operating autonomous weapons systems, and respective considerations, restrictions and prohibitions of weapons under of International Humanitarian Law, Customary International Law, such as the Martens Clause[106] and Law of Armed Conflict and rules governing lawful use of weapons such as distinction, proportionality and precautions in attack.'[107] (See Section IV for further details regarding governance- need infra citation).

There are differing views between the Government and the Senate whether '… existing international humanitarian law is sufficient to regulate current and envisaged weapons systems … firstly, article 36 weapon review process and secondly ADF system of control, which regulates the use of force by the ADF'[108] and the Commonwealth argues 'if states uphold existing international law obligations…there is no need to implement a specific ban on AWS at this time.'[109] The Senate Foreign Affairs, Defence and Trade Legislation Committee, however, was not convinced that '… the use of AWS should be solely governed by the law of armed conflict, international humanitarian law and existing arms control agreements.[110] A distinct arms control regime for AWS may be required in the future'[111] and further recommended the 'Australian

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[104] Protocol Additional to the Geneva Conventions art. 36, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I].
[105] DEVITT & COPELAND, *supra* note 85, at 22.
[106] Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (First Geneva Convention) art. 63, Aug. 12, 1949, 6 U.S.T. 3114, 75 U.N.T.S. 31 (This clause is recognised as a 'customary rule' in International Humanitarian Law and deals with the treatment of fighters who are not accorded prisoner-of-war status); Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (Second Geneva Convention) art. 62, Aug. 12, 1949, 6 U.S.T. 3217, 75 U.N.T.S. 85; Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention) art. 142, August 12, 1949, 6 U.S.T. 3316, 75 U.N.T.S. 135; Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention) art. 158, Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287; *1899 Hague Convention*, Preamble – *Convention with Respect to The Laws and Customs of War on Land (Hague II);* July 29, 1899 *(entered into force 4 September 1900).*
[107] DEVITT & COPELAND, *supra* note 85, at 23.
[108] *Id.* at 23-24.
[109] *Id.* at 24.
[110] *Id.*
[111] *Id.*

Government support international efforts to establish a regulatory regime for autonomous weapons systems.'[112]

IV. Governance

Abbott contends, 'Artificial intelligence may be the most disruptive and inventive technology ever created, but not guaranteed to improve lives. The way to ensure it does is through enacting appropriate laws and policies for AI.'[113]

A. International Humanitarian Law, Law of Armed Conflict, Use of Force, and Laws [114]

The Australian Defence Force (ADF) has maintained a 'strong record of compliance with applicable legal frameworks'[115] including international humanitarian law, '…particularly concepts of proportionality, distinction and military necessity, which have no non-military equivalent…'[116] and as we know, Article 2(4) of the UN Charter[117] prohibits States from engaging in 'unilateral' use of force to settle their disputes, in absence of prior UN Security Council authorisation.[118] During times of conflict, the ADF is required to comply with international humanitarian law (*lex specialis – jus in bello – one's rights while at war*)[119] which governs assessment of lawfulness of use of force against lawful targets (combatants) in armed conflict (*jus ad bellum – one's right to go to war, governing the resort to force*)[120] and international human rights law (*lex*

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[112] *Id.*
[113] ABBOTT, *supra* note 5, at 142.
[114] LAWS - Lethal Autonomous Weapons Systems.
[115] DEVITT ET AL., *supra* note 73, at 27.
[116] DEVITT & COPELAND, *supra* note 85, at 32.
[117] U.N. Charter art. 2, ¶ 4.
[118] M. DIXON ET AL., CASES AND MATERIAL ON INTERNATIONAL LAW 596 (6th ed., 2016).
[119] INT'L COMM. OF THE RED CROSS, *Lex specialis,* INT'L COMM. OF THE RED CROSS https://casebook.icrc.org/a_to_z/glossary/lex-specialis (noting "more specific rules will prevail over more general rules").
[120] INT'L COMM. OF THE RED CROSS, *What are jus ad bellum and jus in bello?,* INT'L COMM. OF THE RED CROSS https://www.icrc.org/en/document/what-are-jus-ad-bellum-and-jus-bello-0.

generalis).[121] 'Defence is required to comply with international legal norms with respect to the use of force when not engaged in armed conflict, when applying military force.'[122]

Docherty argues lethal autonomous weapon systems (LAWS) measures to implement Article 36 of Additional Protocol I of 1977[123] are the '…rules of distinction, proportionality, and military necessity, cornerstones of IHL, all of which are accepted as customary.'[124] Further, Docherty outlines that the 'requirement of distinction is arguably the bedrock principle of international humanitarian law…. [A]ccording to customary international law, articulated in Protocol I to the *Geneva Conventions*, combatants must "distinguish between the civilian population and combatants"[125] …IHL prohibits attacks which are disproportionate in nature' and Docherty refers to 'Protocol I [which] defines a disproportionate attack as one that "maybe expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects …" [and] requires subjective balancing of military and civilian impacts.'[126] Regarding military necessity, Docherty provides the example of 'attacking surrendering or wounded troops would be unlawful … as not essential for victory and expressly prohibited by the *Geneva Conventions*.'[127]

Walsh affirms *jus ad bellum* requires war be fought for 'just' cause, defensive in nature, declared by human-centred competent authority (governments)[128] and *jus in bello,* provides rules

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[121] INT'L COMM. OF THE RED CROSS*, supra* note 119, at 142.
[122] DEVITT & COPELAND*, supra* note 85, at 32.
[123] Protocol Additional to the Geneva Conventions, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I] (Refers alternately to "methods or means of warfare": Art. 35(1), (3) and Art. 51(5)(a); Art. 55(1)), "methods and means of warfare": titles of Part III and of Section I of Part III), "means and methods of attack"; Art. 57(2)(a)(ii)), and "weapon, means or method of warfare": Art. 36); see also 1907 Hague Regulations, Annex to the 1907 Hague Convention (IV) Respecting the Laws and Customs of War on Land, October 18, 1907, 36 Stat. 2277, T.S. No. 539.
[124] INT'L COMM. OF THE RED CROSS, *A Guide to the Legal Review of New Weapons, Means and Methods of* Warfare*,* INT'L COMM. OF THE RED CROSS https*://www.icrc.org/en/doc/assets/files/other/icrc_002_0902.pdf*.
[125] Docherty, *supra* note 43, at 2; Protocol Additional to the Geneva Conventions art. 48, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I]. INT'L COMM. OF THE RED CROSS, *Rule 1: The Principle of Distinction between Civilians and Combatants,* INT'L COMM. OF THE RED CROSS https://ihl-databases.icrc.org/en/customary-ihl/v1/rule1#Fn_3E28356C_00003.
[126] Protocol Additional to the Geneva Conventions art. 51(5)(b), June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol I].
[127] Geneva Convention Relative to the Protection of Civilian Persons in Time of War art. 3(1), adopted August 12, 1949, 75 U.N.T.S. 287; *Id.* at art. 41.
[128] WALSH, *supra* note 28, at 97.

of behaviour in war, governing conduct of war, focused on minimising suffering and protection of non-combatants.[129] (Table 4.0).

Table 4.0: Four principles of *Jus in bello* – Law of Armed Conflict

Source: adapted from International Committee of The Red Cross (ICRC) - <https://www.icrc.org/en/war-and-law/ihl-other-legal-regmies/jus-in-bello-jus-ad-bellum>[130]

***Jus in bello* - Principles**	**Description**
'*Humanity*' – The Martens Clause[131]	The Martens Clause requires war be fought according to laws of humanity and dictates of public conscience.[132]
'*Distinction'*	Combatants must distinguish between civilians, combatants, civilian objects, and military objectives – legitimate targets are military objectives only[133]
'*Proportionality'*	Seeks to limit damage caused by military operations and must not be disproportionate to military advantage sought.[134]
'Military Necessity'	Only measures permitted that are necessary to accomplish legitimate military purpose.[135]

Taking these IHL principles into account, Walsh contends 'lethal autonomous weapons systems fail to uphold all four principles of *jus in bello*, the conduct of war.'[136]

[129] *Id.* at 97.
[130] INT'L COMM. OF THE RED CROSS, *supra* note 120; WALSH, *supra* note 28, at 98; Docherty, *supra* note 43.
[131] Geneva Conventions I-IV, *supra* note 106 (Martens Clause is is recognised as a 'customary rule' in International Humanitarian Law and deals with the treatment of fighters who are not accorded prisoner-of-war status).
[132] WALSH, *supra* note 28, at 98.
[133] *Id.* at 98.
[134] INT'L COMM. OF THE RED CROSS, *Rule 14: Proportionality in Attack*, INT'L COMM. OF THE RED CROSS http://www.icrc.org/customary-ihl/eng/docs/v1_rul_rule14; Docherty, *supra* note 43.
[135] INT'L COMM. OF THE RED CROSS, *Principle of Military Necessity*, INT'L COMM. OF THE RED CROSS https://casebook.icrc.org/glossary/military-necessity.
[136] WALSH, *supra* note 28, at 99.

B. European Advancements in Regulatory for AI in Lethal Applications

The European Commission proposed regulation (known as the Artificial Intelligence Act[137]) to provide 'harmonised rules on artificial intelligence …a first legal framework on AI to address risks of AI … [and] positions Europe to play a leading global role.'[138] Unfortunately, as laid down in the Explanatory Memorandum for draft legislation, military AI is not accounted for, and clause 12 states '… AI Systems exclusively developed or used for military purposes should be excluded from the scope of this Regulation…'[139] and further at Article 2 clause 3, '[t]his Regulation shall not apply to AI systems developed or used exclusively for military purposes.'[140]

The European Parliament maintains its stance on lethal autonomous weapons systems and Members of the European Parliament (MEPS) reiterated their agreement '… lethal autonomous weapons systems (LAWS) should only be used as a last resort and be deemed lawful only if subject to human control, since it must be humans that decides between life and death.'[141] In March 2022, the European Centre for Not-for-Profit Law (ENCL) submitted proposals for EU AI Act amendments calling for 'clear safeguards for AI systems for Military and National Security purposes.'[142] However, it may take several years for the Draft AI legislation to pass the European Parliament and become law.

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[137] EUR. PARL., *EU Legislation in Progress: Artificial Intelligence Act*, EUR. UNION https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206; EUR. UNION, *Artificial Intelligence Act,* EUR. UNION, https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698792/EPRS_BRI(2021)698792_EN.pdf.
[138] EUR. COMM'N, *Shaping Europe's digital future*, EUR. UNION https://digital-strategy.ec.europa.eu/en/library/proposal-regulation-laying-down-harmonised-rules-artificial-intelligence.
[139] EUR. COMM'N, *Artificial Intelligence Act*, EUR. UNION https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206 (The proposed EU AI Act has received over 3000 amendments in the European Parliament's committees); Commission Regulation 2021/206.
[140] Commission Regulation 2021/206, art. 2(3).
[141] EUR. PARL., *Artificial Intelligence: Guidelines For Military and Non-Military Use*, EUR. UNION https://www.europarl.europa.eu/news/en/press-room/20201209IPR93411/artificial-intelligence-guidelines-for-military-and-non-military-use; EUR. PARL., *Joint Motion for a Resolution on the use of armed drones,* EUR. UNION https://www.europarl.europa.eu/doceo/document/RC-7-2014-0201_EN.html; EUR. PARL., *European Parliament resolution of 12 September 2018 on autonomous weapon systems,* EUR. UNION https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018IP0341&from=EN.
[142] EUR. CTR. NOT-FOR-PROFIT L., *EU AI Act Needs Clear Safeguards for AI Systems For Military and National Security Purposes*, EUR. CTR. NOT-FOR-PROFIT L. https://ecnl.org/news/eu-ai-act-needs-clear-safeguards-ai-systems-military-and-national-security-purposes.

The United Kingdom (UK) has established its Defence AI Strategy,[143] published in June 2022, setting out how the Ministry of Defence (MoD) will adopt and exploit AI in military use, with MoD outlining it will work in close partnership with the private sector to '…prioritise research, development and experimentation in AI to "revolutionise our Armed Forces capabilities" [and aims to make the MoD] "the most effective, efficient, trusted and influential Defence organisation for our size" when it comes to AI.'[144] According to the UK Defence AI Policy statement, the MoD confirmed 'deployment of AI-enabled capabilities in armed conflict needs to comply fully with IHL, satisfying four core principles of distinction, necessity, humanity and proportionality…any system or weapon which does not satisfy these fundamental principles would constitute a breach of international law.'[145] In relation to LAWS, the UK affirms '…it does not possess fully autonomous weapons systems and has no intention of developing them.'[146] The UK MoD has advised it is working in partnership with the United States and Australia (under AUKUS partnership), Canada and New Zealand (Five Eyes partnership), NATO institutions, and nations in collaborative AI partnerships.[147]

In December 2021, the 9th meeting, 6th Review Conference of High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons (CCW)[148] occurred in Geneva, of which Australia is a signatory, with partners seeking to establish new rules for the development and use of LAWS. Importantly, a 'majority of nations party to the Convention were in favour of restriction (80 of 125 nations, with 30 advocating for a specific

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[143] U.K. MINISTRY OF DEF., *Defence Artificial Intelligence Strategy*, U.K. MINISTRY OF DEF. https://www.gov.uk/government/publications/defence-artificial-intelligence-strategy/defence-artificial-intelligence-strategy.
[144] Sebastian Klovig Skelton, *MoD Sets Out Strategy to Develop Military AI with Private Sector*, Computer Weekly (June 17, 2022), https://www.computerweekly.com/news/252521624/MoD-sets-out-strategy-to-develop-military-AI-with-private-sector.
[145] U.K. MINISTRY OF DEF., *Defence Artificial Intelligence Strategy,* U.K. MINISTRY OF DEF. https://www.gov.uk/government/publications/ambitious-safe-responsible-our-approach-to-the-delivery-of-ai-enabled-capability-in-defence/ambitious-safe-responsible-our-approach-to-the-delivery-of-ai-enabled-capability-in-defence.
[146] *Id.* at Annex C.
[147] U.K. MINISTRY OF DEF., *supra* note 143.
[148] *9th Meeting, 6th Review Conference of High Contracting Parties* (UN Web TV broadcast 2021).

LAWS ban treaty) … opposed by a minority of states … including Russia, US, Israel and India…despite a majority consensus the [CCW] conference failed in providing a response to the need for regulation.'[149]

C. US Advancements in Regulatory Frameworks for AI in Lethal Applications

AI regulation in the US is still in the formative stages, and while there is no comprehensive US federal legislation on AI,[150] the US Congress is considering several items of legislation and recently the US announced an AI strategy (2019), to use 'artificial intelligence in many areas of the military, including intelligence analysis, decision making, vehicle autonomy, logistics, and weaponry.'[151] The US DOD outlines it will '…articulate its vision and guiding principles for using AI in a lawful and ethical manner to promote our values…also seek opportunities to use AI to reduce unintentional harm and collateral damage via increased situational awareness and enhanced decision support'[152] and further sets out '…[o]ther nations, particularly China and Russia, are making significant investments in AI for military purposes, including in applications that raise questions regarding international norms and human rights…investments which threaten to erode [US] technological and operational advantages and destabilize (sic) the free and open international order.'[153]

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[149] Coralie Consigny, *Are Killer Robots Better Soldiers?: The Legality and Ethics Of The Use of AI At War*, Human Rights Pulse (Feb 8, 2022), https://www.humanrightspulse.com/mastercontentblog/are-killer-robots-better-soldiers-the-legality-and-ethics-of-the-use-of-ai-at-war; U.N. OFF. FOR DISARMAMENT AFF., *Background on LAWS in the CCW*, U.N. OFF. FOR DISARMAMENT AFF. https://www.un.org/disarmament/the-convention-on-certain-conventional-weapons/background-on-laws-in-the-ccw/.

[150] Louis Lehot, *United States: Artificial Intelligence Comparative Guide*, Foley (Apr. 21, 2022), https://www.foley.com/en/insights/publications/2021/04/united-states-artificial-intelligence-guide.

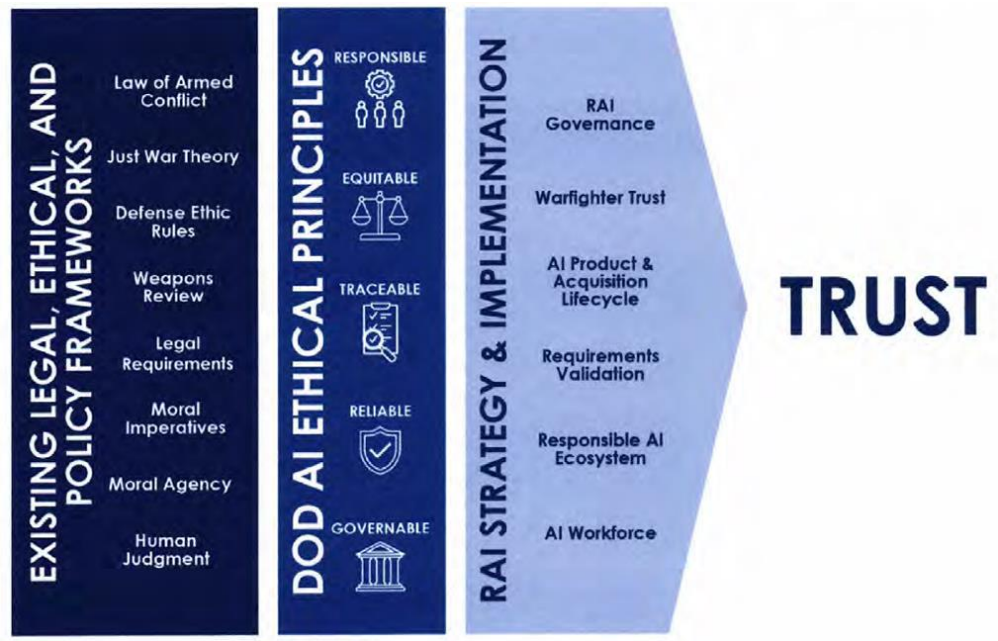
[151] Terri Moon Crook, *DOD Unveils Its Artificial Intelligence Strategy*, U.S. DEP'T OF DEF., (Feb. 12, 2019), https://www.defense.gov/News/News-Stories/Article/Article/1755942/dod-unveils-its-artificial-intelligence-strategy/; U.S. DEP'T OF DEF., *Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our security and Prosperity,* U.S. DEP'T OF DEF. https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF.

[152] U.S. DEP'T OF DEF., *Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our security and Prosperity* 8, U.S. DEP'T OF DEF. https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF> (DOD is taking initiative immediate action to realize the benefits of AI).

[153] *Id.* at 5.

The Pentagon makes it clear the US and its allies 'must adopt AI to maintain strategic position, prevail on future battlefields and safeguard order'[154] and in June 2022, the Pentagon released its Responsible Artificial Intelligence Strategy for its implementation strategy for responsible AI principles.[155] The US strategy is to 'lead in military ethics and AI safety', the [US] DOD will earn the trust of Service members, civilian personnel and citizens… to encourage Responsible AI [RAI] development and use globally… to solve modern defense (sic) challenges with allies and partners around the world.[156] The desired end state of the RAI strategy is illustrated in the graphic provided in the publication. (Figure 2.0).

Figure 2.0 Overview depicting US DOD RAI Journey to Trusts: *Source:* US DOD Responsible Artificial Intelligence Strategy (2022) < *https://www.ai.mil/docs/RAI_Strategy_and_Implementation_Pathway_6-21-22.pdf*>[157]



[154] *Id.*
[155] Kathleen Hicks, *Responsible Artificial Intelligence Strategy*, 2022, U.S. DEP'T OF DEF. https://www.ai.mil/docs/RAI_Strategy_and_Implementation_Pathway_6-21-22.pdf.
[156] *Id.* at 2.
[157] *Id.* at 7.

In other developments, the US Congress signed into law the *National AI Initiative Act of 2020* (DIVISION E, SEC. 5001) on 1 January 2021 (NAIIA 2020), to provide a coordinated program across all US Federal Government to accelerate AI research and application for the Nation's economic prosperity and national security.[158]

The NAIIA (2020) embeds provisions on prohibited procurement, certification requirements and compliance with the Law of Armed Conflict, including 'limitation and prohibition of procurement of large, unmanned surface vessels and inclusion of offensive weapons systems in such vessels, until technology maturity certification has been submitted to US Congress and the Secretary of Defense certifies how the weapons systems will comply with the Law of Armed Conflict.'[159]

The US Department of Defense Joint AI Center (JAIC) in September 2020, convened an inaugural meeting of the multilateral 'AI Partnership for Defense' in pursuit of values-based global leadership in defence and promote responsible AI policies, approaches, and best practices in AI ethics implementation. Military and Defence delegations from Australia, Canada, UK, and many NATO countries attended/joined the AI Partnership for Defence.[160]

In October 2022, the White House released President Biden's Blueprint of an AI Bill of Rights, to '…guide the design, use, and deployment of automated systems to protect the American public in the age of artificial intelligence…'[161] and sets a progressive tone for the

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[158] NAT'L ARTIFICIAL INTEL. INITIATIVE OFF., *National Artificial Intelligence Initiative*, NAT'L ARTIFICIAL INTEL. INITIATIVE OFF. ai.gov/; National Artificial Intelligence Initiative Act of 2020, H.R. 6216, 116th Cong. (2020).
[159] William M. Thornberry, *Nat'l Def. Authorization Act for Fiscal Year* 2021, U.S. GOV'T PUBL'N OFF. at §§ 122, 127, https://www.govinfo.gov/content/pkg/PLAW-116publ283/html/PLAW-116publ283.htm (last visited Sept. 17, 2022).
[160] *A.I. Partnership for Defense*, NAT'L ARTIFICIAL INTEL. INITIATIVE OFF. https://www.ai.gov/strategic-pillars/international-cooperation/#AI_Partnership_for_Defense (last visited Sep. 20, 2022) (explaining that the Partnership for Defense has 16 member nations including Australia, Canada, Denmark, Estonia, France, Finland, Germany, Israel, Japan, the Republic of Korea, Norway, the Netherlands, Singapore, Sweden, UK, and US).
[161] *Blueprint for an A.I. Bill Of Rights: Making Automated Systems Work for The American People*, THE WHITE HOUSE, https://www.whitehouse.gov/ostp/ai-bill-of-rights/ (last visited Sept. 24, 2022).

continued advancements trustworthy and responsible AI for the US and its allies and global partners.

D. Future Direction of Australian Regulation of AI in Lethal Applications

Federal Court Justice Perry speaking in January 2017, at Supreme and Federal Court Judges' Conference in Perth provided an address titled '*Automated Weaponry and Artificial Intelligence: Implications for the Rule of Law*'[162] where Perry J confirmed at that time, '…no international treaties deal specifically with automated or autonomous weapon systems … and as the *International Court of Justice* held in advising on legality and use of nuclear weapons, "*would be incompatible with the intrinsically humanitarian character of the legal principles … entire law of armed conflict and applies to all forms of warfare and to all kinds of weapons, those of the past, those of the present and those of the future"*[163] and obligations which Australia is signatory to, '… Article 36 of Additional Protocol I to the Geneva Convention on parties to determine whether a weapon or new method of warfare would be prohibited under Protocol I or any other rule of international law.'[164] Justice Perry argues in favour of '…the imperative for the global community to define with precision the limits which constrain the development and deployment of automated and autonomous weapons.'[165]

Further, according to attitudinal research conducted by Lockey et al, a significant '…majority (96%) of the Australian community expect AI to be regulated. However, many view the current regulatory and legal framework as insufficient to make AI use safe and protect people from risks.'[166] Notably, Lockey et al identified the 'adoption of assurance mechanisms

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[162] Melissa Perry, J., *Automated Weaponry and A.I: Implications for the Rule of Law*, FED. JUD. SCHOLARSHIP (Jan. 25, 2017), http://classic.austlii.edu.au/au/journals/FedJSchol/2017/1.html (last visited Oct. 21, 2022).
[163] *Id.*; Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 ICJ 226 ¶ 86 (Jul. 8).
[164] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 ICJ 226 ¶ 86 (Jul. 8); Protocol I, *supra* note 104.
[165] Perry, J., *supra* note 162.
[166] *See* STEVE LOCKEY ET AL., *supra* note 2, at 51.

supporting ethical deployment of AI systems will build public trust.'[167] The key is 'establishing independent AI ethics reviews, adopting codes of conduct and national standards and obtaining AI ethics certifications.'[168] This is equally important in military use of AI, as in civil and industrial uses of AI. In fact, the greater majority of AI-enabled systems in military weaponry and rear-echelon systems are produced by Defence industry and COTS/MOTS[169] suppliers to Defence.

Having identified the need for regulation of AI in lethal application, this author contends that Australia needs to provide clear, unequivocal regulation of AI in Military Use in domestic laws in relation to Defence functions and associated ethics and policy guidance to ensure the nation continues to achieve legal certainty in this rapidly expanding and critical area for sovereign capability and national security.

Guihot and Bennett Moses, providing wise counsel note that '…the constraints of existing laws, … should further change to adapt to these rapidly evolving technologies.'[170]

V. CONCLUSION

Russia's invasion of Ukraine of 24 February 2022 saw widespread violations of the international law of armed conflict in general committed by Russia. With respect to drones and the use of UAVs, the potential contravention of Protocol I, art 51(5)(b)[171] by Russia is evident and escalated by the recent deployment of mass swarms 'kamikaze' attack drones[172] heightening the need to focus on regulation of AI-enabled autonomous weapons systems as a matter of

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[167] *Id.*
[168] *Id.*
[169] COTS/MOTS – Commercial off the Shelf / Military Off the Shelf, referring to commercially or military industry developed products which may have Ai enabled systems powering certain elements of the delivered materiel systems.
[170] MICHAEL GUIHOT & LYRIA BENNETT MOSES, *supra* note 9.
[171] Protocol I, *supra* note 104, at art. 51(5)(b).
[172] Sanjana Varghese, *Mass drone attacks in Ukraine foreshadow the 'future of warfare'*, ALJAZEERA (October 20, 2022), https://www.aljazeera.com/news/2022/10/20/mass-drones-are-a-worry-for-the-future-of-warfare (explaining that deployed drones are Iranian made Shahed-136 'kamikaze' explosive-laden drones).

importance. AI-enabled systems must be used lawfully and are increasingly impacting military war-fighting functions.[173] Ryan outlines the multiplier effect of pervasive battlefield AI, which 'offer[s] multiple possibilities for decision support at the tactical level of war ... [u]sing human-in-the-loop and human-on -the-loop systems, AI, may be applied for rapid decision-making'[174] thereby 'augment[ing] human cognitive functions'[175] for the detection of and defensive action against new and emerging battlefield lethality threat to combatants and civilians. Equally, military tactical field operations are accelerating, and '… the quantity of information continues to increase, the capacity of humans to deal with it is not keeping pace;'[176] therefore, it is vital that coalition military forces lawfully deploy AI-enabled systems, to secure tactical advantage on the modern battlefield.

Regarding the need for regulation, Bennett Moses argues that the '… regulatory environment for new technologies, such as AI and robots, is complex and requires understanding of the type of technology involved …[r]egulators must have a thorough knowledge of the technology and the environment in which it is implemented, if a regulatory response is to be effective'[177] which is crucial for lawmakers to rapidly increase their knowledge of AI technologies in these fields.

It is imperative that robust regulatory strategy be developed by the Australian Government, necessitating need for significant stakeholder consultation, to ensure properly considered regulatory frameworks are designed and deployed, while mitigating the risk of unforeseen consequences through this legislative process.

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[173] MICK RYAN, WAR TRANSFORMED: THE FUTURE OF TWENTY-FIRST-CENTURY GREAT POWER COMPETITION AND CONFLICT 43 (Naval Inst. Press, 2022).
[174] *Id.*
[175] *Id.* at 105.
[176] *Id.* at 104.
[177] Bennett Moses, *Agents of Change: How the Law "Copes" with Technological Change*, 20 GRIFFITH L. REV. 763 (2011).

Notably, Australia's OBPR cautions '…regulation can have benefits, but poor, unnecessary or excessive regulation can also lead to obstacles that slow down and even stop business investment and new job creation.'[178] It is vital to establish the right balance between ethical code(s) and frameworks with use of legislative instruments delivering the most effective governance of AI developments in military and lethal applications. In that regard, this author suggests, the Commonwealth consider what international regulatory approaches may be valid for the Australian context and ensure these do not hamper Australian domestic interests.

In relation to AI-enabled autonomous weapon systems, Massingham contends, '… [s]pecific regulation in the future is a possibility, but for now it seems unlikely that States would agree to a treaty regulating autonomous weapons systems given their differing views'[179] which confirm this author's opinion that Australian lawmakers embrace the need for regulation of AI in lethal applications in military use.

And in conclusion and by taking a possible contrary stance to regulation of AI technology, Abbott challenges the default position stating, 'Our challenge then, may be less about how to regulate AI and more about how to regulate ourselves.'[180]

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[178] AUSTRALIAN GOV'T, DEP'T OF THE PRIME MINISTER AND CABINET, *supra* note 48.
[179] Eve Massingham, *supra* note 76, at 15.
[180] ABBOTT, *supra* note 5, at 143.