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The Geddes Papers

The Geddes Papers are named for Brigadier Ian Geddes who, in a distinguished 37 year career in the Australian Army, saw active service in WWII, Korea, Malaya and Vietnam. Brigadier Geddes was also a graduate of the Royal Military College, Duntroon, the first course of the Army Staff College at Fort Queenscliff in Victoria and the United Kingdom's Imperial Defence College (now the Royal College of Defence Studies). Unusually for an Australian officer of his time, his career combined the practical experience of war with a broad professional military education.

It was because of his education that, in 1970, Geddes was selected as the inaugural Director of the Joint Services Wing (JSW) of the Australian Services Staff College in Canberra. Between 1970 and 1972, he and his team were highly successful in their task of setting the new institution on a sound educational footing. In July 1972, the JSW changed its name to the Australian Joint Services Staff College (JSSC).

In 2001, the three single service staff colleges were collocated in Canberra on the site of the JSSC, as the Australian Command and Staff College (ACSC). In 2019, the Australian War College was established to bring professional military education conducted at Weston Creek under one banner. The Australian Command and Staff College was renamed the Australian Command and Staff Course. Today the AWC is a centre for excellence in the education of selected career officers for command and staff appointments at the O-6 and O-5 levels in single Service, joint and integrated environments.

The Geddes Papers are produced by the Australian Defence College on behalf of the Commandant of the Australian War College. These papers represent the best student essays of the previous year's ACSC (Military Art) intake and are selected to represent a variety of opinions from students attending the ACSC(MA), both residential and Part Time programs.

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Deterrence and the case for Australian Industry Policy

Major Andrew Buckley

Major Andrew Buckley is a full-time Army Officer in the Royal Australian Electrical and mechanical Engineers, and is a graduate of the Australian Command and Staff Course (Military Art) class of 2024. His background is in combat service support roles in the Army Aviation and Defence Uncrewed Aerial Systems capabilities.

Introduction

Industry policy is experiencing a renaissance among countries seeking to enhance their economic security. Originating as policies that promoted domestic manufacturing industries, today industry (or industrial) policy refers to targeted assistance to the private sector to address specific challenges, where market forces alone are insufficient to reshape economic activity in response.¹ Whether or not governments should intervene in otherwise free markets has been a controversial subject in economics, but this dichotomy is increasingly giving way to consideration of how best to intervene.² Numerous challenges, including ‘the green transition,’ and supply chain assurance are behind a renewed interest in these policies.³ Prominent among these challenges, is the intersection of economic security and US-China competition. For many states, globalisation and the emergence of a multipolar world are creating connected economic and national security concerns.⁴ These geopolitical challenges are displacing ideological opposition to industry policy and countries are beginning to employ it explicitly for their own security.⁵

Australia’s strategic environment is marked by a similar concern for the impact of great power competition on its interconnected economy. The 2023 Defence Strategic Review (the DSR) describes significant challenges for Australia and its near region, including economic coercion. The DSR affirms Australia’s interest in protecting the “global rules-based order upon which international trade depends.”⁶ Geoeconomic competition and

¹ OECD, ‘Industrial Policy’, OECD, accessed 27 September 2024, <https://www.oecd.org/en/topics/policy-issues/industrial-policy.html>; Réka Juhász, Nathan Lane, and Dani Rodrik, ‘The New Economics of Industrial Policy’, *Annual Review of Economics*, August 2023, 4, <https://doi.org/10.1146/annurev-economics-081023-024638>.

² Juhász, Lane, and Rodrik, ‘The New Economics of Industrial Policy’, 2.

³ Alex Muresianu, ‘Tax Cuts and Jobs Act, Inflation Reduction Act, CHIPS Act: Comparing and Contrasting the New Industrial Policy’, *States News Service*, 8 March 2024, Gale Academic OneFile; Juhász, Lane, and Rodrik, ‘The New Economics of Industrial Policy’, 2; Mark Dean and Shirley Jackson, ‘Industry Policy’, *Journal of Australian Political Economy*, no. 92 (2024): 148.

⁴ Fernando Santiago, Nobuya Haraguchi, and Alejandro Lavopa, ‘Global Trends and World Order: Implications for New Industrial Policies in Developing Countries’, *Journal of Industry, Competition and Trade* 24, no. 1 (December 2024): 4, <https://doi.org/10.1007/s10842-024-00419-4>.

⁵ Santiago, Haraguchi, and Lavopa, 1–2; Alex Robson, ‘Optimal Industry Policy - Speech’, 30 August 2023, <https://www.pc.gov.au/media-speeches/speeches/optimal-industry-policy>.

⁶ Department of Defence, ‘National Defence: Defence Strategic Review 2023’, Website, 5, accessed 18 February 2024, <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>.

the desire to sustain an open global economy had already featured in the 2017 Foreign Policy White Paper.⁷ However, with the DSR came the idea that the strategic circumstances “demand that we deploy all elements of our national power in statecraft.”⁸ This is emblematic of a transition to the new conceptual approach of *National Defence* which demands a whole-of-government and whole-of-nation approach to deter coercion by denial.⁹ While the strategic end is made clear, the means to achieve it are not; exactly what ‘all elements of national power in statecraft’ might include, is not stated.

Restructuring economic activity seems an intuitive way of denying economic coercion, and the Australian Government has affirmed support for the employment of industry policies in a transparent, good-faith manner for legitimate objectives.¹⁰ Despite this, industry policy is not explicitly called out as a component of Australia’s deterrence strategy. This raises the question – if economic tools can have a deterrent effect, how might the Australian Government employ industry policy to support its strategy of deterrence by denial? The DSR, and the National Defence Strategy (the NDS) that followed, propose measures that suggest the use of industry policy might be needed, but they stop short of saying such policies are candidate tools of economic statecraft. They are instead outlined as part of a strategy to enhance resilience, and resilience is claimed to be a means for deterrence. If resilience can indeed have a deterrent effect, then government shaping of economic activity that seeks to improve resilience should, by extension, support deterrence.

This paper argues that the Australian Government should employ industry policy as part of an explicit, whole-of-nation approach to deterrence by denial. It first explores the emergence of economic tools of deterrence, and the current state of Australian industry policy. This review highlights the conception of deterrence through resilience that is shared by *National Defence* and the nascent *Future Made in Australia* industry policy. This paper argues that resilience has the potential to deter, and that Australia should embrace a whole-of-nation approach to enhance resilience. This paper then argues that it makes sense for Australia to employ industry policy as part of this whole-of-nation approach. It makes the case for industry policy to be employed in a way that enhances resilience while minimising risks to Australia’s competitiveness in trade. Finally, this paper argues that for Australian industry policy to be an effective deterrent, it must be employed as part of a coherent strategy and the intent must be clearly communicated. This work does not challenge the ‘global rules-based order’ rhetoric or the need for a deterrence strategy. It accepts *National Defence* as a premise, and instead seeks to explore the potential for economic restructure to support the strategy.

Literature Review: Economics in Deterrence, and Australian Industry Policy

The evolution of deterrence strategies has resulted in a growing focus on denial, and the role of non-military tools of statecraft. Contemporary work to update deterrence theory

⁷ Australian Government, ‘Foreign Policy White Paper’, Text, Foreign Policy White Paper (Foreign Policy White Paper, 2017), 44, <https://www.dfat.gov.au/sites/default/files/2017-foreign-policy-white-paper.pdf>.

⁸ Department of Defence, ‘National Defence’, 6.

⁹ Department of Defence, 18, 32.

¹⁰ Joint Statement, ‘Joint Declaration Against Trade-Related Economic Coercion and Non-Market Policies and Practices’, 9 June 2023, <https://www.foreignminister.gov.au/minister/penny-wong/media-release/joint-declaration-against-trade-related-economic-coercion-and-non-market-policies-and-practices>.

has been carried out by Michael J. Mazarr, a senior political specialist at the RAND corporation, who refers to deterrence as the challenge of “discouraging states from taking unwanted actions, especially military aggression.”¹¹ This work is motivated by the re-emergence of deterrence as a central component of many countries’ defence policies. The theory’s prominence during the Cold War relied upon assured destruction to dissuade conflict by threat of punishment.¹² Since then, changes in deterrence strategies have resulted in the emergence of deterrence by denial.

Reviewing the vast literature, Mazarr and colleagues distinguish between practicing deterrence by threatening severe punishments for engaging in aggression (deterrence by punishment), and by denying an aggressor the means to attack through credible defensive measures (deterrence by denial).¹³ This language illustrates the common military-centric conception of the strategy. Nevertheless, Mazarr argues that changes in the international security environment have changed the context for deterrence.¹⁴ While narrow conceptions of deterrence using only military tools of statecraft remain common, there are compelling geopolitical reasons to take a broader view of deterrence that involves all tools of statecraft.¹⁵

Despite this, the role of economics in a whole-of-government strategy of deterrence by denial is not prominent in the literature. In ‘Understanding Deterrence,’ Mazarr only refers to economics when highlighting the ability to deter by threat of sanction (a punishment).¹⁶ In a RUSI article, Wirtz and Larsen critique the US’ Integrated Deterrence concept, citing a commentator’s view that the DoD should not be the lead on economic sanctions.¹⁷ Even the limited coverage of ‘economic deterrence’ by denial has tethered the concept to the military, with one paper arguing that its aim is to threaten to reduce the likelihood of military success.¹⁸ These conceptions are not inherently problematic, but are limiting if economic means are intended to deny hybrid threats and non-military aggressions like economic coercion or other conflict short of war. Observing a broader view of deterrence, Mazarr has referred to denial strategies as seeking “to deter an action by making it infeasible or unlikely to succeed, thus denying a potential aggressor confidence in attaining its objectives.”¹⁹ He also contrasts immediate deterrence which represents crisis-like, urgent efforts to prevent an attack, with general deterrence, which is “the ongoing, persistent effort to prevent unwanted actions over the long term and in noncrisis situations.”²⁰ This expanded understanding of how a deterrent effect can be achieved,

¹¹ Michael J. Mazarr, *Understanding Deterrence* (Santa Monica, CA: RAND Corporation, 2018), 1, <https://doi.org/10.7249/PE295>.

¹² Robert Peters, Justin Anderson, and Harrison Menke, ‘Deterrence in the 21st Century: Integrating Nuclear and Conventional Force’, 2018, 16; Tim Prior, ‘Resilience: The “Fifth Wave” in the Evolution of Deterrence’, 12 April 2019, <https://css.ethz.ch/en/services/digital-library/articles/article.html>.

¹³ Michael J. Mazarr et al., *What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression* (Santa Monica, CA: RAND Corporation, 2018), 2, <https://doi.org/10.7249/RR2451>.

¹⁴ Mazarr, *Understanding Deterrence*, 1.

¹⁵ Mazarr et al., *What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression*, 3–4.

¹⁶ Mazarr, *Understanding Deterrence*, 2, 4.

¹⁷ James Wirtz and Jeffrey Larsen, ‘Who Does Deterrence?’, *The RUSI Journal* 168, no. 6 (19 September 2023): 17, <https://doi.org/10.1080/03071847.2023.2288133>.

¹⁸ Dong Jung Kim, ‘Economic Deterrence Through Economic Engagement’, *Foreign Policy Analysis* 15, no. 2 (1 April 2019): 178, <https://doi.org/10.1093/fpa/ory001>.

¹⁹ Mazarr, *Understanding Deterrence*, 2.

²⁰ Mazarr, 4.

potentially without the threat of punishment or military action, creates the space for economic tools to be used in a deterrence strategy. Economic tools would best support deterrence by denial if used as general deterrents whose goals is to prevent a crisis.

While deterrence is a re-emerging strategy for some countries, it is a new approach to Australia's defence posture. In a 2023 paper and related article on archipelagic deterrence, Australian National University senior lecturer, Dr Andrew Carr, explains that Australia has only recently settled on deterrence by denial as a strategy.²¹ As a result, there remain questions about the approach, and the role of economic levers. In his paper, Dr Carr explains two apparent issues with this new approach as outlined in the DSR, through the lens of what is often termed the 'three-Cs' of deterrence – credibility, capability, and communication.²² Excepting what he calls an inherently credible strategy, he first argues that while the DSR recognises that deterrence exists in an adversary's state of mind, it does not say who is being deterred.²³ This is particularly important given Mazarr's conclusion that the perceptions of the potential aggressor are the dominant variable in deterrence's success or failure.²⁴ Second, he argues that despite the strategy resting on capability, "Australia's capabilities appear tenuous."²⁵ While his assessment was of the Australian Defence Force, it is a sound warning for the other candidate elements of national power in statecraft. Given Australia's recent adoption of a deterrence by denial strategy, coupled with the limited coverage of economic means of denial in the literature, it is perhaps no surprise that economic tools of statecraft, like industry policy, are capabilities in waiting.

Industry policy has not been a prominent tool of Australian economic statecraft, and there have been no notable calls for it to be employed broadly for deterrence. The Lowy Institute Poll 2024 highlights that Australian governments since the 1980s have largely adhered to a free market approach to shaping the economy, and that this enjoys strong support in Australia.²⁶ The strong support for free trade in Australia correlates with the long-held view that industry policy involves governments inefficiently 'picking winners' and promoting uncompetitive industries.²⁷ Nevertheless, interest in industry policy is growing along with the realisation that a level of government intervention is necessary to aid imperfect market forces, and as arguments against intervention are challenged by

²¹ Andrew Carr, 'Australia's New Defence Era: Archipelagic Deterrence', *The Strategist*, 28 August 2023, <https://www.aspistrategist.org.au/australias-new-defence-era-archipelagic-deterrence/>; Andrew Carr, 'Australia's Archipelagic Deterrence', *Survival* 65, no. 4 (4 July 2023): 84, <https://doi.org/10.1080/00396338.2023.2239058>.

²² Peters, Anderson, and Menke, 'Deterrence in the 21st Century: Integrating Nuclear and Conventional Force', 17; Matthew P. Anderson, 'NATO Nuclear Deterrence: The Warsaw Summit and Beyond', *Connections: The Quarterly Journal* 15, no. 4 (2016): 5–30, <https://doi.org/10.11610/Connections.15.4.01>.

²³ Carr, 'Australia's Archipelagic Deterrence', 94.

²⁴ Mazarr, *Understanding Deterrence*, 7.

²⁵ Carr, 'Australia's Archipelagic Deterrence', 94.

²⁶ Ryan Neelam, '2024 Report: Economy and Trade - Lowy Institute Poll', Lowy Institute Poll 2024, sec. Free trade, accessed 29 July 2024, <https://poll.lowyinstitute.org/report/2024/economy-and-trade/#report>.

²⁷ Becky Bathgate, 'New Industrial Policy: A Future Made in Australia', text, sec. The industrial policy pendulum, Australia, accessed 10 September 2024, https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/Budget/reviews/2024-25/NewIndustryPolicy; Dean and Jackson, 'Industry Policy', 148; Mark Dean et al., 'Industrial Policy-Making after COVID-19: Manufacturing, Innovation and Sustainability', *The Economic and Labour Relations Review* 32, no. 2 (June 2021): 298, <https://doi.org/10.1177/10353046211014755>.

modern approaches.²⁸ In addition, industry policy has become a candidate tool for supporting societal goals.²⁹ A recent study defines industry policy as “those government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal.”³⁰ However, deterrence is rarely one of these public goals, which further contributes to the disconnect between the two ideas in the literature. Recent efforts by the Asia-Pacific Development, Diplomacy & Defence Dialogue (AP4D) to address the whole-of-nation, all tools of statecraft deterrence challenge do not advocate for industry policy as an option.³¹ In the few places that industry policy is discussed alongside deterrence, the former is typically linked to the defence industrial base. In keeping with the theme of military-centric deterrence, Head of Shoal Group Graeme Dunk’s argument for industry policy focuses on assuring a military deterrent capability.³² The role of government-directed economic shaping therefore remains an under-explored means for effecting general deterrence by denial.

A significant change in Australia’s economic security landscape occurred in April 2024 when the Prime Minister announced the *Future Made in Australia* industry policy. While the Prime Minister’s website says it is “about seizing the opportunities of the move to renewable energy while becoming a country that makes things again,”³³ the policy has a clear economic security intent.³⁴ To enact the support it considers necessary to address structural and strategic challenges to the Australian economy, the government has developed a National Interest Framework (NIF) that classifies priority industries under two streams: the Net Zero Transformation Stream; and the Economic Resilience and Security Stream.³⁵ Here, the potential for linking Australian industry policy and the deterrence strategy of *National Defence* emerges. *Resilience* is both a key element of

²⁸ Tilman Altenburg, *Industrial Policy in Developing Countries: Overview and Lessons from Seven Country Cases*, Discussion Paper / Deutsches Institut Für Entwicklungspolitik 4/2011 (Bonn: Deutsches Institut für Entwicklungspolitik, 2011), 1; Bathgate, ‘New Industrial Policy’, sec. Emergence of a ‘new industrial policy’; Toby Phillips and Esther Koh, ‘Setting Direction | A Purposeful Approach to Modern Industry Policy’, 4 April 2024, 3, <https://cpd.org.au/work/setting-direction-a-purposeful-approach-to-modern-industry-policy/>.

²⁹ Bathgate, ‘New Industrial Policy’, sec. Emergence of a ‘new industrial policy’; Phillips and Koh, ‘Setting Direction | A Purposeful Approach to Modern Industry Policy’, 3; Dean et al., ‘Industrial Policy-Making after COVID-19’, 288.

³⁰ Juhász, Lane, and Rodrik, ‘The New Economics of Industrial Policy’, 4.

³¹ Asia-Pacific Development, Diplomacy & Defence Dialogue, ‘Take a Whole-of-Nation Approach to International Policy’, AsiaPacific4D, accessed 10 September 2024, <https://asiapacific4d.com/idea/whole-of-nation/>; Asia-Pacific Development, Diplomacy & Defence Dialogue, ‘What Does It Look like for Australia to Use All Tools of Statecraft in Practice’, AsiaPacific4D, accessed 10 September 2024, <https://asiapacific4d.com/idea/all-tools-of-statecraft/>; Asia-Pacific Development, Diplomacy & Defence Dialogue, ‘Navigate a New Era of Economic Statecraft in the Indo-Pacific’, AsiaPacific4D, accessed 10 September 2024, <https://asiapacific4d.com/idea/navigate-a-new-era-of-economic-statecraft/>.

³² Graeme Dunk, ‘There Is No Deterrence without a Manufacturing Base - Strategic Analysis Australia’, accessed 2 October 2024, <https://strategicanalysis.org/there-is-no-deterrence-without-a-manufacturing-base/>.

³³ Anthony Albanese, ‘Future Made in Australia’, accessed 10 September 2024, <https://anthonyalbanese.com.au/our-work/future-made-in-australia>.

³⁴ Anthony Albanese and Jim Chalmers, ‘Investing in a Future Made in Australia | Prime Minister of Australia’, 14 May 2024, <https://www.pm.gov.au/media/investing-future-made-australia>.

³⁵ Commonwealth of Australia, ‘Future Made in Australia’, accessed 10 September 2024, <https://treasury.gov.au/publication/p2024-526942>.

this industry policy and the DSR's stated "central component of deterrence."³⁶ For this implicit linking of industry policy and deterrence to be cogent, industry policy must enhance resilience, and resilience must create a deterrent effect.

Deterrence through Resilience and a Whole-of-Nation Approach

Resilience has become the defining means of deterrence for Australia. Linking the two 'contrasting cornerstones of security' of deterrence and resilience has largely emerged in 21st century security policies.³⁷

Australia's 2017 Foreign Policy White Paper spoke at length of Australia's success being contingent on strength and resilience, community cohesion, and a competitive economy, however it was with the 2023 DSR that the link between resilience and deterrence was made clear.³⁸

The review calls resilience a central component of deterrence, arguing that a demonstrated ability to endure disruption lessens Australia's susceptibility to coercion, and signals Australia's resolve to an adversary.³⁹ The 2024 NDS reinforces the centrality of resilience, highlighting how national, industry, and supply chain resilience and integrated statecraft are critical to *National Defence*.⁴⁰ In placing resilience at the heart of its deterrence posture, Australia has followed the lead of NATO countries like the US and UK.⁴¹ NATO argues that 'national and collective resilience' are an essential basis for 'credible deterrence'.⁴² The organisation goes on to say that an 'all hazards' and 'whole of society' approach to resilience is an integral part of its deterrence posture. NATO states that societal resilience is an important aspect of deterrence by denial, and argues that resilience can persuade an adversary not to attack by convincing it that an attack will not achieve its intended objectives.⁴³ Linking the two, the logic follows that if a country demonstrates an ability to endure disruption (resilience), an aggressor loses confidence in their chance of success and ultimately does not engage in aggression (deterrence).



³⁶ Department of Defence, 'National Defence', 38.

³⁷ Edith Wilkinson, 'Resilience and Deterrence: Exploring Correspondence Between the Concepts', in *Deterrence*, ed. Anastasia Filippidou, Advanced Sciences and Technologies for Security Applications (Cham: Springer International Publishing, 2020), 19, https://doi.org/10.1007/978-3-030-29367-3_2; Rubén Arcos, Irena Chiru, and Cristina Ivan, eds., *Routledge Handbook of Disinformation and National Security* (London New York: Routledge, 2024), 21.

³⁸ Australian Government, 'Foreign Policy White Paper', 11–13.

³⁹ Department of Defence, 'National Defence', 38.

⁴⁰ Department of Defence, '2024 National Defence Strategy', Website (Defence, 17 April 2024), 18, <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

⁴¹ Prior, 'Resilience: The "Fifth Wave" in the Evolution of Deterrence'.

⁴² NATO, 'Resilience, Civil Preparedness and Article 3', NATO, accessed 18 September 2024, https://www.nato.int/cps/en/natohq/topics_132722.htm.

⁴³ NATO, 'Deterrence and Defence', NATO, accessed 18 September 2024, https://www.nato.int/cps/en/natohq/topics_133127.htm.

This seems a sound theoretical basis for a defence strategy, but Australia's embrace of a 'whole-of-nation' approach to deterrence through resilience is likely to be a considerable undertaking. Such an approach therefore demands some assurance that resilience does in fact have a deterrent effect.

The deterrent effect of resilience is validated by the relative success of the strategy among NATO's Baltic Sea states. During the Cold War, Sweden's proximity to NATO and the USSR, and their desire to maintain neutrality, motivated a whole-of-society approach to resilience. By requiring a whole-of-society contribution to 'Total Defense,' Sweden augmented their military with a resilient population and demonstrated a model approach to deterring threats.⁴⁴ For many years since, Sweden's resilience has contributed to the view that it is an unlikely candidate for Russian aggression, relative to other states in the region.⁴⁵ In light of changing circumstances, Sweden has revived its whole-of-society, collective resilience concept, and influenced several of its Baltic and Nordic neighbours in the process.⁴⁶ 'Total' or 'Comprehensive Defense' is a feature of the 2015 Swedish National Defence Bill, and the equivalent strategies and concepts of Estonia, Latvia, Lithuania, and Finland.⁴⁷ The concept refers to the integrated use of military and non-military efforts in a whole-of-nation approach to deter aggression. Total Defense is underpinned by resilience, and in the Baltic, societal resilience is having a successful deterrent effect. A study of approaches within the region makes the case that enhancing Baltic resilience is likely to continue to impact Moscow's risk calculus when considering a military occupation.⁴⁸ Resilience-enhancing efforts are not only necessary for deterring occupation or other military aggression, but to make the Baltic states more robust in the face of grey zone conflict.⁴⁹ This ability of resilience to support deterrence of a multitude of threats is a strong case for a whole-of-nation approach to enhancing resilience, and one that is having influence beyond NATO in places like Taiwan.

To help understand resilience's deterrent effect and identify any limitations, Australia would do well to monitor Taiwan's adoption of a NATO-like approach. There are parallels between Taiwan's context and that of the Baltic states; both border a major power that questions the legitimacy of their statehood. There are also parallels between Australia's context and Taiwan's; both have been the target of Beijing's coercive tactics. While the object of the DSR's deterrence posture is implicit, both Australia and Taiwan are seeking to deter aggression of some form, from the same source. Taiwan's 'porcupine strategy' builds on Sweden's Cold War 'Total Defense,' and constitutes a whole-of-society approach to deterrence.⁵⁰ In line with this strategy, Taiwan has established organisations to enhance national resilience to natural disasters and Chinese military threats, and the

⁴⁴ Jason Gambill and Christopher S Pinkerton, 'Resilience and Resistance, A NATO Model For Taiwan', 2021, 29, <https://doi.org/10.13140/RG.2.2.20580.86403>.

⁴⁵ James Rogers, 'Reinforcing Deterrence Through Societal Resilience: Countering Hybrid Threats in the Baltic Region', in *A Civil-Military Response to Hybrid Threats*, ed. Eugenio Cusumano and Marian Corbe (Cham: Springer International Publishing, 2018), 268–69, https://doi.org/10.1007/978-3-319-60798-6_12.

⁴⁶ Carl-Oskar Bohlin, Peter Rough, and Daniel Kochis, 'How Civil Defense Boosts Deterrence: A View from Sweden | Hudson Institute', 10 September 2024, <https://www.hudson.org/events/how-civil-defense-boosts-deterrence-view-sweden>.

⁴⁷ Stephen Flanagan et al., *Deterring Russian Aggression in the Baltic States Through Resilience and Resistance* (RAND Corporation, 2019), 2, <https://doi.org/10.7249/RR2779>.

⁴⁸ Flanagan et al., 26.

⁴⁹ Flanagan et al., 4.

⁵⁰ Elisabeth Braw, 'Taiwan and the Art of Societal Resilience', George W. Bush Presidential Center, 2023, sec. Get prickly, <https://www.bushcenter.org/catalyst/broken-china/taiwan-and-the-art-of-societal-resilience/>.

government has worked closely with the private sector to help mitigate trade risks to industries dependent on China.⁵¹ It is this latter step that is of particular interest for three reasons. First, it relates to the threat of Chinese economic coercion experienced by Taiwan and Australia alike. Second, like Taiwan, Australia must pursue a denial strategy to deter this threat as it has limited options for punishment.⁵² Third, deterring this threat requires a government to wield economic policy as a tool of statecraft; market forces alone cannot solve the problem if those forces are the very thing being manipulated to gain leverage. Taiwanese trade policy intervention seeks to enhance the country's economic resilience. By finding alternate export partners, Taiwan can better endure attempts at economic coercion. To enhance economic resilience, the national interest, and those of the private sector must align in an approach that extends beyond 'whole-of-government.' This is a candidate case study in whole-of-nation deterrence for Australia. By being a step ahead of Australia, Taiwan offers a contemporary, region-specific observation of NATO's societal resilience strategy in action.

Why Industry Policy Makes Sense for Australia

Given the context of the Australia-China economic relationship, it is also necessary to consider whether a trade policy approach to resilience like Taiwan's is sufficient for Australia's denial strategy. Australia's economy is vulnerable to trade tensions with China due to a relative lack of export profile diversity and given China's status as its largest trading partner.⁵³ Australia's dependence on China as an export market heightens its risk of economic coercion by Beijing, and many have argued for trade portfolio diversification as a mitigation.⁵⁴ Conceivably, Beijing's attempt to influence Australia's behaviour by pursuing an alternate source of coal or iron ore, or through an import ban or tariff, could be denied if Australia could export said coal or iron ore to another market. Responding to economic coercion by diversifying exports is therefore an intuitive approach and one that could work for industries that enjoy alternate markets.⁵⁵ Despite the decline in the Australia-China relationship, China remains Australia's largest trading partner and assessments of Australia's geoeconomic environment offer no time horizon beyond which attempts at coercion are expected to cease.⁵⁶ To the contrary, *National*

⁵¹ Braw, 'Taiwan and the Art of Societal Resilience'; Calvin Chu, 'Enhancing Taiwan's National Resilience - Taipei Times', 26 July 2024, <https://www.taipeitimes.com/News/editorials/archives/2024/07/26/2003821318>.

⁵² Ashley Townshend, David Santoro, and Toby Warden, 'Collective Deterrence and the Prospect of Major Conflict', 12 September 2023, <https://www.ussc.edu.au/collective-deterrence-and-the-prospect-of-major-conflict>.

⁵³ Ian Zhou and Tessa Satherley, 'Global Trade Risks and Opportunities', text, Australia, accessed 1 August 2024, https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/BriefingBook47p/GlobalTradeRisksAndOpportunities.

⁵⁴ Zhou and Satherley, sec. Trade tensions with China; Jeffrey Wilson, 'Adapting Australia to an Era of Geoeconomic Competition – Perth USAsia Centre', 10, accessed 21 July 2024, <https://perthusasia.edu.au/research-insights/publications/adapting-australia-to-an-era-of-geoeconomic-competition/>.

⁵⁵ Mike Adams, Ron Wickes, and Nicolas Brown, 'Australia's Response to Chinese Economic Coercion: Towards a Comprehensive Strategic Approach to Export Diversification', Policy Brief (Institute for International Trade, The University of Adelaide), 2, accessed 19 July 2024, <https://iit.adelaide.edu.au/news/list/2022/07/06/australias-response-to-chinese-economic-coercion-towards-a-comprehensive>.

⁵⁶ Ron Wickes, Mike Adams, and Nicolas Brown, 'Institute for International Trade', July 2021, 3, https://cisp.cachefly.net/assets/articles/attachments/86052_wp04-economic-coercion-by-china-the-effects-on-australias-merchandise-exports.pdf.

Defence is motivated by a strategic environment becoming increasingly contested. For the foreseeable future then, Australia should take steps to deter economic coercion. At a macro-level, attempts to harm Australia through economic coercion have been largely unsuccessful due to diversification and increased Chinese demand for iron ore. However, Beijing's inability to influence Australia's behaviour in its favour thus far is insufficient to assure the success of Australian export diversification as a deterrent. There is no guarantee trade solutions would succeed again in the face of any future attempts at coercion which could become more severe and have a greater impact.⁵⁷ Successful diversification requires alternate export partners, and these are finite; Australia cannot feasibly trade with everyone, and in the case of some primary commodities, there simply are no suitable alternate markets.⁵⁸ However, the most compelling objection to a reliance on trade portfolio diversification as a deterrent has to be its failure to treat the underlying issue of asymmetric economic dependence. This issue creates the conditions where economic coercion can be considered a viable means to influence or gain leverage. To enhance economic resilience, Australia must do more than diversify existing exports. Australia must instead begin restructuring economic activity to change the nature of the Australia-China relationship. This calls for the use of industry policy for deterrence beyond the bolstering of military capability.

Australia needs to employ industry policy to enhance its economic resilience and deter threats by denial. To successfully deter, Australia must seek to alter Beijing's thinking on the likely success of its attempts at coercion by reducing the perceived benefits of engaging in such behaviour.⁵⁹ Australia's use of economic tools should be in support of general deterrence – reducing the need to use immediate tools by creating a deterrence effect so well established that Beijing habitually hesitates to engage in coercive behaviour.⁶⁰ Australia must therefore take a longer-term view toward a restructure of economic activity, productivity-raising measures, and a better linking of economic and national security objectives.⁶¹ Industry policy is uniquely and ideally placed to service this need. There are several instances of industry policy being employed for resilience and security. In the case of resilience, the industry policy discussion often focuses on 'climate resilience' or 'supply chain resilience.' The latter gives rise to one of the most famous examples of modern industry policy being employed by a major power – the US' adoption of the Creating Helpful Incentives to Produce Semiconductors and Science Act (CHIPS and Science Act).⁶²

Through this industry policy, the US aims to establish itself as a leader in emerging technologies and semiconductor development, and to enhance the resilience of its

⁵⁷ James Laurenceson, Thomas Pantle, and Michael Zhou, 'PRC Economic Coercion: The Recent Australian Experience', 14 September 2020, 6.

⁵⁸ Adams, Wickes, and Brown, 'Australia's Response to Chinese Economic Coercion: Towards a Comprehensive Strategic Approach to Export Diversification', 3.

⁵⁹ Fergus Hunter et al., 'Countering China's Coercive Diplomacy', sec. What's the solution?, accessed 21 July 2024, <http://www.aspi.org.au/report/countering-chinas-coercive-diplomacy>.

⁶⁰ Mazarr, *Understanding Deterrence*, 4.

⁶¹ Adams, Wickes, and Brown, 'Australia's Response to Chinese Economic Coercion: Towards a Comprehensive Strategic Approach to Export Diversification', 1; Michael Wesley, 'Australia and the Rise of Geoeconomics', Working/Technical Paper, Centre of Gravity Series Papers (Strategic and Defence Studies Centre (SDSC), Australian National University, 2016), 18.

⁶² The White House, 'Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China', The White House, 9 August 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/>.

semiconductor supply chain by reducing its dependence on China.⁶³ The Act's factsheet makes the security motivations behind the policy clear: the US is reshaping economic activity to "create jobs, strengthen supply chains, and counter China."⁶⁴ By reducing dependence, the US is moving toward a greater level of strategic autonomy and perhaps indispensability, both of which have enabled Japan and Taiwan to deter coercion in the past.⁶⁵ While a prescription for an Australian approach to deterrence through industry policy would require its own detailed study, the *Future Made in Australia* policy gives an (admittedly less direct) indication of how Australia is beginning to pursue greater autonomy in its own way. Although the Net Zero Transformation Stream might not seem like a deterrent on the surface, what it does is begin the process of decoupling Australia's economic prosperity away from a China-heavy minerals and energy trade portfolio. Over time, this shift will likely reduce coercion options; as fossil fuels are traded less, the benefit to be gained from threatening to source coal from an alternate supplier decreases. Australia is taking its first steps along a path to denying an avenue for coercion, through long-term, general deterrence by denial.

Industry policy makes sense for Australia despite being relatively controversial among economic tools of statecraft. Despite renewed interest in industry policy and its potential deterrence effect, and the release of *Future Made in Australia*, its use is not a foregone conclusion; there remains a healthy level of scepticism after its decades "relegated to the political wilderness."⁶⁶ Historical aversion to industry policy is in part due to the central argument of government intervention in markets. For some, the idea that market failures are the fault of governments getting in the way of perfectly good market forces is ideological.⁶⁷ For many others, the concerns about government intervention are more rational; there are numerous examples of industry policy gone wrong. Altenburg's 2011 survey of industrial policy in developing countries summarises the clear failures of centrally planned economy experiments, the unsustainable debts resulting from import-substitution industrialisation strategies of the 1960s-70s, and a multitude of subsidised projects that failed.⁶⁸ Fortunately, the existence of these examples can help shape more sound policy approaches; Altenburg's survey, among others, offer a lot of general considerations for modern industry policy. As a result, modern industry policy can be developed to avoid succumbing to protectionism and a loss of focus on macro-objectives. Key to this, is having a clear national project (in this case, economic resilience) to steer and constrain government so that the industry policy means support the national strategic ends. There are also three apparent challenges specific to Australia's use of industry policy for resilience that should be managed.

⁶³ Santiago, Haraguchi, and Lavopa, 'Global Trends and World Order', 8.

⁶⁴ The White House, 'Fact Sheet'.

⁶⁵ Kotaro Shiojiri, 'Fight Against Economic Coercion: Opportunities and Challenges for Japan', *Stimson Center* (blog), 9 April 2024, sec. Japan's Response to Economic Coercion: Opportunities and Challenges, <https://www.stimson.org/2024/fight-against-economic-coercion-for-japan/>; Gambill and Pinkerton, 'Resilience and Resistance, A NATO Model For Taiwan', 42.

⁶⁶ Dean and Jackson, 'Industry Policy', 148.

⁶⁷ Dean and Jackson, 148.

⁶⁸ Altenburg, *Industrial Policy in Developing Countries*, 1.

First, the long-term, general deterrent approach requires careful, integrated planning to avoid a risk of premature decoupling. A parliamentary briefing book conveys that “analysts warn a significant reduction in trade with China could result in a reduction in living standards for Australians.”⁶⁹ The rate of change must be managed so that industry policies do not make Australians worse off.



Second, the government should avoid employing economic tools in a manner that does not accord with the ‘rules-based order.’ Doing so could undermine Australia’s reputation and the credibility of its deterrence posture. Finally, government intervention must not unacceptably impact Australia’s competitiveness in trade. Fundamentally, industry policy should build on current and intended future comparative advantages. Fortunately, *Future Made in Australia* seems to recognise this need. To be a ‘whole-of-nation’ approach to resilience, and therefore successfully deter, industry policy needs private sector buy-in, and the support of the population. This support is contingent on these risks being appropriately managed.

Where to From Here?

The release of *Future Made in Australia* signals the start of an approach that could see Australia employ industry policy as an element of national power in statecraft, to support deterrence. The role industry policy can play in deterring through resilience is understood, as are the associated policy-specific risks. *Future Made in Australia* may need to adapt to strategic circumstances, and the need for alternate industry policies may also arise in future. From here, it is necessary to consider how best to employ these policies in a ‘whole-of-nation’ approach to resilience and how to best ensure this resilience will have the desired effect. The former calls for coherence of strategy and coordinated management. The latter calls for clarity of communication.

Employing industry policy in support of national security objectives is likely to be a considerable undertaking. Adding a national security objectives ‘layer’ will exacerbate the challenge of managing policy which has already been criticised for a lack of cohesion and central coordination.⁷⁰ *Future Made in Australia* has also received early criticism for a supposed lack of clarity in its guidelines, and questions have emerged about how it will be managed.⁷¹ In considering what a whole-of-nation approach to international policy could look like, an AP4D options paper argues that “a new depth of coordination and coherence must be injected into Australia’s international and security policy.”⁷² In the

⁶⁹ Zhou and Satherley, ‘Global Trade Risks and Opportunities’, sec. Trade tensions with China.

⁷⁰ Robson, ‘Optimal Industry Policy - Speech’; Phillips and Koh, ‘Setting Direction | A Purposeful Approach to Modern Industry Policy’, 8.

⁷¹ Jacob Greber, ‘Government’s Future Made in Australia Plan Criticised for “vague and Difficult to Interpret” Guidelines’, *ABC News*, 29 July 2024, <https://www.abc.net.au/news/2024-07-29/future-made-in-australia-questioned-by-stakeholders/104155044>.

⁷² Asia-Pacific Development, Diplomacy & Defence Dialogue, ‘Take a Whole-of-Nation Approach to International Policy’, 11.

Swedish and Taiwanese examples, whole-of-nation resilience enhancing efforts were centrally managed. Coordination requires national strategic direction to be implemented through the relevant industry policy objectives, inter-departmental and inter-agency solution-development, and longer-term monitoring and evaluation.⁷³ Coherence requires that the approach supports the strategic ends. Both coherence and coordination may be best achieved with the support of a specialist organisation, established specifically to bridge the various government departments, and the government and private sector.⁷⁴

Regardless of how the strategy is managed, or by whom, communication must be front of mind when employing industry policy for deterrence. In 'Understanding Deterrence,' Mazarr cautions against focusing on the perspective of the country engaged in deterrence and argues that a successful strategy must focus on the perceptions of the aggressor.⁷⁵ Much of this paper has focused on the 'capability' part of the deterrence equation. It has shown that industry policy can support resilience, and that resilience can deter. But deterrence focused on capability without due consideration of communication risks failure; deterrence occurs in the mind of the aggressor. Sweden's successful deterrence of the USSR was enabled by its clear communication; Sweden outwardly communicated its deterrent posture, and actively sought to convince the Soviet Union that invading would be unlikely to succeed.⁷⁶ If Australia is serious about deterrence, it must communicate its intent. Dr Carr's criticism of the 2023 DSR still holds; if Australia is deterring Beijing it should say so. If Australia is going to use industry policy for resilience, and is building resilience to deter Beijing, it should say so. While the White House Factsheet on the CHIPS and Science Act is abundantly clear that countering China is among its objectives, *Future Made in Australia* is held up as being about the green transition and "making more things here." The Lowy Institute Poll 2024 says the policy "seeks to...achieve economic, national security, and decarbonisation objectives,"⁷⁷ without expounding those national security objectives. The link between Australia's embrace of industry policy and its strategy of deterrence is implicit at best. Australia needs to be clear what deterring with all elements of national power in statecraft means, lest it risk failure.

Conclusion

Explicit calls for Australia to pursue economic structural reform to support its denial strategy are limited. Comprehensive and integrated approaches to deterrence recognise the role of economic tools, although the focus is generally on promoting open and transparent trade, portfolio diversification, and the threat of sanctions. Australia's middle power status and the intersection of its strategic environment, its chosen strategy of deterrence by denial, and its long-term precarious economic position demands more. The re-emergence of industry policy as a means of enhancing economic resilience presents an opportunity for Australia to develop the capability to deter threats from Beijing.

In a piecemeal fashion, Australia has begun to communicate its willingness to capitalise

⁷³ Ken Warwick, 'Beyond Industrial Policy: Emerging Issues and New Trends', OECD Science, Technology and Industry Policy Papers, vol. 2, OECD Science, Technology and Industry Policy Papers, 5 April 2013, 4, <https://doi.org/10.1787/5k4869clw0xp-en>.

⁷⁴ Godofredo Ramizo Jr., 'Industrial Policy: A Survey of Institutional Challenges', *Journal of Australian Political Economy* 2016, no. 77 (1 December 2016): 138.

⁷⁵ Mazarr, *Understanding Deterrence*, 1.

⁷⁶ Gambill and Pinkerton, 'Resilience and Resistance, A NATO Model For Taiwan', 30; Braw, 'Taiwan and the Art of Societal Resilience', sec. Get prickly.

⁷⁷ Neelam, '2024 Report', sec. Free trade.

on this opportunity. With *National Defence*, Australia has embraced deterrence by denial as a strategy, and linked deterrence to resilience. *National Defence* calls for all elements of national power in statecraft but leaves the extent to which it will employ economic reforms and the object of its deterrence strategy unstated. The nascent *Future Made in Australia* industry policy seeks to build resilience, but the National Interest Framework does not mention deterrence and stops short of linking the policy to Defence artefacts. The elements are all there; what is needed now is a coherent, whole-of-nation approach, clearly communicated.

This paper has made the case for Australian industry policy to support deterrence. It has argued that industry policy can deter, and that Australia should employ it accordingly. Whether or not industry policy will have the deterrent effect Australia seeks will depend on how successfully it can be employed, and how it is perceived. Industry policy implementation would depart from the free-market approach and preference industries based on national security objectives. For Australia to successfully employ the tool, the interests of government and the private sector must be bridged; the opportunity cost must be understood, and the rationale must be compelling. Coherent and coordinated strategic industry policy management will be critical for this whole-of-nation approach. That leaves the last variable in the equation – communication. Beijing’s perception will determine the success of Australia’s deterrence. Australia must consistently communicate that coercive acts are so unlikely to succeed in their aims that the costs cannot be justified. Influencing Beijing’s risk calculation requires clear communication of Australia’s industry policy intent.

References

Adams, Mike, Ron Wickes, and Nicolas Brown. 'Australia's Response to Chinese Economic Coercion: Towards a Comprehensive Strategic Approach to Export Diversification'. Policy Brief. Institute for International Trade, The University of Adelaide. Accessed 19 July 2024. <https://iit.adelaide.edu.au/news/list/2022/07/06/australias-response-to-chinese-economic-coercion-towards-a-comprehensive>.

Albanese, Anthony. 'Future Made in Australia'. Accessed 10 September 2024. <https://anthonyalbanese.com.au/our-work/future-made-in-australia>.

Albanese, Anthony, and Jim Chalmers. 'Investing in a Future Made in Australia | Prime Minister of Australia', 14 May 2024. <https://www.pm.gov.au/media/investing-future-made-australia>.

Altenburg, Tilman. *Industrial Policy in Developing Countries: Overview and Lessons from Seven Country Cases*. Discussion Paper / Deutsches Institut Für Entwicklungspolitik 4/2011. Bonn: Deutsches Institut für Entwicklungspolitik, 2011.

Anderson, Matthew P. 'NATO Nuclear Deterrence: The Warsaw Summit and Beyond'. *Connections: The Quarterly Journal* 15, no. 4 (2016): 5–30. <https://doi.org/10.11610/Connections.15.4.01>.

Arcos, Rubén, Irena Chiru, and Cristina Ivan, eds. *Routledge Handbook of Disinformation and National Security*. London New York: Routledge, 2024.

Asia-Pacific Development, Diplomacy & Defence Dialogue. 'Navigate a New Era of Economic Statecraft in the Indo-Pacific'. AsiaPacific4D. Accessed 10 September 2024. <https://asiapacific4d.com/idea/navigate-a-new-era-of-economic-statecraft/>.

———. 'Take a Whole-of-Nation Approach to International Policy'. AsiaPacific4D. Accessed 10 September 2024. <https://asiapacific4d.com/idea/whole-of-nation/>.

———. 'What Does It Look like for Australia to Use All Tools of Statecraft in Practice'. AsiaPacific4D. Accessed 10 September 2024. <https://asiapacific4d.com/idea/all-tools-of-statecraft/>.

Australian Government. 'Foreign Policy White Paper'. Text. Foreign Policy White Paper. Foreign Policy White Paper, 2017. <https://www.dfat.gov.au/sites/default/files/2017-foreign-policy-white-paper.pdf>.

Bathgate, Becky. 'New Industrial Policy: A Future Made in Australia'. Text. Australia. Accessed 10 September 2024. https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/Budget/reviews/2024-25/NewIndustryPolicy.

Bohlin, Carl-Oskar, Peter Rough, and Daniel Kochis. 'How Civil Defense Boosts Deterrence: A View from Sweden | Hudson Institute', 10 September 2024. <https://www.hudson.org/events/how-civil-defense-boosts-deterrence-view-sweden>.

Braw, Elisabeth. 'Taiwan and the Art of Societal Resilience'. George W. Bush Presidential Center, 2023. <https://www.bushcenter.org/catalyst/broken-china/taiwan-and-the-art-of-societal-resilience/>.

Carr, Andrew. 'Australia's Archipelagic Deterrence'. *Survival* 65, no. 4 (4 July 2023): 79–100. <https://doi.org/10.1080/00396338.2023.2239058>.

———. 'Australia's New Defence Era: Archipelagic Deterrence'. *The Strategist*, 28 August 2023. <https://www.aspistrategist.org.au/australias-new-defence-era-archipelagic-deterrence/>.

Chu, Calvin. 'Enhancing Taiwan's National Resilience - Taipei Times', 26 July 2024. <https://www.taipeitimes.com/News/editorials/archives/2024/07/26/2003821318>.

Commonwealth of Australia. 'Future Made in Australia'. Accessed 10 September 2024. <https://treasury.gov.au/publication/p2024-526942>.

Dean, Mark, and Shirley Jackson. 'Industry Policy'. *Journal of Australian Political Economy*, no. 92 (2024): 148–65.

Dean, Mark, Al Rainnie, Jim Stanford, and Dan Nahum. 'Industrial Policy-Making after COVID-19: Manufacturing, Innovation and Sustainability'. *The Economic and Labour Relations Review* 32, no. 2 (June 2021): 283–303. <https://doi.org/10.1177/10353046211014755>.

Department of Defence. '2024 National Defence Strategy'. Website. Defence, 17 April 2024. <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

———. 'National Defence: Defence Strategic Review 2023'. Website. Accessed 18 February 2024. <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>.

Dunk, Graeme. 'There Is No Deterrence without a Manufacturing Base - Strategic Analysis Australia'. Accessed 2 October 2024. <https://strategicanalysis.org/there-is-no-deterrence-without-a-manufacturing-base/>.

Flanagan, Stephen, Jan Osburg, Anika Binnendijk, Marta Kepe, and Andrew Radin. *Detering Russian Aggression in the Baltic States Through Resilience and Resistance*. RAND Corporation, 2019. <https://doi.org/10.7249/RR2779>.

Gambill, Jason, and Christopher S Pinkerton. 'Resilience and Resistance, A NATO Model For Taiwan', 2021. <https://doi.org/10.13140/RG.2.2.20580.86403>.

Greber, Jacob. 'Government's Future Made in Australia Plan Criticised for "vague and Difficult to Interpret" Guidelines'. *ABC News*, 29 July 2024. <https://www.abc.net.au/news/2024-07-29/future-made-in-australia-questioned-by-stakeholders/104155044>.

Hunter, Fergus, Daria Impiombato, Yvonne Lau, Adam Triggs, Albert Zhang, and Urmika Deb. 'Countering China's Coercive Diplomacy'. Accessed 21 July 2024. <http://www.aspi.org.au/report/countering-chinas-coercive-diplomacy>.

Joint Statement. 'Joint Declaration Against Trade-Related Economic Coercion and Non-Market Policies and Practices', 9 June 2023. <https://www.foreignminister.gov.au/minister/penny-wong/media-release/joint-declaration-against-trade-related-economic-coercion-and-non-market-policies-and-practices>.

Juhász, Réka, Nathan Lane, and Dani Rodrik. 'The New Economics of Industrial Policy'. *Annual Review of Economics*, August 2023. <https://doi.org/10.1146/annurev-economics-081023-024638>.

Kim, Dong Jung. 'Economic Deterrence Through Economic Engagement'. *Foreign Policy Analysis* 15, no. 2 (1 April 2019): 176–86. <https://doi.org/10.1093/fpa/ory001>.

Laurenceson, James, Thomas Pantle, and Michael Zhou. 'PRC Economic Coercion: The Recent Australian Experience', 14 September 2020.

Mazarr, Michael J. *Understanding Deterrence*. Santa Monica, CA: RAND Corporation, 2018. <https://doi.org/10.7249/PE295>.

Mazarr, Michael J., Arthur Chan, Alyssa Demus, Bryan Frederick, Alireza Nader, Stephanie Pezard, Julia A. Thompson, and Elina Treyger. *What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression*. Santa Monica, CA: RAND Corporation, 2018. <https://doi.org/10.7249/RR2451>.

Muresianu, Alex. 'Tax Cuts and Jobs Act, Inflation Reduction Act, CHIPS Act: Comparing and Contrasting the New Industrial Policy'. *States News Service*, 8 March 2024. Gale Academic OneFile.

NATO. 'Deterrence and Defence'. NATO. Accessed 18 September 2024. https://www.nato.int/cps/en/natohq/topics_133127.htm.

———. 'Resilience, Civil Preparedness and Article 3'. NATO. Accessed 18 September 2024. https://www.nato.int/cps/en/natohq/topics_132722.htm.

Neelam, Ryan. '2024 Report: Economy and Trade - Lowy Institute Poll'. Lowy Institute Poll 2024. Accessed 29 July 2024. <https://poll.lowyinstitute.org/report/2024/economy-and-trade/#report>.

OECD. 'Industrial Policy'. OECD. Accessed 27 September 2024. <https://www.oecd.org/en/topics/policy-issues/industrial-policy.html>.

Peters, Robert, Justin Anderson, and Harrison Menke. 'Deterrence in the 21st Century: Integrating Nuclear and Conventional Force', 2018.

Phillips, Toby, and Esther Koh. 'Setting Direction | A Purposeful Approach to Modern Industry Policy', 4 April 2024. <https://cpd.org.au/work/setting-direction-a-purposeful-approach-to-modern-industry-policy/>.

Prior, Tim. 'Resilience: The "Fifth Wave" in the Evolution of Deterrence', 12 April 2019. <https://css.ethz.ch/en/services/digital-library/articles/article.html>.

Ramizo Jr., Godofredo. 'Industrial Policy: A Survey of Institutional Challenges'. *Journal of Australian Political Economy* 2016, no. 77 (1 December 2016): 136–51.

Robson, Alex. 'Optimal Industry Policy - Speech', 30 August 2023. <https://www.pc.gov.au/media-speeches/speeches/optimal-industry-policy>.

Rogers, James. 'Reinforcing Deterrence Through Societal Resilience: Countering Hybrid Threats in the Baltic Region'. In *A Civil-Military Response to Hybrid Threats*, edited by Eugenio Cusumano and Marian Corbe, 259–80. Cham: Springer International Publishing, 2018. https://doi.org/10.1007/978-3-319-60798-6_12.

Santiago, Fernando, Nobuya Haraguchi, and Alejandro Lavopa. 'Global Trends and World Order: Implications for New Industrial Policies in Developing Countries'. *Journal of Industry, Competition and Trade* 24, no. 1 (December 2024): 5. <https://doi.org/10.1007/s10842-024-00419-4>.

Shiojiri, Kotaro. 'Fight Against Economic Coercion: Opportunities and Challenges for Japan'. *Stimson Center* (blog), 9 April 2024. <https://www.stimson.org/2024/fight-against-economic-coercion-for-japan/>.

The White House. 'Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China'. The White House, 9 August 2022. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/>.

Townshend, Ashley, David Santoro, and Toby Warden. 'Collective Deterrence and the Prospect of Major Conflict', 12 September 2023. <https://www.ussc.edu.au/collective-deterrence-and-the-prospect-of-major-conflict>.

Warwick, Ken. 'Beyond Industrial Policy: Emerging Issues and New Trends'. OECD Science, Technology and Industry Policy Papers. Vol. 2. OECD Science, Technology and Industry Policy Papers, 5 April 2013. <https://doi.org/10.1787/5k4869clw0xp-en>.

Wesley, Michael. 'Australia and the Rise of Geoeconomics'. Working/Technical Paper. Centre of Gravity Series Papers. Strategic and Defence Studies Centre (SDSC), Australian National University, 2016.

Wickes, Ron, Mike Adams, and Nicolas Brown. 'Institute for International Trade', July 2021. https://cisp.cachefly.net/assets/articles/attachments/86052_wp04-economic-coercion-by-china-the-effects-on-australias-merchandise-exports.pdf.

Wilkinson, Edith. 'Resilience and Deterrence: Exploring Correspondence Between the Concepts'. In *Deterrence*, edited by Anastasia Filippidou, 19–33. Advanced Sciences and Technologies for Security Applications. Cham: Springer International Publishing, 2020. https://doi.org/10.1007/978-3-030-29367-3_2.

Wilson, Jeffrey. 'Adapting Australia to an Era of Geoeconomic Competition – Perth USAsia Centre'. Accessed 21 July 2024. <https://perthusasia.edu.au/research-insights/publications/adapting-australia-to-an-era-of-geoeconomic-competition/>.

Wirtz, James, and Jeffrey Larsen. 'Who Does Deterrence?' *The RUSI Journal* 168, no. 6 (19 September 2023): 14–20. <https://doi.org/10.1080/03071847.2023.2288133>.

Zhou, Ian, and Tessa Satherley. 'Global Trade Risks and Opportunities'. Text. Australia. Accessed 1 August 2024. https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/BriefingBook47p/GlobalTradeRisksAndOpportunities.



How the ADF can support Australia's response to grey-zone and traditional security challenges in Antarctica

Major Cameron Clarke

Major Cameron Clarke is an Infantry Officer and graduate of the Australian Command and Staff Course (Military Art) class of 2024. He is currently posted to the Land Combat College in Canberra where he is responsible for the analysis, design and development of the Army Foundation Officer Training Continuum.

A "Catch-22" is "a problem for which the only solution is denied by a circumstance inherent in the problem or by a rule".¹

Introduction

Antarctica sits out of sight and out of mind for the vast majority of the Australian population. Some people may think of Antarctica as a harsh and desolate frozen desert, others may consider it a pristine environmental wonderland. Most probably think of it for the penguins. However, in recent years Antarctica has become a figurative and literal hot topic for the media and many strategic thinkers. The most obvious and immediate issue is climate change which is wreaking havoc on the southern continent, with Antarctic sea ice recordings in 2024 being near all-time lows, causing significant security concerns for Australia and the rest of the global community.² However, not as obvious but as challenging for Australia is the increasingly opaque actions of some revisionist powers on Antarctica, such as China and Russia, at a time where great power competition is as high as it has been for decades.³ These challenges have thrust Antarctica back into public view and raised many questions about how Australia is responding to the security concerns to our south.

Australia has had a vested interest in Antarctica since its earliest explorers and prides itself on being an Antarctic leader. Around 42 percent of the continent is claimed by Australia as sovereign territory, a landmass of 5.9 million square kilometres which equates to almost 80 percent of the landmass of Australia.⁴ This vast claim, the Australian Antarctic Territory (AAT), underscores the significant stake that Australia has in maintaining a secure and stable Antarctica. Currently, Australia's approach to achieving this security is through upholding the six-decade old Antarctic Treaty System

¹ Merriam-Webster, s.v. "Catch-22," *Merriam-Webster.com Dictionary*, accessed October 13, 2024

² Ayesha Tandon, "Antarctic Sea Ice Maximum in 2024 Is Second Lowest on Record," Carbon Brief, October 4, 2024, Online

³ Ryan Burke and Jahara Matisek, "The Polar Trap: China, Russia, and American Power in the Arctic and Antarctica," *Journal of Indo-Pacific Affairs*, October 25, 2021: 36

⁴ Australian Antarctic Division, "Australian Antarctic Territory," Australian Antarctic Program, accessed October 4, 2024, Online

(ATS), by leading scientific research, maintaining environmental protections and increasing collaborative educational and economic opportunities.⁵ As technology develops, great power competition escalates and the strategic importance of Antarctica increases questions are being asked, including by the Vice Chief of the Australian Defence Force (ADF), on whether this approach is robust enough to maintain our interest in the AAT as more grey zone and traditional security challenges arise.⁶ However, as the ATS has restrictions on military actions in Antarctica and Australia prides itself as a leader in the rules-based global system a “Catch-22” arises, where to respond to other nations bending or breaking the ATS would require Australia to do the same, undermining ourselves and justifying the behaviour of revisionist states.

This paper will argue that to best protect Australian national interests in Antarctica and provide assurance of long-term security in the face of rising grey-zone and traditional challenges, the ADF must take action to support the Government’s broader Antarctic strategy. It will show that the ADF can do this in ways which do not directly contravene the non-militarisation articles of the ATS, and in concert with its broader “Strategy of Denial”.⁷ While many commentators acknowledge the growing security challenges in Antarctica, and some recommend stronger actions from broader government, this paper will go a step further and attempt to bridge theory and practice by providing tangible actions which the ADF could specifically take. Should the ADF continue to ignore or exclude Antarctica from Defence thinking, as it has done so for some time now, a critical lever of national power will be unprepared should the Government need to address any significant shift in the Antarctic security situation.

Method and Structure

In order to discern how Australia can best respond to more traditional security threats in Antarctica, including grey zone activity, this paper has use existing media articles, academic perspectives and official documents to gain a broad understanding of the historical aspects of security threats in Antarctica, the current means for enforcing security, emerging threats and existing solutions. Over seventy historical and contemporary sources and pieces were examined as part of this literature review, and while not all of them were pertinent to the final paper, they were all useful in gaining a comprehensive understanding of broader Antarctic history and policy. The reviewed sources that did inform the final conclusions are referenced throughout. It is acknowledged that the majority of the literature review was of Western (primarily Australian, British and United States) authors and media, with a heavy bent towards official government sources and defence focussed academics due to the nature of the research question. This paper also broadly ignores the primary security challenge for Antarctica, being the scourge of climate change, as numerous other authors have done so far more comprehensively, and the current Government strategy is already focussed on responding to that threat. Finally, only non-classified documents were available for review, thus there is potential that the ADF has or is already taking actions beyond those currently publicised; however, this is unlikely given the lack of evidence or effect.

To inform the argument that the ADF should take actions to best support the protection of Australian national interests in Antarctica, this paper will develop over three sections. The first section of this paper will provide deeper context to how the ATS developed to respond to traditional security challenges, what are Australian national interests in

⁵ Australian Antarctic Division, Australia’s Antarctic Strategy and 20 Year Action Plan: 2022 Update, 2022: 7

⁶ Australian War College, Research Questions asked by Senior Leaders 2024, AWC707 Additional Resources: 1

⁷ Department of Defence, *National Defence Strategy 2024*, Australian Government, 2024: 22

Antarctica and the current grey-zone and potential traditional security concerns surrounding revisionist actions in Antarctica. The second section will review the ADF's past policies and current actions in support of Australian interests in Antarctica, leading opinions on how Australia should approach traditional security concerns in the AAT and current actions by likeminded states. The final section will provide some potential options which the ADF could take to better support our national interests in Antarctica and the most significant risks posed by the "Catch-22" that both action and inaction by the ADF creates.

Section 1 – Antarctic Background and Security Concerns

The Antarctic Treaty System (ATS)

The Antarctic Treaty System (ATS) emerged during a critical period of Cold War tensions, serving as a remarkable example of international cooperation against the backdrop of global competition. As the two super powers of the time competed for influence across the globe and into the new space domain, the ATS was signed in 1959 and entered into force in 1961, to prevent Antarctica from becoming another theatre of rivalry.⁸ Up until this point in time, seven countries including Australia had made territorial claims to parts of Antarctica, some of which overlapped, creating potential for conflict over resources and strategic positions to the southern corridors of the world's oceans. As numerous research stations were established to gain position on the continent, there was a clear need for what would become "the first arms control agreement in... the Cold War".⁹

To meet this need, the ATS was written in a way that was both deliberate and ambiguous enough that it would appeal to all states, regardless of their existing or future desire to claim Antarctic sovereignty.¹⁰ Article IV of the treaty essentially froze the status quo on Antarctica, neither denying existing claims, nor recognising them or any future claims on the continent.¹¹ Article I banned any "non-peaceful" military actions on the continent including weapons tests and exercises, ensuring Antarctica could only be used for scientific purposes.¹² Articles II and VII ensured that all areas on Antarctica would be free and open for access by any party to access for research or to maintain transparency through inspections.¹³ These agreements, coupled with other Articles enshrining consistent dialogue, diplomacy and cooperation effectively put all questions of sovereignty on hold and removed the potential for any aggressive resolutions of ongoing or future territorial disputes. This has allowed evolution of the ATS to include new provisions which further protect the environment, such as the Madrid Protocol of 1991, which placed a prohibition on the extraction of mineral resources, and the Convention on the Conservation of Antarctic Marine Living Resources of 1982 which restricts and monitors actions in Antarctic fisheries.

Despite its longevity and the perceived successes over the past sixty years, the ATS in

⁸ Jeffrey McGee, "Geopolitical Scenarios Examining the Potential for Militarisation of Antarctica," *United Service* 74, no. 1 (March 2023): 15

⁹ Ryan Burke, *The Polar Pivot: Great Power Competition in the Arctic and Antarctic*, (Boulder, CO: Lynne Rienner Publishers, 2022): 33.

¹⁰ Robert E. Wilson, "National Interests and Claims in the Antarctic," *Arctic* 17, no. 1 (March 1964): 24

¹¹ Antarctic Treaty, 1 December 1959, 402 UNTS 71

¹² Antarctic Treaty Secretariat, "The Antarctic Treaty," *Antarctic Treaty System*, accessed October 6, 2024, Online

¹³ *Ibid*

the modern era is a fragile solution in the face of renewed great power competition and increasing resource pressures.¹⁴ It relies on the willingness and altruism of the signatory states to behave in line with not only the wording of the various articles and protocols, but also within the spirit of Antarctic cooperation, without the requisite mechanisms for enforcing compliance.¹⁵ With 57 states now party to the ATS, 29 of whom have consultative and therefore voting power,¹⁶ it places a significant pressure on a system which was designed for a small group whose original interests were mostly avoiding nuclear war between the Cold War powers. As latter sections of this paper will highlight the scenario that is evolving in Antarctica is one where individual nations are bending the standards of the ATS to meet their national interests and using their voting powers to stifle the systems success, which means relying solely on the ATS to remain enforced without taking active measures poses a strategic risk to Australian interests on the continent.

Australian Interests in Antarctica

Australia has significant interest in Antarctica due primarily to both proximity and territorial claims. In 1933, an act was passed by parliament, stating “*that part of the territory in the Antarctic seas which comprises all the islands and territories, other than Adelie Land, situated south of the 60th degree south latitude and lying between the 160th degree east longitude and the 45th degree east longitude, is hereby declared to be accepted by the Commonwealth as a Territory under the authority of the Commonwealth, by the name of the Australian Antarctic Territory.*”¹⁷ For the last ninety years, Australia has maintained this claim of sovereignty over the largest portion of the continent, with three permanent stations on the continent and one on Macquarie Island, allowing a year round presence in the AAT, two of which pre-date the establishment of the ATS.¹⁸ This presence on AAT, coupled with the relative peace and stability afforded by the ATS to date, has provided Australia a strategic buffer to the South, giving comfort that no threats could easily threaten our southern approaches or sea lines of communication.¹⁹ Successive governments have reiterated this strategic importance, and the core national interests have hardly changed since the Hawke administration first officially published them in the mid-1980s.²⁰

The latest interests are articulated in the Australian Antarctic Strategy and 20 Year Action Plan which was last updated in 2022, and are summarised as:

- Maintain Antarctica’s freedom from strategic and/or political confrontation;
- Preserve our sovereignty over the AAT, including our sovereign rights over adjacent offshore areas;

¹⁴ Elizabeth Buchanan, Ice Panda: Navigating China’s Hybrid Antarctic Agenda, Australian Strategic Policy Institute, August 2024: 6

¹⁵ Ryan Burke, The Polar Pivot: Great Power Competition in the Arctic and Antarctic, (Boulder, CO: Lynne Rienner Publishers, 2022): 225

¹⁶ Antarctic Treaty Secretariat, "Parties to the Antarctic Treaty," *Antarctic Treaty System*, accessed October 6, 2024, Online

¹⁷ Australian Government, Australian Antarctic Territory Acceptance Act 1933, Sect. 2

¹⁸ Tony Press, "Security Challenges of Antarctica and the Southern Ocean," United Service 74, no. 1 (March 2023): 22

¹⁹ Elizabeth Buchanan, Ice Panda: Navigating China’s Hybrid Antarctic Agenda, Australian Strategic Policy Institute, August 2024: 6

²⁰ Marcus Haward and Andrew Jackson, "Australia’s Antarctic Future," in *Australia and the Antarctic Treaty System: 50 Years of Influence*, ed. Marcus Haward and Tom Griffiths (Sydney: University of New South Wales Press, 2011): 338.

- Support a strong and effective ATS;
- Conduct world-class scientific research consistent with national priorities;
- Protect the Antarctic environment, having regard to its special qualities and effects on our region;
- Be informed about and able to influence developments in a region geographically proximate to Australia;
- Foster economic opportunities arising from Antarctica and the Southern Ocean, consistent with our ATS obligations including the ban on mining and oil drilling.²¹

However, while the intent may be good, the Department of Climate Change, Energy, the Environment and Water, who are responsible for executing the strategy through the Australian Antarctic Division (AAD), are hampered by budgetary concerns and workforce issues.²² And much like the ATS, the interests of Australia can only be achieved with the current level of support if all other states also do their part in not causing confrontation and supporting the ATS. Unfortunately, this is not the case.



Emerging grey-zone and traditional challenges

It is no secret that the greatest strategic concern to Australia at present is the challenge posed by China in the Indo-Pacific region and the potential for the status-quo of a United States rules-based order to be undermined by revisionist states. The opening paragraphs, written by the Deputy Prime Minister, of the 2024 National Defence Strategy name China and Russia specifically as threats to global order and Australia's interests.²³ While the remainder of the document fails to mention Antarctica, there is significant evidence which suggests that both countries have strategic interest in Antarctica and are stretching the ATS to its limits.

Russia

²¹ AAP, Australian Antarctic Strategy & 20 year Action Plan: Update 2022, Australian Government, 2022,

²² Department of Climate Change, Energy, the Environment and Water, Australian Antarctic Division Budget And Jobs, 2023, accessed October 9, <https://www.dcceew.gov.au/sites/default/files/documents/77327.pdf>

²³ Department of Defence, National Defence Strategy 2024, Australian Government, 2024: P6

Russia's involvement in the Antarctic was a driving force for the establishment of the ATS, with Soviet presence in the AAT expanding to seven research stations during the 1950s and threats of military basing causing significant concern to Australia and its interests.²⁴ Australia's foreign minister at the time went as far as stating "We do not want the Russians to mount installations in the Antarctic from which they can drop missiles on Melbourne or Sydney".²⁵ Russia's view is that they have a right to be perceived as a polar power and their media often victimises the Russia position on the continent, remarking that the ATS, claimant states and the United States seek to "capture the continent".²⁶ Yet Russia's actions both on Antarctica and in Europe seem to demonstrate that it is not the victim, and instead sees Antarctica as another theatre where it can challenge the global order. Russia's Antarctic action plan sets goals for the establishment of new infrastructure to provide a further foothold on the continent, its Maritime Doctrine calls for investments in equipment and machinery and the National Security Strategy singles out increasing a presence in Antarctica to provide unhampered access to the Southern Ocean.²⁷

Of note are Russia's actions with its GLONASS dual-purpose navigation systems, where much like the equivalent Global Positioning System employed by the United States and its partners, GLONASS installations in Antarctica are critical for intelligence, surveillance and reconnaissance for military uses. Where the Western powers are more transparent with their use of GPS, Russia does not share the same view and given that President Putin expressly mentioned that Russian superweapons could "attack through the North and South poles", it is likely that the Russians would not hesitate to use their Antarctic systems to support military theatres.²⁸ Beyond the dual use technologies are Russia's suspicious actions in recent years, including the blocking of Norwegian inspectors in 2018,²⁹ an act expressly forbidden by the ATS, and falsifying of monitoring systems to mask the location of fishing vessels in 2020.³⁰ Thanks to Russia's position on both the United Nations security council and the ATS bodies, the ability to block actions to curb this behaviour has led to the Russians further eroding the strength of the ATS. While the current actions in Ukraine have significantly drained the resources available to Russian actions in Antarctica, they have demonstrated that Russia is not bound by the norms of the global order, and may hope to increase competition in other strategic regions, like Antarctica, to support its aims closer to home.³¹

China

²⁴ Jeffrey McGee, David Edmiston, and Marcus Haward, *The Future of Antarctica: Scenarios from Classical Geopolitics*, (Singapore: Springer, 2022): 21-23

²⁵ Klaus Dodds, "Antarctic Geopolitics," in *Handbook on the Politics of Antarctica*, ed. Klaus Dodds, Alan D. Hemmings, and Peder Roberts (Cheltenham, UK: Edward Elgar Publishing, 2017), Chapter 13.

²⁶ Mathieu Boulègue, *Russia and China in Antarctica and the Southern Ocean: Implications for the Five Eyes*, Sea Power Centre, Royal Australian Navy, 2022: 5

²⁷ Mathieu Boulègue, *Russia and China in Antarctica and the Southern Ocean: Implications for the Five Eyes*, Sea Power Centre, Royal Australian Navy, 2022: 5-6

²⁸ *Ibid*: 7

²⁹ Norwegian Government, *Report of the Norwegian Antarctic Inspection Under Article VII of the Antarctic Treaty and Article 14 of the Environmental Protocol*, February 2018, accessed 9 October 2024, Online

³⁰ Commission for the Conservation of Antarctic Marine Living Resources, *Report of the Thirty-Ninth Meeting of the Commission*, Virtual Meeting, 27–30 October 2020, accessed 9 October 2024, Online

³¹ Charles H. Jacoby Jr. and Ryan Burke, "Russia, China, and the Facts of Polar Security," *Modern War Institute*, July 20, 2023, accessed 9 October 2024, Online

While Russia raises concerns for future Antarctic security, it is China who presents the greatest challenge to Australian national interests and the most realistic traditional threat to Antarctica. Much like their actions elsewhere in the region, in space and in cyberspace, China acts in assertive, aggressive and unexplained ways in Antarctica.³² China advocates in its Antarctic strategy for safeguarding the ATS and moving towards a more equitable orientation of governance supported by Chinese leadership.³³ However, much like its broader global policies, China actions demonstrate that it views Antarctica in a more realist fashion, where the freezing of sovereignty by the ATS allows rational use and a “first come, first serve mentality”.³⁴ Since establishing its first station in 1985, China has built five bases on the continent, the majority of which are located within the AAT.³⁵ Thanks to China’s ‘civil–military’ fusion laws, even though these stations are outwardly designed for scientific research, any strategic benefit can be shared with the military.³⁶ China is also investing heavily in icebreaking ships, with its first nuclear powered version launched in 2024, and strengthening its logistic network, which alludes to a long-term intent to secure strategic access and operational autonomy in Antarctica.³⁷ Should conflict ever break out elsewhere in the Indo-Pacific, these assets and China’s bases would fall under the command of the Peoples’ Liberation Army – Navy, creating a dilemma for Australia in particular.³⁸

Much like the Russians, China exploits the grey area of the ATS to its considerable advantage.³⁹ Whether it is installation of their own dual-use BeiDou navigation system, exploration for minerals or circumventing inspections and fishery limits, China uses the ambiguity of the ATS to its advantage. Even when it comes to the mandatory reporting of actions on Antarctica, China remains obscure choosing to either not publish or report nothing in its annual reports on operations, activities and military support.⁴⁰ While the ATS serves its purposes for China at present, it seems clear from their actions that should a situation arise where the benefit of breaking from the treaty arose, such as mining becoming financially viable or conflict in the South China Sea prompting military security of Chinese dual-use assets, they will exploit that opportunity.⁴¹ For Australia, this indicates that the current policies of relying on the ATS to curb the actions of states like Russia and China are only useful as long as adhering to the ATS is in the interests of

³² Elizabeth Buchanan, *Ice Panda: Navigating China’s Hybrid Antarctic Agenda*, Australian Strategic Policy Institute, August 2024: 4

³³ State Oceanic Administration, *White Paper on China's Antarctic Activities*, State Oceanic Administration, May 22, 2017, accessed 10 October 2024, Online

³⁴ Anne-Marie Brady, *China as a Polar Great Power* (Cambridge: Cambridge University Press, 2017)

³⁵ ABC News, "China Opens First Antarctic Research Station Due South of Australia and New Zealand," February 8, 2024.

³⁶ Elizabeth Buchanan, *Ice Panda: Navigating China’s Hybrid Antarctic Agenda*, Australian Strategic Policy Institute, August 2024: 9

³⁷ Benjamin J. Sacks and Peter Dortmans, "What Are China's Long-Term Antarctic Ambitions?" *RAND Corporation*, April 2024

³⁸ Anne-Marie Brady, "China’s Military Activities in Antarctica," *China's Expanding Antarctic Interests: Implications for Australia*, August 2017: 14

³⁹ Elizabeth Buchanan, "Antarctica in the Grey Zone," *Australian Journal of International Affairs* 76, no. 3 (May 2022): 326

⁴⁰ Elizabeth Buchanan, *Ice Panda: Navigating China’s Hybrid Antarctic Agenda*, Australian Strategic Policy Institute, August 2024: 14

⁴¹ Jeffrey McGee, David Edmiston, and Marcus Haward, *The Future of Antarctica: Scenarios from Classical Geopolitics*, (Singapore: Springer, 2022): 157-59

those nations.⁴² Without the ability to deter the grey-zone and traditional security challenges posed to Antarctica, Australia risks being caught unprepared for a worst-case scenario.

Section 2 - Past and present responses to Antarctic security challenges

Past Defence Policies and Current ADF actions

Up until the end of the Cold War, the ADF maintained a public eye on Antarctica, because since the 1950s, Australia had held the position that “(we) could not afford to have the territory in ‘hostile hands’, as it was within aircraft range of Australia”.⁴³ In the 1987 White Paper, defence went as far as naming Antarctica as a component of the strategic operating environment and a key area for national defence and security interests.⁴⁴ However, thanks to the limits of technology and the general success of the ATS it was recognised that the need for defence activities could be reduced within the AAT and diplomatic solutions should be the preferred method for resolution of issues. In subsequent releases, white papers failed to mention Antarctica at all, until 2009 when it was reintroduced by defence as part of a shift in priority setting, returning it to the operating environment once more, albeit one where substantial military response was not likely until at least 2030.⁴⁵ Yet despite the rising grey-zone challenges and traditional risk as outlined in Section 1, along with the growing concern of climate change, subsequent white papers downplayed the continent as “no credible risk”.⁴⁶ With the first National Defence Strategy released in 2024 after the thorough Defence Strategic Review in 2023, there was likely some hope amongst more pessimistic Antarctic observers that the actions of China and Russia in other theatres would once again bring Antarctica to the fore of defence planning. Yet once again Antarctica was completely overlooked, at least in all publicly available documentation, affirming that the Government could turn a blind eye to ongoing issues and simply hope that nothing unexpected would arise to the south.

Despite the lack of Antarctic policy in any overarching ADF guidance, several functions are undertaken in support of the AAD and in compliance with the ATS. In a submission to a parliamentary inquiry in 2017, the ADF noted several supporting roles it plays including:

- logistics support functions



⁴² Elizabeth Buchanan, "Antarctica in the Grey Zone," *Australian Journal of International Affairs* 76, no. 3 (May 2022): 328

⁴³ US Department of State, "Memorandum of a Conversation," *Foreign Relations of the United States, 1955-1957*, vol. XI, UN and General International Matters, Document 305 (Washington, DC: US Government Printing Office, 14 October 1957).

⁴⁴ Australian Government, *The Defence of Australia (1987 Defence White Paper)* (Canberra: Department of Defence, 1987): 19

⁴⁵ Australian Government, *2009 Defence White Paper* (Canberra: Department of Defence, 2009): 51.

⁴⁶ Elizabeth Buchanan, *Ice Panda: Navigating China's Hybrid Antarctic Agenda*, Australian Strategic Policy Institute, August 2024: 8

- scientific support (geospatial, hydrographical and meteorological)
- expertise in extreme climate, remote, maritime and airborne medicine
- aeromedical evacuation
- contributing to Australia's national responsibilities in the region, notably, support to maritime resource protection tasks.⁴⁷

Regular flights are conducted by the Royal Australian Air Force during summer months, under the auspices of Operation Southern Discovery, along with maritime meteorology and limited infrastructure support.⁴⁸ However, given the rising challenges, capping ADF support at these basic functions is arguably no longer sufficient, especially given recent decisions to abandon construction of an all year aerodrome which would have provided additional capacity to support the AAD and improve their ability to enforce the ATS through inspections without ADF involvement.⁴⁹

Likeminded Nations

Australia's key partners who share interests in Antarctica all approach Antarctic security in similar ways to Australia. New Zealand, Australia's closest neighbour and another state who has a close relationship with Antarctica, focuses its policy on preservation of Antarctic environment and peace through commitment to the ATS.⁵⁰ Like Australia, maintain a Southern approach free of contest is in New Zealand's national interests, and it was the first country to publicly call out military style activities which were being conducted by states exploiting the ATS.⁵¹ They are active in patrolling the Southern Ocean, as demonstrated by the New Zealand plane which identified and singled out the Russian vessel spoofing its location discussed in Section 1.⁵² However, like Australia, New Zealand has a relatively small force and budget available to maintain their national interests in Antarctica and as the grey-zone and more traditional security threats increase, New Zealand's ability to police its strategic operating environment becomes more difficult.

The United States on the other hand, has significant forces and resources available to them. It, like Australia and New Zealand, has been one of the leading countries on the governance and protection of Antarctica since the ATS was established. The United States was the driving force behind drafting the ATS in 1958 and securing a peaceful Antarctica during the Cold War.⁵³ It has the largest presence in Antarctica, including three year-round stations, the largest amount of personnel and even a research station on the

⁴⁷ Department of Defence, Submission to the Joint Standing Committee on the National Capital and External Territories Inquiry into the Adequacy of Australia's Infrastructure Assets and Capability in Antarctica (Canberra: Department of Defence, 2017): 3

⁴⁸ Department of Defence, "Operation Southern Discovery," Australian Government, accessed October 13, 2024, Online

⁴⁹ Chris Johnson, "Australia Needs a Year-Round Runway on Antarctica," The Strategist, Australian Strategic Policy Institute, September 16, 2024, accessed 17 September 2024, Online

⁵⁰ Anne-Marie Brady, "Antarctica as a Site of Strategic Competition: Optimal Responses for Australia and New Zealand," in *Antarctica 2050: Strategic Challenges and Responses – Academic Opinion Papers*, ed. Anne-Marie Brady (Canberra: Australian National University, 2022): 18

⁵¹ New Zealand Ministry of Defence, Strategic Defence Policy Statement 2018 (Wellington: Ministry of Defence, 2018): 22.

⁵² Mathieu Boulègue, *Russia and China in Antarctica and the Southern Ocean: Implications for the Five Eyes*, Sea Power Centre, Royal Australian Navy, 2022: 10

⁵³ Evan T. Bloom, *Meeting Antarctica's Diplomatic Challenges: Joint Approaches for Australia and the United States*, Special Report No. 181 (Canberra: Australian Strategic Policy Institute, February 2022): 6

geographical South Pole.⁵⁴ Although it has a clear national interest in Antarctica, the United States was criticised in recent years, much like Australia is now, for not including Antarctica in its National Security Strategy despite the uptick in Chinese and Russian actions threatening Antarctic security.⁵⁵ Many American national security experts argued that the United States was falling behind in the Arctic presenting a significant threat to North America, and that the actions being undertaken by revisionist states in Antarctica mirrored those in the North Pole delayed by several decades.⁵⁶ Unlike Australia, the United States Government took note of this threat and recently issued its first Antarctic National Security Memorandum in over 30 years. This highlights an intent to “continuously strengthen (the) promotion of transparency, compliance, cooperation, the exchange of best practices, and adherence to relevant norms by all ATS participants.”⁵⁷ It has committed the country to investing in new icebreakers for the Coast Guard, an arm of the military, and refurbishing stations on the continent. Most importantly, it indicates direction from the White House for the military to take notice of the shift in Antarctic politics and to prepare for eventualities where their operational experience in the Arctic may have to be reoriented to the South.

Many other nations are concerned with Russian and Chinese actions in Antarctica, and while all see the value in maintaining a strong ATS, the concerns over mineral exploitation, sovereignty challenges and illegal fishing, as well as the danger of spillover of more traditional security threats from the wider world cannot be ignored. While in the Arctic, NATO and other traditional allies can group together in a more permissive security context for militaries to operate, in Antarctica it is more challenging. Australia, and one of the leaders of this group of likeminded nations with one of the largest stakes in Antarctic security should continue to lead efforts to counter the emerging threats.

Section 3 – Potential actions available to the ADF and the risks

This section aims to provide some theoretically simple actions which the ADF could undertake in the coming years in support of the AAD and securing Australia’s national interests, based upon the potential challenges outlined in Section 1 and the past and ongoing approaches in Section 2. They build on suggestions made by other authors, filling the research gap where recommendations cease at a national level and do not detail what individual arms, like the ADF, should aim to improve. The “Catch-22” of achieving these potential military led responses to Antarctic security without undermining the ATS and legitimising Chinese and Russian actions remains a huge challenge and the ADF has previously been embarrassed by trying to advocate for militarisation.⁵⁸ However, due to the rapid increase in the uncertainty of current great power competition and the exponential advances in technology which make challenging for position on Antarctica far more viable and attractive, at least some of the following recommendations are likely to be prudent to prepare the ADF and make Australia’s ability to protect its national interests credible.

⁵⁴ Ibid: 10

⁵⁵ J.D. Hayworth, "US National Security Planners Must Recognize Antarctica’s Importance," The Defense Post, April 16, 2024, accessed 13 October 2024, Online

⁵⁶ Ryan Burke and Jahara Matissek, "The Polar Trap: China, Russia, and American Power in the Arctic and Antarctica," Journal of Indo-Pacific Affairs, October 25, 2021:

⁵⁷ U.S. Government, "National Security Memorandum on United States Policy on the Antarctic Region," Section 1(d), The White House, May 17, 2024

⁵⁸ ABC News, "Australia Contemplating Dual-Use Military Technology in Antarctica," August 19, 2019

Strengthening Defence Antarctic Policy and Dialogue

The first component of this recommendation would be for the ADF to use the directed two-yearly update cycle for the National Defence Strategy to include Antarctic security as a focus from 2026 onwards. The benefits of this action would cascade for both the ADF and Australia. Internal to the ADF, much like the United States Security Memorandum, planning and professional development would be drawn back into considering Antarctica as a key friction point in the future. There would be no requirement to shift the main effort of the ADF from Deterrence by Denial in the Indo-Pacific, but including a secondary and complementary effort in increasing presence and focus on Antarctica and the Southern Ocean, within the confines of the ATS is an important step. For the broader Government, by the ADF and Defence leading with their policy, a more comprehensive Security Policy could be drafted. Led by the AAD but driven by the Government, this could encompass all the arms of national power and focus resources in a more definitive manner than the current strategy. The security focus, both in support of climate change mitigation and the more traditional threats, will likely increase impetus for funding. This recommendation could be bolstered by also enacting similar advice from scholars, including the creation of an Antarctic Group within Defence.⁵⁹

Increase partnership and interoperability with likeminded nations

The ADF is well versed in integrated operations with other nations, and this should extend to Antarctic security. Experts have advocated for increased collaboration between Australia, New Zealand, and the United States to enhance logistics and maritime patrolling.⁶⁰ The ADF should actively pursue these ends, leveraging unmanned air and maritime systems as they come online, to better patrol the southern approaches and ATS protected areas. AUKUS style collaborations for not just interoperable, but interchangeable ice breaking and polar platforms should be explored by the ADF to make acquisition of further platforms more cost-effective. Additionally, the ADF in collaboration with intelligence agencies could advocate for an intelligence and communications sharing agreement with likeminded states, who may not be in the Five-Eyes intelligence community, to better inform them of the actions of revisionist states and enable more cohesive diplomacy in responding within the ATS. This would have benefits for not only deterring grey-zone and traditional threats, but also with protecting the environment and predicting impacts of climate change. Finally, embedding planners and operators into Arctic exercises to expose them to considerations for polar operations may also be a low cost, but high return action the ADF could make with its many likeminded partners.

⁵⁹ Elizabeth Buchanan, *Ice Panda: Navigating China's Hybrid Antarctic Agenda*, Australian Strategic Policy Institute, August 2024: 16

⁶⁰ Anne-Marie Brady, "Antarctica as a Site of Strategic Competition: Optimal Responses for Australia and New Zealand," in *Antarctica 2050: Strategic Challenges and Responses – Academic Opinion Papers*, ed. Anne-Marie Brady (Canberra: Australian National University, 2022): 19

Advocate for improved infrastructure

Several key pieces of infrastructure should be recommended by the ADF as priorities for the government in support of defending the national interests in Antarctica. The first would be the reversal of the decision to cancel the construction of the all-season runway near Davis Station.⁶¹ This would have numerous security benefits, including redundancy for logistics, improved ability to conduct inspections via aerial platforms and



providing a cooperative hub for other nations in the AAT. The ADF should also seek to leverage its ties with the United States to encourage the Coast Guard to establish a homeport in Australia, potentially co-located with the Royal Australian Navy in Western Australia, creating the infrastructure to not only support inspections and maritime patrolling, but provide a second strategic gateway city to Antarctica as an alternate to Hobart.

Support increased intelligence and security

While sharing intelligence with likeminded allies is a key part of the recommendation above, it goes hand in hand with improving Australia's own ability to conduct reconnaissance and surveillance within the AAT and in support of enforcing the ATS. While the deployment of military systems on or over the AAT is not feasible while adhering to the ATS, increased employment of spaced based platforms, as well as enhancing regulatory patrolling in the Southern Ocean would be areas that the ADF could support broader Antarctic security. In addition, advise and support in protecting the cyber systems of AAD and scientific institutions is a critical function the ADF can easily fulfil, as testing and protecting the cyber domain could deny freedom of action from revisionist forces.⁶²

Increase support to AAD through Operation Southern Discovery

As noted in Section 2, the ADF already provides limited support to AAD, but this could be increased with relatively low impost on the ADF but with potential benefits to the strategic security of Antarctica. One of the biggest areas of risk is that China and Russia cannot be held to account if inspections of their activities cannot be conducted. In general, low numbers of inspections are conducted by all parties⁶³ and Australia has only conducted three sets of inspections over the last decade.⁶⁴ The employment of skilled ADF personnel rotating in generalist roles in the AAT could provide either expertise or

⁶¹ Chris Johnson, "Australia Needs a Year-Round Runway on Antarctica," *The Strategist*, Australian Strategic Policy Institute, September 16, 2024, accessed 17 September 2024, Online

⁶² Shadi Alshdaifat, Brett van Niekerk, and Trishana Ramluckan, "Antarctica and Cyber-Security: Useful Analogy or Exposing Limitations?" in *Proceedings of the 20th European Conference on Cyber Warfare and Security (ECCWS 2021)*, 18 (Curran Associates, 2021): 21

⁶³ Ferhat Kökyay, "Impact of Security Dilemma on Antarctica's Militarization," *Polish Polar Research* 43, no. 2 (2022): 173

⁶⁴ Antarctic Treaty Secretariat, "Inspections Database," *Antarctic Treaty System*, accessed October 13, 2024

relieve the burden on qualified AAD staff to conduct more regular inspections and achieve a deterrence effect on states which may otherwise breach the ATS. Increasing the logistics support of Operation Southern Discovery via more regular airbridge would also relieve pressure on Australia's single Antarctic vessel to support research and inspections.

Conclusion

Antarctica is a wicked problem for Australia to address. The country has a longer history of supporting and leading as part of the ATS, and as such must adhere to its rules around non-militarisation of the continent. However, as revisionist powers increase their grey-zone activities through dual-use technologies, opaque use of military forces and expansion of infrastructure in the AAT, it becomes hard for Australia to address these issues and any potential traditional challenges which may arise without mirroring the competitive behaviours.⁶⁵ This creates a Catch-22 for the ADF, who over the past decades have generally ignored Antarctica in policy and like the rest of the government assumed that our national interests were protected by the ATS. As likeminded nations around the world start to take note of the increasing traditional threats around the southern pole, so to must Australia.

Considering the above, this paper has made recommendations to the ADF specifically, filling a gap where most current commentators stop at a more multi-agency government level. These actions are all relatively low impact, whether it is including Antarctica in Defence policy and discourse, advocating for improvements in infrastructure, using multi-national networks to increase efficiency or simply relieving pressure on the AAD to free them to conduct more accountability inspections. While minor in nature, bringing Antarctic security to the fore and preparing elements of the ADF to better support the defending of national interests in the face of rising tensions on our southern flank can only have a net benefit. By taking these steps in advance, the ADF can aid the broader government in avoiding greater militarisation in the future, and assist in strengthening the ATS rather than add to the challenges being posed by other states.

⁶⁵ Elizabeth Buchanan, "China Is Serious About Antarctica. Australia Should Be Too," *The Strategist*, Australian Strategic Policy Institute, June 14, 2024

References

AAP. *Australian Antarctic Strategy & 20 Year Action Plan: Update 2022*. Australian Government, 2022.

ABC News. "Australia Contemplating Dual-Use Military Technology in Antarctica." August 19, 2019.

ABC News. "China Opens First Antarctic Research Station Due South of Australia and New Zealand." February 8, 2024.

Alshdaifat, Shadi, Brett van Niekerk, and Trishana Ramluckan. "Antarctica and Cyber-Security: Useful Analogy or Exposing Limitations?" In *Proceedings of the 20th European Conference on Cyber Warfare and Security (ECCWS 2021)*, 18, 21. Curran Associates, 2021.

Antarctic Treaty Secretariat. "Inspections Database." *Antarctic Treaty System*. Accessed October 13, 2024.

Antarctic Treaty Secretariat. "Parties to the Antarctic Treaty." *Antarctic Treaty System*. Accessed October 6, 2024. Online.

Antarctic Treaty Secretariat. *The Antarctic Treaty*, 1 December 1959, 402 UNTS 71.

Australian Government. *2009 Defence White Paper*. Canberra: Department of Defence, 2009.

Australian Government. *The Defence of Australia (1987 Defence White Paper)*. Canberra: Department of Defence, 1987.

Australian Government. *Australian Antarctic Territory Acceptance Act 1933*. Sect. 2.

Australian Antarctic Division. "Australian Antarctic Territory." *Australian Antarctic Program*. Accessed October 4, 2024. Online.

Australian Antarctic Division. *Australia's Antarctic Strategy and 20 Year Action Plan: 2022 Update*. 2022.

Australian War College. *Research Questions Asked by Senior Leaders 2024*. AWC707 Additional Resources, 2024.

Bloom, Evan T. *Meeting Antarctica's Diplomatic Challenges: Joint Approaches for Australia and the United States*. Special Report No. 181. Canberra: Australian Strategic Policy Institute, February 2022.

Boulègue, Mathieu. *Russia and China in Antarctica and the Southern Ocean: Implications for the Five Eyes*. Sea Power Centre, Royal Australian Navy, 2022.

Brady, Anne-Marie. *China as a Polar Great Power*. Cambridge: Cambridge University Press, 2017.

Brady, Anne-Marie. "Antarctica as a Site of Strategic Competition: Optimal Responses for Australia and New Zealand." In *Antarctica 2050: Strategic Challenges and Responses – Academic Opinion Papers*, edited by Anne-Marie Brady, 19. Canberra: Australian National University, 2022.

Brady, Anne-Marie. "China's Military Activities in Antarctica." *China's Expanding Antarctic Interests: Implications for Australia*. August 2017.

Buchanan, Elizabeth. *Ice Panda: Navigating China's Hybrid Antarctic Agenda*. Australian Strategic Policy Institute, August 2024.

Buchanan, Elizabeth. "Antarctica in the Grey Zone." *Australian Journal of International Affairs* 76, no. 3 (May 2022): 326–328.

Buchanan, Elizabeth. "China Is Serious About Antarctica. Australia Should Be Too." *The Strategist*, Australian Strategic Policy Institute, June 14, 2024.

Burke, Ryan. *The Polar Pivot: Great Power Competition in the Arctic and Antarctic*. Boulder, CO: Lynne Rienner Publishers, 2022.

Burke, Ryan, and Jahara Matisek. "The Polar Trap: China, Russia, and American Power in the Arctic and Antarctica." *Journal of Indo-Pacific Affairs*, October 25, 2021.

Commission for the Conservation of Antarctic Marine Living Resources. *Report of the Thirty-Ninth Meeting of the Commission*. Virtual Meeting, October 27–30, 2020. Accessed October 9, 2024.

Department of Climate Change, Energy, the Environment and Water. *Australian Antarctic Division Budget and Jobs, 2023*. Accessed October 9, 2024.

Department of Defence. *National Defence Strategy 2024*. Australian Government, 2024.

Department of Defence. *Submission to the Joint Standing Committee on the National Capital and External Territories Inquiry into the Adequacy of Australia's Infrastructure Assets and Capability in Antarctica*. Canberra: Department of Defence, 2017.

Department of Defence. "Operation Southern Discovery." Australian Government. Accessed October 13, 2024.

Dodds, Klaus. "Antarctic Geopolitics." In *Handbook on the Politics of Antarctica*, edited by Klaus Dodds, Alan D. Hemmings, and Peder Roberts. Cheltenham, UK: Edward Elgar Publishing, 2017.

Hayworth, J.D. "US National Security Planners Must Recognize Antarctica's Importance." *The Defense Post*, April 16, 2024. Accessed October 13, 2024.

Johnson, Chris. "Australia Needs a Year-Round Runway on Antarctica." *The Strategist*, Australian Strategic Policy Institute, September 16, 2024. Accessed September 17, 2024.

Kökyay, Ferhat. "Impact of Security Dilemma on Antarctica's Militarization." *Polish Polar Research* 43, no. 2, 2022.

McGee, Jeffrey, David Edmiston, and Marcus Haward. *The Future of Antarctica: Scenarios from Classical Geopolitics*. Singapore: Springer, 2022.

Merriam-Webster. s.v. "Catch-22." *Merriam-Webster.com Dictionary*. Accessed October 13, 2024.

New Zealand Ministry of Defence. *Strategic Defence Policy Statement 2018*. Wellington: Ministry of Defence, 2018.

Norwegian Government. *Report of the Norwegian Antarctic Inspection Under Article VII of the Antarctic Treaty and Article 14 of the Environmental Protocol*. February 2018. Accessed October 9, 2024.

Press, Tony. "Security Challenges of Antarctica and the Southern Ocean." *United Service* 74, no. 1 (March 2023)

Sacks, Benjamin J., and Peter Dortmans. "What Are China's Long-Term Antarctic Ambitions?" *RAND Corporation*, April 2024.

State Oceanic Administration. *White Paper on China's Antarctic Activities*. State Oceanic Administration, May 22, 2017. Accessed October 10, 2024. Online.

Tandon, Ayesha. "Antarctic Sea Ice Maximum in 2024 Is Second Lowest on Record." *Carbon Brief*, October 4, 2024.

U.S. Department of State. "Memorandum of a Conversation." *Foreign Relations of the United States, 1955-1957*, vol. XI, UN and General International Matters, Document 305. Washington, DC: US Government Printing Office, October 14, 1957.

U.S. Government. "National Security Memorandum on United States Policy on the Antarctic Region." Section 1(d). The White House, May 17, 2024.

Wilson, Robert E. "National Interests and Claims in the Antarctic." *Arctic* 17, no. 1 (March 1964)

What is Australia's 'grand strategy' and how can its success be judged?

Major Benjamin Mackie

Major Ben Mackie, Royal Australian Army Nursing Corps, is a clinician and leader who has served in sub-unit command at the Australian Defence Force School of Health and attended Australian Command and Staff Course (Military Art) - Part Time (formally ACSC-Remote) in 2024. He now leads a regional ICU and mentors higher degree research students at Griffith University.

Grand strategies concern the relationship a state desires with others and how that state will build and apply national power to achieve those relationships.¹ Further, a grand strategy uses diverse national power that is often referred to as 'means'.² The literature suggests this diversity can best be understood through the acronym DIME: Diplomacy, Information, Military, and Economic.³ This diversity is not merely a whole-of-government but rather whole-of-nation and, in a globalised world, holds a geopolitical dimension.⁴ An effective grand strategy uses all and every suitable means in a coherent, integrated manner. Australia, as a liberal democratic middle power, is heavily reliant on the free market global economy and the security arrangements that support prosperity.⁵ The current dynamic geopolitical environment⁶ and the growing influence of China in the Indo-Pacific region compels Australia to enact a grand strategy in support of long-term safety and prosperity. In 2023, Australia adopted a balance-of-power and engagement grand strategy⁷ to maintain peace and shape a region to reflect its national interests and shared regional interests. This essay will outline Australia's grand strategy and explore how its effectiveness and success can be measured using the Framework described by the Royal College of Defence Studies.⁸

¹ Peter von Layton, *Grand Strategy* (Erscheinungsort nicht ermittelbar: Peter Layton, 2018).

² Hew Strachan, 'The Lost Meaning of Strategy', *Survival* 47, no. 3 (October 2005): 34, <https://doi.org/10.1080/00396330500248102>.

³ Robert David Steele, *Information Operations: Putting the "I" Back into DIME* (Strategic Studies Institute, US Army War College, 2006).

⁴ Peter Layton, 'Building an Australian Grand Strategy', 17 July 2019, <https://blogs.griffith.edu.au/asiainsights/building-an-australian-grand-strategy/>.

⁵ Wade Stothart, 'Navigating Uncertain Times: The Need for an Australian "Grand Strategy"', Indo-Pacific Strategic Papers, March 2015, <https://www.defence.gov.au/defence-activities/research-innovation/research-publications/navigating-uncertain-times-need-australian-grand-strategy>.

⁶ Department of Defence, 'National Defence: Defence Strategic Review : 2023' (Department of Defence, 2023).

⁷ Penny Wong, 'Australian Interests in a Regional Balance-of-power' (Political, National Press Club, Canberra, ACT, 17 April 2023), <https://www.foreignminister.gov.au/minister/penny-wong/speech/national-press-club-address-australian-interests-regional-balance-power>.

⁸ UK Government, 'Getting Strategy Right (Enough)' (The Royal College of Defence Studies, 2017),

A grand strategy is primarily concerned with building a better future for a nation. As articulated by Peter Layton, a grand strategy is, ‘the art of developing and applying diverse forms of power effectively and efficiently to try to purposefully change the relationship existing between two or more intelligent and adaptive entities’.⁹ For over a decade, Australia has declared through various foreign policy statements and Defence white papers that its national interests and growth are closely linked to open and stable relationships within Southeast Asia and the Indo-Pacific region¹⁰ Changing regional relationships¹¹ has led to a recent shift in policy focus from the Australian government, and applying all elements of national power to achieve two deliberate complementary grand strategies. The decision to enact two mutually reinforcing grand strategies is supported by the literature^{12,13}, which has highlighted that a single grand strategy may not enable a state to achieve all it seeks, and in the case of Australia limit the government into a narrow range of possible domestic and foreign policy options.

Australia has adopted a balance-of-power grand strategy focused on the great power level.¹⁴ Australia as a middle power assumes a key role similar to Canada in stabilising and legitimising the current world order.¹⁵ The underpinning assumption of this strategy is that a superior power, such as China, India, or the United States of America (USA) determines outcomes.¹⁶ Interestingly, Geoff Raby (Australia's Ambassador to China; 2007–2011) highlights that a balancing of power strategy focused on working with those with common interests to maintain a regional balance and economic growth could effectively counter China's use of economic coercion but is not directly focused on China.¹⁷ Further, this approach suggests that a state becomes more powerful by building up military and economic power and forming collective defence alliances. In 2023, the U.S. and Australian governments formalised a new era of US-Australian strategic cooperation, which focuses on collaborations across four pillars: (1) climate and clean energy, (2) defence, (3) economic, and (4) military collaborations.¹⁸ Consequently, the

<https://nebula.wsimg.com/68287520fb0f33e0aad004ced7281f33?AccessKeyId=5F5B89AA45A3D66BEB BD&disposition=0&alloworigin=1>.

⁹ Peter Layton, ‘Defining Grand Strategy’, 2020, <https://thestrategybridge.org/the-bridge/2020/8/17/defining-grand-strategy>

¹⁰ Graeme Dobell, ‘Australia’s Indo-Pacific Hope: Equilibrium’, *The Strategist*, 12 September 2022, <https://www.aspistrategist.org.au/australias-indo-pacific-hope-equilibrium/>.

¹¹ Felix Heiduk, Gudrun Wacker, and Stiftung Wissenschaft Und Politik, ‘From Asia-Pacific to Indo-Pacific: Significance, Implementation and Challenges’, *SWP Research Paper*, 2020, <https://doi.org/10.18449/2020RP09>

¹² Layton, Peter, ‘The Grand Strategies Shaping Australia’s View of the World’ (EASTASIAFORUM, 17 November 2023), <https://eastasiaforum.org/2023/11/17/the-grand-strategies-shaping-australias-view-of-the-world/>.

¹³ Lukas Milevski, ‘Can Grand Strategy Be Mastered?’, *Military Strategy Magazine*, 2017.

¹⁴ Layton, Peter, ‘The Grand Strategies Shaping Australia’s View of the World’.

¹⁵ Stothart, ‘Navigating Uncertain Times: The Need for an Australian “Grand Strategy”’.

¹⁶ Layton, Peter, ‘Executing Australia’s Two Grand Strategies’ (Australian Institute of International Affairs, 4 October 2023), <https://www.internationalaffairs.org.au/australianoutlook/executing-australias-two-grand-strategies/>.

¹⁷ Geoff Raby, *China’s Grand Strategy and Australia’s Future in the New Global Order* (Carlton, Victoria: Melbourne University Press, 2020).

¹⁸ U.S. Department of State, ‘The United States’ Enduring Commitment to the Indo-Pacific: Marking Two Years Since the Release of the Administration’s Indo-Pacific Strategy’, 9

Australian Defence Force (ADF) has shifted focus and aligned key military capabilities with their US allies. For example, AUKUS is a trilateral securing partnership between Australia, the United Kingdom, and the USA for the Indo-Pacific region. Under AUKUS, Australia declared it would acquire nuclear attack submarines¹⁹ because it believed this would provide a key deterrent against aggression and generate a strategic equilibrium in the region. The balancing grand strategy will require the Australian foreign trade and international relations division to positively influence the regional and global environment, consistent with Australia's national interests.

A fundamental relationship within any grand strategy is the relationship between the political objectives and the use of the military. Within the overarching balance-of-power grand strategy, the ADF has adopted the strategy of denial. The Defence Strategic Review (DSR) states that a strategy of denial is 'a defensive approach designed to stop an adversary from succeeding in its goal to coerce states through force, or the threatened use of force, to achieve dominance. Denial is associated with the ability and intent to defend against, and defeat, an act of aggression.'²⁰ Forming coalitions is a key approach embedded within a strategy of denial, and as Gray describes acts like a 'bridge'²¹ linking Australia's balance-of-power strategy and accepted themes for military coalition formation including increased international legitimacy, improved chances of both international and national support, and improved deterrence.²²

Economic power is also a critical element of grand strategy²³ and is embedded within the Australian balance-of-power grand strategy. For example, Australia has secured several bilateral and multilateral economic agreements with Indonesia, the Pacific Islands, India, Japan, and South Korea.^{24,25} In 2021, a strategic partnership between Australia and the Association of Southeast Asian Nations (ASEAN) was endorsed,²⁶ and provided Australia with 'substantial geopolitical weight.'²⁷ The initiative is valued at A\$154 million over ten years and represents the largest-ever increase in Australia's development cooperation program with ASEAN. The program includes financing smart cities, digitisation, technology innovation, digital skills training, and a scholarship program in the

February 2024, <https://www.state.gov/wp-content/uploads/2024/02/Indo-Pacific-Strategy-Second-Anniversary-Fact-Sheet.pdf>.

¹⁹ U.S. Department of Defence, n.d., <https://www.defense.gov/Spotlights/AUKUS/>.

²⁰ Department of Defence, 'National Defence: Defence Strategic Review: 2023' (Department of Defence, 2023), 49.

²¹ Colin S. Gray, *Strategy and History: Essays on Theory and Practice* (London: Routledge, 2006), 164.

²² Ray Leggatt, 'Developing the Coalition – Can We Do More?', 2019, <https://theforge.defence.gov.au/article/developing-coalition-can-we-do-more>.

²³ Wade Stothart, 'Navigating Uncertain Times: The Need for an Australian "Grand Strategy"', *Indo-Pacific Strategic Papers*, March 2015, <https://www.defence.gov.au/defence-activities/research-innovation/research-publications/navigating-uncertain-times-need-australian-grand-strategy>

²⁴ Thomas Wilkins, 'Middle Power Hedging in the Era of Security/Economic Disconnect: Australia, Japan, and the "Special Strategic Partnership"', *International Relations of the Asia-Pacific* 23, no. 1 (2023): 93– 127.

²⁵ Adam Triggs and Peter Drysdale, 'Complex Trade-Offs: Economic Openness and Security in Australia', *Navigating Prosperity and Security in East Asia*, 2023, 53.

²⁶ Australian Government, 'The ASEAN-Australia Comprehensive Strategic Partnership', 27 October 2021, <https://asean.mission.gov.au/aesn/CSP.html>.

²⁷ Raby, *China's Grand Strategy and Australia's Future in the New Global Order*.

areas of maritime, connectivity, economic development, and sustainable development goals. Additionally, The Quadrilateral Security Dialogue (QSD; referred to as the Quad) is a strategic security dialogue between Australia, India, Japan, and the US released a joint statement²⁸ recommitting to working in partnership with Pacific Island countries to achieve shared aspirations and address shared challenges in achieving sustainable consumption and production due to climate change.

Australia has also adopted an engagement grand strategy focused on middle and smaller powers in the region. This regional focus by Australia reflects a contemporary view that grand strategy is more than the military, politics, economics, and technology, and the significance of geography must be acknowledged.²⁹ International best-selling author Tim Marshall in *Prisoners of Geography* also emphasises that geopolitics affects every country, and geography remains crucial to the success of a state today and into the future.³⁰ Thus, the engagement grand strategy involves Australia working with other states in the Indo-Pacific region to achieve common goals. For Australia, the Minister for Foreign Affairs, Hon Penny Wong has declared her government's key focus will be to work with South-East Asia and the Pacific 'to enhance our collective security and prosperity.'³¹ Supporting regional states to be more resilient to outside pressures aligns with a balance-of-power grand strategy.³²

The ADF has also supported Australia's engagement grand strategy. One example of a multinational objective led by the ADF that strengthens Australia's national interest is the malaria mitigation program.³³ Led by the ADF Malaria and Infectious Disease Institute in partnership with the Vietnam People's Army and the Papua New Guinea Defence Force, and nested within the Global Health program, the malaria mitigation program was designed with extensive collaboration with host nation stakeholders, empowered local institutions and governance systems, and built the capacity of the host nation to achieve independence from Australian. Employing health specialists from the ADF met the strategic policy requirements of all nations involved and strengthened Australia's reputation in the Asian-Pacific region. Additionally, improving the cultural competence of our region across the Australian Army has been a key focus of ADF leadership for several years. For instance, key Asian-Pacific educational forums have been initiated because understanding the geopolitics of the world is seen as being fundamental to those who serve as military professionals in the ADF.³⁴

²⁸ 'Quad Leaders' Joint Statement', 20 May 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/quad-leaders-joint-statement/>.

²⁹ Colin S. Gray, *Strategy and History: Essays on Theory and Practice* (London: Routledge, 2006).

³⁰ Tim Marshall, *Prisoners of Geography: Ten Maps That Tell You Everything You Need to Know about Global Politics*, Paperback edition (London: Elliot and Thompson Limited, 2019).

³¹ Penny Wong, 'Australian Interests in a Regional Balance-of-power' (Political, National Press Club, Canberra, ACT, 17 April 2023), <https://www.foreignminister.gov.au/minister/penny-wong/speech/national-press-club-address-australian-interests-regional-balance-power>.

³² Layton, Peter, 'The Grand Strategies Shaping Australia's View of the World' (EASTASIAFORUM, 17 November 2023), <https://eastasiaforum.org/2023/11/17/the-grand-strategies-shaping-australias-view-of-the-world/>.

³³ Michael Charles Reade et al., 'Australian Defence Force Global Health Engagement through Malaria and Other Vectorborne Disease Programmes in the Pacific and Southeast Asia', *BMJ Military Health*, 10 May 2023, e002335, <https://doi.org/10.1136/military-2022-002335>.

³⁴ Cove The, 'Know Your Region Series – #KYR', *The Cove*, 29 May 2021, <https://cove.army.gov.au/article/know-your-region-series-kyr>.

It is widely accepted in the literature, that grand strategy operates in a specific historical and contemporary circumstance,³⁵ and that strategy is a process, not an endpoint.³⁶ Tanev emphasises that 'grand strategy is not about a single achievement of this extreme but rather about the long-term position at the extreme heights'.³⁷ Further, he argues grand strategy should cause a multiplier effect of securing a chain of accumulated extreme peaks for a state. For instance, the successful transformation of Germany after World War II and South Korea from authoritarian states with weak economic institutions to democratic regimes with strong economies are historical examples of successful grand strategies that focused on export-led economic growth.³⁸ Because grand strategy is an iterative process undergoing constant adaptation to shifting conditions and circumstances in a world where chance, uncertainty, and ambiguity dominate³⁹ judging its success is difficult. It is challenging to evaluate the success of the Australian balance of power and engagement grand strategy without specific policy ends, however, the Royal College of Defence Studies⁴⁰ provides a pragmatic framework to inform an assessment of key policy decisions over the past 12 months. To evaluate the effectiveness of the two Australian grand strategies, the experience of the College suggests it should pass five simple tests: 'first, it must be acceptable; second, it must be feasible; third, it must be suitable to the circumstances, fourth it must be sustainable'.⁴¹

For a grand strategy to be successful it must first be acceptable. In the Australian context, the government's grand strategy must gain domestic approval to be successfully implemented. Further, the role of government is to represent the Australian people and enact policy that is important to them. Therefore, the Australian public's views and perceptions of recent policy announcements such as AUKUS and the Quad should hold value and could be regarded as a surrogate metric of the success of the current balance of power and engagement grand strategies. The recent Lowy Institute Poll reported the

³⁵ Richard Rosecrance and Arthur Stein, 'Beyond Realism: The Study of Grand Strategy', in *Domestic Bases of Grand Strategy* (Ithaca, New York: Cornell University Press, 1993), 3–21, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2863654.

³⁶ James Ellis, James Mattis, and Kori Schake, 'Blue Print for America', in *Restoring Our National Security* (Stanford University: Hoover Institution, 2016), Chp 10.

³⁷ Todor Tanev, 'Efficiency and Effectiveness of Grand Strategy', *Публични Политики*. Вг 3, no. 1 (2012): 23.

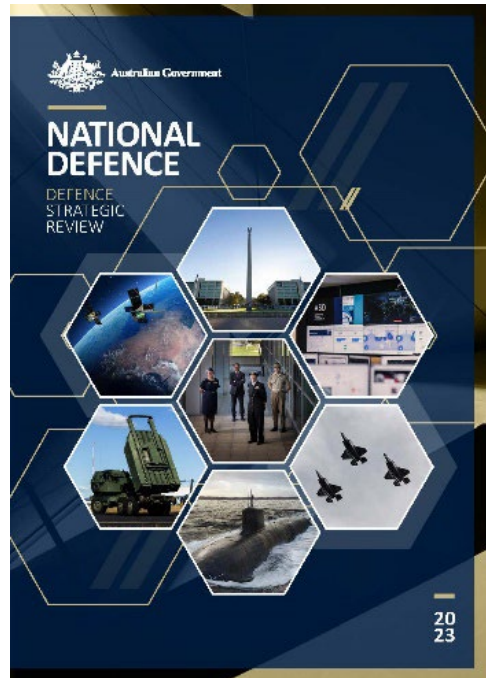
³⁸ Ithamar Zacharie, 'The Determinants of Reconstruction: Why Were the 1960-1990 Post-World War II Transformations in West Germany and South Korea Successful?', *Political Analysis* 17, no. 1 (2015): 7.

³⁹ Harry R. Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy*, Letort Papers, no. 12 (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 2006).

⁴⁰ UK Government, 'Getting Strategy Right (Enough)' (The Royal College of Defence Studies, 2017), <https://nebula.wsimg.com/68287520fb0f33e0aad004ced7281f33?AccessKeyId=5F5B89AA45A3D66BEB&disposition=0&alloworigin=1>.

⁴¹ UK Government, 25.

results of a national survey of 2,077 Australian adults between 14 and 26 March 2023⁴². Survey data from this poll suggests that Australians' feelings of safety have improved over the past year, and 63% of the population surveyed (n= 1, 308) stated they feel 'very safe' or 'safe'. Half of those sampled reported AUKUS will make Australia safer (49%; n =1, 017), and a slightly lower number say it will make the region safer (46%; n = 955). Similarly, half of the participants felt the Quad partnership between Australia, India, Japan, and the United States would make Australia (51%) and the region (50%) safer.⁴³ The Lowy poll data suggests that the grand strategies proposed by the state are acceptable to the Australian public, and the government had a well-crafted strategic narrative that has fostered buy-in from the nation resulting in regional and international legitimacy.



Secondly, for a grand strategy to be successful it must be feasible, and an Australian balance-of- power grand strategy only works if the ADF can threaten or use violence. The 2023 DSR⁴⁴ identified that Australia's strategic circumstances now require the ADF to realign and contribute to shaping the strategic environment, deter potential adversaries, and deny adversaries the ability to achieve objectives contrary to Australia's interests. The DSR endorsed within the AUKUS agreement the acquisition of a conventionally armed, nuclear-powered submarine capability, including the establishment of an Australian Submarine Agency⁴⁵. Others strongly support the decision by Australia to 'take a long-term position on a proven weapon system that will deliver ancillary national security benefits and access to new technology over the next 20 years, and industrial cooperation with the UK and US.'⁴⁶ The literature supports the re-posturing of the ADF because the current strategic risks Australia faces require a new approach to defence planning, force posture, force structure, capability development, and acquisition.^{47,48} A renewed and strengthened

⁴² Ryan Neelam, 'Poll 2023', Lowy Institute Poll 2023, 21 June 2023, <https://poll.lowyinstitute.org/report/2023/>.

⁴³ Neelam.

⁴⁴ Department of Defence, 'National Defence: Defence Strategic Review : 2023' (Department of Defence, 2023).

⁴⁵ Department of Defence.

⁴⁶ Australian Defence Business Review, 'Australia's AUKUS Opportunity: Fixing National to Tactical', 3 January 2022, <https://adbr.com.au/aukus-airpower-advantage/>.

⁴⁷ Sam Roggeveen and Mick Ryan, 'Conversations: Military Strategist Mick Ryan on Australia Defence Strategic Review', 2023.

⁴⁸ Layton, Peter, 'The Defence Gaps in Australia's Emerging Grand Strategies' (Australian Strategic Policy Institute: The Strategist, 5 October 2023),

alliance with the US remains central to Australia's security and is embedded in key policy decisions such as AUKUS and the Quad. To further its deterrent effect, Australia is now buying new long-range strike missiles, and anti-ship missiles, upgrading northern defence bases, enhanced surface combat fleet⁴⁹, and developing offensive cyber capabilities.⁵⁰ Interestingly, the Australian Government's investment in military technology, hardware, and personnel is planned over the next two decades despite the DSR assessment that a threat to Australia's national interest is most likely to occur in the next three to five years. Compounding the challenges for the ADF is the need for a new force structure, which is difficult in the current environment of poor recruitment and retention.⁵¹ Finally, the ADF acquisition process and bureaucracy have also been highlighted as key barriers⁵² to achieving key DSR recommendations because the search for the perfect has become the enemy of the good,⁵³ and Australia lacks the equipment and domestic industry base to enact key defence projects. Thus, ADF alone is unlikely to successfully provide the deterrent and war-fighting force to underpin the balance of power grand strategy but alliances such as AUKUS may afford the Australian industry base more time to deliver what is recommended within the DSR.

Thirdly, for a grand strategy to be successful it must be suitable to the circumstances. Resilience to cyber and foreign interference is a contemporary issue for industrial countries such as Australia.⁵⁴ Nested within the balance of power strategy is the 2023–2030 Australian Cyber Security Strategy. The Australian Cyber and security strategy aims to make Australia a world leader in cyber security by 2030⁵⁵ and has led to recent changes to Australia's national security laws. For instance, federal laws have been updated to criminalise foreign interference with specific foreign telecom firms blocked, foreign investment rules strengthened, critical infrastructure regulations extended, and counters to misinformation and disinformation policies introduced.⁵⁶ The unique circumstances of Australia have also been clearly articulated by the Australian minister for foreign affairs, Senator the Hon Penny Wong, when she linked the centrality of geography to Australia's grand strategy of engagement because of the strategic

<https://www.aspistrategist.org.au/the-defence-gaps-in-australias-emerging-grand-strategies/>.

⁴⁹ Australian Government, 'Enhanced Lethality Surface Combatant Fleet Independent Analysis of Navy's Surface Combatant Fleet', 2024, file:///C:/Users/61432/Downloads/Enhanced_Lethality_Surface_Combatant_Fleet_web.pdf.

⁵⁰ Layton, Peter, 'The Grand Strategies Shaping Australia's View of the World' (EASTASIAFORUM, 17 November 2023), <https://eastasiaforum.org/2023/11/17/the-grand-strategies-shaping-australias-view-of-the-world/>.

⁵¹ Shane Ivimey, 'Defence Strategic Review: Air Force Reserve Workforce Targeted Re-engagement', *Air/Space*, 2023, 33262237.

⁵² Roggeveen and Ryan, 'Conversations: Military Strategist Mick Ryan on Australia Defence Strategic Review'.

⁵³ Department of Defence, 'Defence Strategic Review: 2023'.

⁵⁴ Rob Manwaring and Josh Holloway, 'Resilience to Cyber-Enabled Foreign Interference: Citizen Understanding and Threat Perceptions', *Defence Studies* 23, no. 2 (2023): 334–57.

⁵⁵ Dan Jerker B. Svantesson, 'Australia's Cyber Security Reform—an Update', *International Cybersecurity Law Review*, 2023, 1–4.

⁵⁶ Layton, Peter, 'The Grand Strategies Shaping Australia's View of the World' (EasAsiaForum, 17 November 2023), <https://eastasiaforum.org/2023/11/17/the-grand-strategies-shaping-australias-view-of-the-world/>.

importance of Pacific islands to Australia's security.⁵⁷ Consequently, numerous economic agreements have recently been reached between Australia's regional partners including the Pacific Agreement on Closer Economic Relations, the Indonesia-Australia Comprehensive Economic Partnership, the Regional Comprehensive Economic Partnership, and the Australia-India economic cooperation and trade agreement. Further, there is now an Office of the Pacific and an Australia Pacific Security College.⁵⁸ A national strategy aiming for greater trade and investment between Australia and Southeast Asia has also been recently announced.⁵⁹ The ADF exercises routinely with regional nations, with the ADF's flagship regional engagement activity Indo-Pacific Endeavour (IPE) completed in 2023. On balance, it does appear that the contemporary circumstances that Australia exists have driven numerous proactive initiatives both economic, and military in the region to support the grand balance of power and engagement grand strategies.

Fourthly, for a grand strategy to be successful it must be sustainable and requires a whole government investment involving diplomatic, information, military, and economic power. Both Australian grand strategies will require adequate stable resourcing into the future, requiring government budgets to consistently support a diverse range of projects in trade, defence, regional development, and aid. Current expert opinion suggests the ADF has inadequate resources to address the DSR recommendations.⁶⁰ Thus, for the grand strategy to be sustainable the ADF needs more certainty about its funding⁶¹, and elements of sustainment and operating budgets must be reprioritised to support Defence's focus on the contemporary strategic threats.⁶² Further, the literature has highlighted that for the two grand strategies to be viable there is an urgent need for improved Southeast Asia literacy across Australia's business, government, education, and community sectors.⁶³ Additionally, others have highlighted the need for sectoral business missions in the region, more capable business chambers, more professional exchanges and internships, and for Australia to be a substantial regional investor using monies from its corporations, capital markets, national savings, and superannuation funds.⁶⁴ Over the last decade, successive Australian governments have flipped their

⁵⁷ Penny Wong, 'Australian Interests in a Regional Balance of Power' (Political, National Press Club, Canberra, ACT, 17 April 2023), <https://www.foreignminister.gov.au/minister/penny-wong/speech/national-press-club-address-australian-interests-regional-balance-power>.

⁵⁸ Joanne Wallis et al., 'Security Cooperation in the Pacific Islands: Architecture, Complex, Community, or Something Else?' *International Relations of the Asia-Pacific* 23, no. 2 (2023): 263–96.

⁵⁹ Layton, Peter, 'Executing Australia's Two Grand Strategies' (Australian Institute of International Affairs, 4 October 2023), <https://www.internationalaffairs.org.au/australianoutlook/executing-australias-two-grand-strategies/>.

⁶⁰ Marcus Hellyer, 'Defence Budget 2023-24 – Nervous Times Ahead', *Australian Defence Magazine*, 12 June 2023, <https://www.australiandefence.com.au/defence/budget-policy/defence-budget-2023-24-nervous-times-ahead>.

⁶¹ Nicole Brangwin and David Watt, 'The State of Australia's Defence: A Quick Guide', 27 July 2022, https://www.apf.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/rp/rp2223/Quick_Guides/StateofAustraliasDefence.

⁶² Department of Defence, 'Defence Strategic Review: 2023', 81.

⁶³ Nicholas Moore, *Invested: Australia's Southeast Asia Economic Strategy to 2040* (Canberra: Department of Foreign Affairs and Trade, 2023).

⁶⁴ Layton, Peter, 'The Grand Strategies Shaping Australia's View of the World'.

priority in resourcing Australia's diplomatic capability. The former Australian Liberal government cut \$11.8 billion in development programs, which has been corrected with the current Labor government's first budget,⁶⁵ however, future governments may again reprioritise their investment in key foreign services such as the Department of Foreign Affairs and Trade putting the grand strategy of engagement at risk.

This essay has detailed how the balance of power and engagement grand strategies set out a path for Australia into the future, however, their success is uncertain. The literature has emphasised that grand strategies are whole-of-government, involving diplomatic, informational, military, and economic power. Consequently, the two grand strategies Australia adopted in 2023 strive to build national power in a way that will allow the state to positively influence the regional and global geopolitical environment. These two strategies call for different skill sets at the national, organisational, and individual levels. An analysis of economic policy, social policy and defence capabilities decisions over the past 12 months suggests that the two grand strategies could make Australia domestically strong and support a stable international system, based on the rule of law and open free trading. Further, while the newly enacted grand strategies are difficult to evaluate in this essay, the College framework has revealed that they have led to proactive policy initiatives, which recognise Australia's unique geopolitical position as a middle power. Specific policy ends are needed to enable a long-term assessment of these strategies' success, and barriers in Australia's domestic industry capabilities may delay key defence material projects.

Editorial Note: This paper was written prior to the release of the National Defence Strategy 2024.

⁶⁵ Wong, 'Australian Interests in a Regional Balance of Power'.

References

Australian Defence Business Review. 'Australia's AUKUS Opportunity: Fixing National to Tactical', 3 January 2022. <https://adbr.com.au/aukus-airpower-advantage/>.

Australian Government. 'Enhanced Lethality Surface Combatant Fleet Independent Analysis of Navy's Surface Combatant Fleet', 2024. file:///C:/Users/61432/Downloads/Enhanced_Lethality_Surface_Combatant_Fleet_web.pdf.

Bergmann, Kym. 'Fixing Defence Acquisition-a Greater Role for Industry?' *Asia-Pacific Defence Reporter* 49, no. 5 (2023).

Brangwin, Nicole, and David Watt. 'The State of Australia's Defence: A Quick Guide', 27 July 2022. https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/rp/rp2223/Quick_Guides/StateofAustraliasDefence.

Department of Defence. 'National Defence: Defence Strategic Review: 2023'. Department of Defence, 2023.

Dobell, Graeme. 'Australia's Indo-Pacific Hope: Equilibrium'. *The Strategist*, 12 September 2022. <https://www.aspistrategist.org.au/australias-indo-pacific-hope-equilibrium/>.

Gray, Colin S. *Strategy and History: Essays on Theory and Practice*. London: Routledge, 2006.

Heiduk, Felix, Gudrun Wacker, and Stiftung Wissenschaft Und Politik. 'From Asia-Pacific to Indo-Pacific: Significance, Implementation and Challenges'. *SWP Research Paper*, 2020. <https://doi.org/10.18449/2020RP09>.

Hellyer, Marcus. 'Defence Budget 2023-24 – Nervous Times Ahead'. *Australian Defence Magazine*, 12 June 2023. <https://www.australiandefence.com.au/defence/budget-policy/defence-budget-2023-24-nervous-times-ahead>.

Ivimey, Shane. 'Defence Strategic Review: Air Force Reserve Workforce Targeted Reengagement'. *Air/Space*, 2023, 33262237.

Layton, Peter. 'Building an Australian Grand Strategy', 17 July 2019. <https://blogs.griffith.edu.au/asiainsights/building-an-australian-grand-strategy/>.

Layton, Peter. 'Defining Grand Strategy', 2020. <https://thestrategybridge.org/the-bridge/2020/8/17/defining-grand-strategy>.

Layton, Peter. 'Executing Australia's Two Grand Strategies'. Australian Institute of International Affairs, 4 October 2023. <https://www.internationalaffairs.org.au/australianoutlook/executing-australias-two-grand-strategies/>.

Layton, Peter. 'The Grand Strategies Shaping Australia's View of the World'. EastAsiaForum, 17 November 2023. <https://eastasiaforum.org/2023/11/17/the-grand->

strategies-shaping- australian-view-of-the-world/.

Layton, Peter von. *Grand Strategy*. Erscheinungsort nicht ermittelbar: Peter Layton, 2018.

Leggatt, Ray. 'Developing the Coalition – Can We Do More?', 2019.
<https://theforge.defence.gov.au/article/developing-coalition-can-we-do-more>.

Manwaring, Rob, and Josh Holloway. 'Resilience to Cyber-Enabled Foreign Interference: Citizen Understanding and Threat Perceptions'. *Defence Studies* 23, no. 2 (2023): 334–57.

Marshall, Tim. *Prisoners of Geography: Ten Maps That Tell You Everything You Need to Know about Global Politics*. Paperback edition. London: Elliot and Thompson Limited, 2019.

Milevski, Lukas. 'Can Grand Strategy Be Mastered?' *Military Strategy Magazine*, 2017.
Moore, Nicholas. *Invested: Australia's Southeast Asia Economic Strategy to 2040*. Canberra: Department of Foreign Affairs and Trade, 2023.

———. *Invested: Australia's Southeast Asia economic strategy to 2040*. Canberra: Department of Foreign Affairs and Trade, 2023.

Neelam, Ryan. 'Poll 2023'. Lowy Institute Poll 2023, 21 June 2023.
<https://poll.lowyinstitute.org/report/2023/>.

'Quad Leaders' Joint Statement'. *The White House*, 20 May 2023.
<https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/quad-leaders-joint-statement/>.

Raby, Geoff. *China's Grand Strategy and Australia's Future in the New Global Order*. Carlton, Victoria: Melbourne University Press, 2020.

Reade, Michael Charles, A Auliff, B McPherson, and M Edstein. 'Australian Defence Force Global Health Engagement through Malaria and Other Vectorborne Disease Programmes in the Pacific and Southeast Asia'. *BMJ Military Health*, 10 May 2023, e002335. <https://doi.org/10.1136/military-2022-002335>.

Roggeveen, Sam, and Mick Ryan. 'Conversations: Military Strategist Mick Ryan on Australia Defence Strategic Review', 2023.

Rosecrance, Richard, and Arthur Stein. 'Beyond Realism: The Study of Grand Strategy'. In *Domestic Bases of Grand Strategy*, 3–21. Ithaca, New York: Cornell University Press, 1993. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2863654.

Steele, Robert David. *Information Operations: Putting the "I" Back into DIME*. Strategic Studies Institute, US Army War College, 2006.

Stothart, Wade. 'Navigating Uncertain Times: The Need for an Australian "Grand Strategy"'. INDO- PACIFIC STRATEGIC PAPERS, March 2015.
<https://www.defence.gov.au/defence-activities/research-innovation/research-publications/navigating-uncertain-times-need- australian-grand-strategy>.

Strachan, Hew. 'The Lost Meaning of Strategy'. *Survival* 47, no. 3 (October 2005): 33–54. <https://doi.org/10.1080/00396330500248102>.

Svantesson, Dan Jerker B. 'Australia's Cyber Security Reform—an Update'. *International Cybersecurity Law Review*, 2023, 1–4.

Tanev, Todor. 'Efficiency and Effectiveness of Grand Strategy'. *Публични Политики*. Bg 3, no. 1 (2012): 19–31.

The Cove. 'Know Your Region Series – #KYR'. *The Cove*, 29 May 2021. <https://cove.army.gov.au/article/know-your-region-series-kyr>.

Triggs, Adam, and Peter Drysdale. 'Complex Trade-Offs: Economic Openness and Security in Australia'. *Navigating Prosperity and Security in East Asia*, 2023, 53.

UK Government. 'Getting Strategy Right (Enough)'. The Royal College of Defence Studies, 2017. <https://nebula.wsimg.com/68287520fb0f33e0aad004ced7281f33?AccessKeyId=5F5B89AA45A3D66BEBBD&disposition=0&alloworigin=1>.

UK Government. 'Getting Strategy Right (Enough)'. The Royal College of Defence Studies, 2017. <https://nebula.wsimg.com/68287520fb0f33e0aad004ced7281f33?AccessKeyId=5F5B89AA45A3D66BEBBD&disposition=0&alloworigin=1>.

U.S. Department of State. 'The United States' Enduring Commitment to the Indo-Pacific: Marking Two Years Since the Release of the Administration's Indo-Pacific Strategy', 9 February 2024. <https://www.state.gov/wp-content/uploads/2024/02/Indo-Pacific-Strategy-Second-Anniversary-Fact-Sheet.pdf>.

Wallis, Joanne, Henrietta McNeill, James Batley, and Anna Powles. 'Security Cooperation in the Pacific Islands: Architecture, Complex, Community, or Something Else?' *International Relations of the Asia-Pacific* 23, no. 2 (2023): 263–96.

Wilkins, Thomas. 'Middle Power Hedging in the Era of Security/Economic Disconnect: Australia, Japan, and the "Special Strategic Partnership"'. *International Relations of the Asia-Pacific* 23, no. 1 (2023): 93–127.

Wong, Penny. 'Australian Interests in a Regional Balance of Power'. Political, National Press Club, Canberra, ACT, 17 April 2023. <https://www.foreignminister.gov.au/minister/penny-wong/speech/national-press-club-address-australian-interests-regional-balance-power>.

Yarger, Harry R. *Strategic Theory for the 21st Century: The Little Book on Big Strategy*. Letort Papers, no. 12. Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 2006.

Zacharie, Ithamar. 'The Determinants of Reconstruction: Why Were the 1960-1990 Post-World War II Transformations in West Germany and South Korea Successful?' *Political Analysis* 17, no. 1 (2015): 7

How can Australia best use collaborative combat aircraft to execute its strategy of denial?

Wing Commander Michael Olsen

Wing Commander Michael Olsen is an Aeronautical Engineer, qualified Flight Test Engineer and a graduate of the Australian Command and Staff Course (Military Art) class of 2024. He is currently posted to the Guided Weapons Production Capability Branch within the Guided Weapons and Explosive Ordnance Group in Canberra. He is the Project Engineering Manager working to uplift Australian industry so they can manufacture of guided weapon subsystems and components.

INTRODUCTION

In an era marked by rapid technological advancements and evolving military threats, Australia's defence strategy has increasingly focused on the adoption of new long-range capabilities to safeguard its sovereignty. One critical aspect of this approach is the implementation of a deterrence-by-denial strategy designed to prevent adversaries from projecting power upon Australian territory. Australia has invested heavily in nuclear-powered submarines as the cornerstone capability of the deterrence strategy, but new submarines will not be delivered until the 2030s. Australia is also seeking to enhance deterrence during a period where the Australian Defence Force (ADF) is struggling to meet recruitment targets and is objectively shrinking in terms of manpower.¹ The adoption of uncrewed systems provides an opportunity to promptly increase the lethality and range of Australia's air domain force projection capability. Moreover, within the air domain, the Defence Strategic Review (DSR) identified that aircrew shortages for air combat capabilities are insufficient to operate at high tempo, so the adoption of uncrewed systems can mitigate this shortfall and achieve more with the limited aircrew cohort.²

Collaborative Combat Aircraft (CCA), autonomous systems capable of enhancing the operational range and lethality of the ADF, have matured to become a viable force structure option. This essay answers the question of how Australia can best use CCAs to execute its strategy of denial. By adopting CCAs tailored towards countering the launch platforms for air-launched cruise missiles and surface-launched land-attack cruise missiles, Australia can generate affordable mass capable of 'impactful projection' with a sovereign production capacity to replace aircraft lost to attrition. These systems offer a cost-effective solution to countering modern threats, particularly as Australia's strategic environment becomes increasingly contested with the rise of China.

This essay argues that cruise missile attacks on northern Australia constitute a credible threat that can be countered by using CCAs to hold the cruise missile launch platforms

¹ Michael Shoebridge, "As Defence's Core Functions Fail, What's the Plan for Change?," Strategic Analysis Australia, November 30, 2023, <https://strategicanalysis.org/as-defences-core-functions-fail-whats-the-plan-for-change/>.

² Commonwealth of Australia, "National Defence: Defence Strategic Review 2023 | About | Defence" (Commonwealth of Australia, Department of Defence), 61, accessed February 17, 2024, <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>.

at risk. Given that cruise missiles can be most readily launched from long-range bombers or surface action groups, the essay will then argue how the attributes of CCAs can best be used to counter these threats. Finally, the essay will argue that for the deterrent effect of CCAs to be credible and provide a means of asymmetric cost exchange, Australia must possess a sovereign CCA design, development and manufacturing capability for the types of CCAs most likely to be subject to attrition in a defensive scenario.

Strategy of denial

Australia has adopted a national defence strategy of deterrence by denial, which requires the pursuit of capabilities that improve the range and lethality of the ADF. These capabilities are critical to the ADF's ability to credibly hold adversary forces at risk if they seek to project military power against Australian territory and the northern approaches. The National Defence Strategy 2024 (NDS) states that Australia requires an enhanced 'capacity to deter coercion and to increase the ADF's capacity for impactful projection'.³ Impactful projection demands the imposition of costs upon an adversary, at long ranges, to deter aggressive action against Australia.⁴ The ADF Theatre Concept, Concept ASPIRE, details how Australia will seek to impose unacceptable costs on an adversary. The concept concedes that an adversary may decide to attack Australia if the cost is low and is outweighed by the benefits. To deter attacks, Concept ASPIRE outlines various ways to impose costs upon an adversary. Cost imposition can be as direct as destroying adversary forces or may include broader costs such as 'delay, reputational damage, economic penalty or military advantage'.⁵ CCAs provide a unique set of attributes from a force design and operational perspective that can enhance Australia's ability to set the cost exchange ratio in their favour. Specifically, CCAs should contribute to the defence of Australia and the northern approaches with capabilities that impose costs at long ranges.

What is a collaborative combat aircraft?

A CCA is a specific type of autonomous collaborative platform (ACP) that incorporates high levels of autonomy to enable human-machine teaming with crewed aircraft to execute air combat missions. ACPs are, in turn, Uncrewed Air Systems (UAS) that are comprised of uncrewed air vehicles (UAV), ground control stations (GCS) and, in some cases, a command and control system or segment. Given the focus on air combat roles, CCAs are, therefore, part of two overlapping subtypes of UAS: ACPs and uncrewed combat air systems (UCAS). ACPs incorporate high levels of autonomy to conduct airborne missions such as aerial refuelling, ISR or transport and CCAs are the specific type of ACP that conduct air combat missions.⁶ The United States Air Force (USAF) differentiates ACPs from current-generation UAVs in that ACPs are intended for use 'in conjunction with other combat aircraft to perform a wide range of missions in contested

³ Commonwealth of Australia, "National Defence Strategy" (Department of Defence, April 2024), 37.

⁴ Marcus Hellyer, "'Impactful Projection': A Porcupine with Very Long Quills," *The Strategist*, November 18, 2022, <https://www.aspistrategist.org.au/impactful-projection-a-porcupine-with-very-long-quills/>.

⁵ Commonwealth of Australia, *ADF Concept ASPIRE - The Australian Defence Force's Theatre Concept, Edition 2* (Department of Defence, 2023), 10.

⁶ Mike Benitez, "Anduril & General Atomics CCAs," *The Merge*, accessed September 18, 2024, <https://podcasters.spotify.com/pod/show/the--merge/episodes/E39--Anduril--General-Atomics-CCAs-e2lesms>.

operational environments'.⁷ However, CCAs also conform to the definition of uncrewed combat air vehicles (UCAV), defined as 'an unmanned military aircraft of any size which carries and launches a weapon, or which can use on-board technology to direct such a weapon to a target'.⁸ So, it follows that CCAs are UCAVs, designed to incorporate high levels of autonomy to carry and launch or support the launch of weapons to execute air combat missions.

WHY USE CCAS TO COUNTER THE CRUISE MISSILE THREAT?

The ADF requires credible defences to avoid being subject to military coercion or attack. China has multiple long-range strike systems capable of engaging targets within the Australian mainland. Historically, Australia's geography has provided significant advantages in terms of isolation and a large moat or 'air-sea gap' that has been central in strategies to defend continental Australia. However, the air-sea gap is no longer enough to ensure the Australian continent remains free from attacks as regional capabilities advance further into the missile age. In support of this assessment, Hellyer argues that fighter aircraft with a 1000 km combat radius may have been sufficient to defend the 'air-sea gap' in the 1980s but Australia's potential adversary now has capabilities that can strike from 3000 km away.⁹ More concerningly, the United States (US) Defence Intelligence Agency assesses that China possesses systems capable of attacking 5500 km from their mainland which encapsulates a large portion of northern Australia, as depicted in Figure 1.¹⁰ As China has pursued military parity with the US, the PLA has built a force that includes a low-cost missile force comprised of ballistic and cruise missiles, 'explicitly designed to keep the US and allied forces at arm's reach'.¹¹ Further, China has closely studied US force structure and operational posture and developed plans to counter the US and its allies across the Indo-Pacific. This could see China seeking to degrade US and allied sortie generation by striking theatre airbases and ground support capabilities such as those hosting US bomber forces in northern Australia.¹²

⁷ Caitlin Lee and Col Mark A Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike" (The Mitchell Institute for Aerospace Studies, December 2022), 3, <https://mitchellaerospacepower.org/wp-content/uploads/2022/12/The-Next-Frontier-UAVs-for-Great-Power-Conflict-FINAL.pdf>.

⁸ Colin Wills, *Unmanned Combat Air Systems in Future Warfare: Gaining Control of the Air* (Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2015), 2.

⁹ Hellyer, "Impactful Projection."

¹⁰ United States Department of Defense, "Military and Security Development Involving the People's Republic of China 2023 - Annual Report to Congress," 69, accessed September 17, 2024, <https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>.

¹¹ David A. Ochmanek, *Determining the Military Capabilities Most Needed to Counter China and Russia: A Strategy-Driven Approach* (Santa Monica, CA: RAND Corporation, 2022), 6, <https://doi.org/10.7249/PEA1984-1>.

¹² Col Mark A. Gunzinger, Maj Gen Lawrence A. Stutzriem, and Bill Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare" (The Mitchell Institute for Aerospace Studies, February 2024), 15, <https://mitchellaerospacepower.org/wp-content/uploads/2024/02/The-Need-For-CCAs-for-Disruptive-Air-Warfare-FULL-FINAL.pdf>.

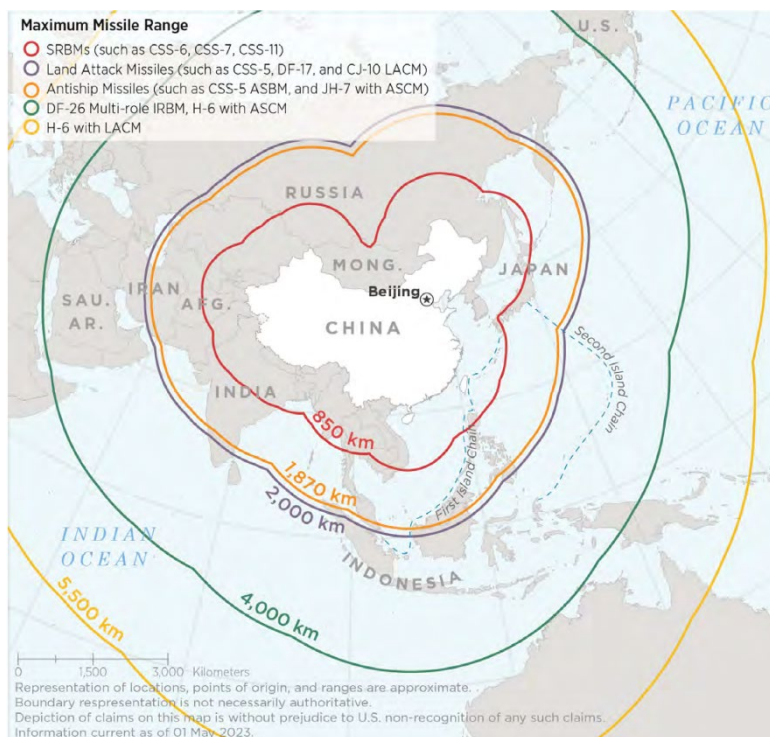


Figure 1: PLA Fielded conventional strike capabilities (United States Department of Defense 2023, 69)

Of the missiles that threaten Australia, defence against ballistic missiles requires attributes not readily incorporated by CCAs with dedicated integrated air and missile defence systems best suited to this task. Ballistic missile flight is doctrinally divided into three phases: boost, midcourse and terminal.¹³ Ballistic missile defence systems are designed to counter ballistic missiles in each phase of flight. The boost phase occurs from the point of launch until booster burnout and defence in this stage requires assets to be near the launch site. For missiles launched from mainland China and capable of striking Australia, the boost phase would occur at least 4000 km away. While boost phase counters are being developed for launch from F-35, a boost phase counter would require penetration of China's formidable anti-access area denial system.¹⁴ Such penetration is not viable for Australia, given the forward posture necessary to engage a missile in the boost phase. The midcourse phase occurs beyond the earth's atmosphere and is, therefore, beyond the physical capabilities of air-breathing systems such as CCAs. Midcourse defence is typically a task for rocket-powered interceptors such as the SM-3

¹³ United States Department of Defense, "The Ballistic Missile Defense System" (United States Department of Defense), accessed October 2, 2024, <https://www.defense.gov/Portals/1/Interactive/2018/11-2019-Missile-Defense-Review/MDR-BMDS-Factsheet-UPDATED.pdf>.

¹⁴ United States Department of Defense, "The 2019 Missile Defense Review - Executive Summary" (Office of the Secretary of Defense), XIII, accessed October 2, 2024, https://www.defense.gov/Portals/1/Interactive/2018/11-2019-Missile-Defense-Review/The%202019%20MDR_Executive%20Summary.pdf.

missile.¹⁵ Finally, the terminal phase commences when the ballistic missile re-enters the atmosphere, which results in a narrow window of opportunity to counter the missile. Terminal phase defence systems are typically exquisitely expensive because of the advanced technologies and precision required to intercept and destroy a small and high-speed target. While Australia does possess limited terminal phase capability with the Air Warfare Destroyer and intercept missiles such as SM-2 and SM-6, further analysis of ballistic missile defence is beyond the scope of this paper.¹⁶ Given the challenges ballistic missile defence poses to airbreathing aircraft such as CCAs, this leaves cruise missiles as the potent and long-range threat that CCA employment can be focussed on.

CCAs provide a means to extend the range and lethality of Australia's air combat capability to interdict long-range bombers before missile launch. China's land attack cruise missiles lack the range to attack Australia from Chinese territory and require forward projection by long-range bombers. From the air, China possesses a large fleet of H-6K bombers that are capable of carrying six land attack cruise missiles, which creates a system capable of attacking airfields in the second island chain from mainland China which includes large parts of Australia, as depicted in Figure 1.¹⁷ According to Janes, the H-6 has been displayed armed with two CJ-10K/KD-20 and two KD-63 cruise missiles with the CJ-10K having a reported range of 1,500+ km.¹⁸ Interdicting an H-6 before a missile launch would require a counter-air package to fly more than 1500 km, which exceeds the unrefuelled combat radius of Australia's crewed fighters.¹⁹ Given the criticality and limited size of Australia's air-to-air refuelling capability, CCAs could satisfy this range requirement without placing additional burden on the air-to-air refuelling capability. Supporting the notion that CCAs could be used to establish a potent counter-air capability, the Mitchell Institute CCA wargame concluded that CCAs could complement and enhance crewed fighters in the counter-air role, which could include interdiction of H-6 strike packages.²⁰

CCAs can embody the range, lethality and survivability to hold adversary surface action groups (SAG) at risk. The US Department of Defense anticipates, 'in the near-term, the PLAN will have the ability to conduct long-range precision strikes against land targets from its submarine and surface combatants using land-attack cruise missiles, notably enhancing the PRC's power projection capability'.²¹ From the sea, China possesses anti-ship cruise missiles that include land-attack variants. Notably, the YJ-18 series of cruise

¹⁵ Centre for Strategic and International Studies, "Standard Missile-3 (SM-3)," Missile Threat, accessed October 5, 2024, <https://missilethreat.csis.org/defsys/sm-3/>.

¹⁶ Euan Graham, "Royal Australian Navy Tests the Swiss Army Knife of Missiles," The Strategist, August 20, 2024, <https://www.aspistrategist.org.au/royal-australian-navy-tests-the-swiss-army-knife-of-missiles/>.

¹⁷ United States Department of Defense, "Military and Security Development Involving the People's Republic of China 2023 - Annual Report to Congress," 63.

¹⁸ Janes, "CJ-20 (K/AKD-20,CJ-10K/KD-20)," in *Weapons: Air Launched* (Janes, 2023), <https://customer.janes.com/display/JALWA092-JALW>; Andreas Rupprecht and Dominguez, Gabriel, "PLAAF'S New H-6N Bomber Seen Carrying Large Missile," *Defence Weekly*, October 19, 2020, https://customer.janes.com/Janes/Display/FG_3772109-JDW.

¹⁹ Commonwealth of Australia, "F-35A Lightning II" (Air Force, November 8, 2023), <https://www.airforce.gov.au/aircraft/f-35a-lightning-ii>; Commonwealth of Australia, "F/A-18F Super Hornet" (Air Force, February 17, 2023), <https://www.airforce.gov.au/aircraft/18f-super-hornet>.

²⁰ Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 23–30.

²¹ United States Department of Defense, "Military and Security Development Involving the People's Republic of China 2023 - Annual Report to Congress," 52.

missiles have been integrated for use on the Renhai-class cruiser and Luyang-III class destroyer with an estimated range of 220-540 km.²² The Mitchell Institute assess that Chinese SAGs will mitigate their physics-limited radar horizon by integrating KJ-500 Airborne Warning and Control aircraft to detect threats to the SAG. This increased radar coverage would support the use of their HHQ-9 surface-to-air missile out to the maximum range of 250 km, thus complicating attempts to directly engage the SAG as it is effectively a floating integrated air defence system.²³ Successfully striking such a well-defended SAG would require the use of attacking aircraft with sufficient survivability to penetrate the HHQ-9 missile engagement zone or the use of exquisite standoff weapons.

CCAs provide a means to complement Australia's crewed fighters to effectively counter China's potent cruise missile capabilities. Whether from the air or the sea, China possesses credible systems capable of projecting force upon Australia. However, autonomous and attritable systems like CCAs could form the basis of an operational approach to counter these threats. The counter should focus towards attacking the launch platforms, denying missile launches to efficiently and effectively defend against cruise missiles, i.e. attacking the archer and not the arrow. Long-range CCAs with sensing and offensive weapons could be used to hold Chinese bombers and surface ships at risk, denying them options to conduct long-range strikes on Australia. The Mitchell Institute has conducted several studies and wargames investigating the roles and types of CCAs that would be of greatest utility in countering China's forces. In the 2022 study on penetrating strike capabilities, one of the priority vignettes was a maritime strike against a Chinese surface action group, concluding that CCAs have great potential in this role.²⁴ These studies and wargames demonstrate that CCAs significantly enhance the survivability and lethality of crewed fighters and will be central to countering China's offensive capabilities.

HOW CAN COLLABORATIVE COMBAT AIRCRAFT BEST COUNTER THE CRUISE MISSILE THREAT?

Australia can counter the cruise missile threat by exploiting the unique attributes of CCAs to establish a long-range deterrent that can hold adversary launch platforms at risk. The primary difference between a crewed aircraft and a CCA is the removal of the human pilot from the aircraft and replacement with an advanced autonomy system, thus providing design and operational employment opportunities not available with crewed aircraft. Removing the pilot allows the platform to be intentionally lost to attrition or even operated as an expendable asset for high-risk missions. Adopting CCAs can also alleviate the ethical concerns associated with sending humans into highly contested environments. Removing humans then allows CCAs to be designed for shorter service life than crewed platforms, which can bring efficiencies and cost reductions, both in design and operations. Further, not having a pilot onboard also means the weight associated with cockpits and other human life-support systems can be used to enhance aspects of the design that contribute to mission effectiveness, such as increased range or payload capacity. Lastly, the removal of human crew allows retention of higher risk during development and flight test phases that can result in reduced program costs and increased speed of introduction to service.

²² "YJ-18," Missile Threat, accessed September 17, 2024, <https://missilethreat.csis.org/missile/yj-18/>.

²³ Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 29.

²⁴ Lee and Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike," 10.

Affordable attrition

Australia should adopt CCAs capable of penetrating the missile engagement zones of adversary surface action groups and bomber strike packages to hold them at risk. CCAs can be designed to have 'enough range and survivability to ensure they will reach their weapon launch points'.²⁵ The RAF has characterised the spectrum of survivability for CCAs by breaking it into three tiers. Tier one platforms are expendable with a life-cycle of one or very few missions, tier two platforms are attritable, expected to survive the mission, but losses are acceptable, and tier 3 are survivable where the platforms are of high strategic value, and the loss would impact combat effectiveness.²⁶ By designing CCAs to be attritable systems, they can deliver less sophisticated weapons closer to a target or mitigate situations where the adversary possesses a missile range overmatch, which affords them a tactical sanctuary with a first shot advantage. The US Air Force has closely studied these trade-offs in survivability, weapon cost and sophistication when comparing penetrating systems versus standoff systems. Their studies concluded that sufficiently survivable penetrating systems are more cost-effective in long conflicts as the cost of exquisite weapons can quickly outweigh platform costs.²⁷ By adopting a CCA that is sufficiently survivable to penetrate adversary defences at a cost point considered attritable, Australia can affordably increase the strategic depth of the air combat capability and enhance the deterrence effect it provides.

Australia should embrace CCAs that can be affordably designed to optimise their characteristics for denying cruise missile launch platforms. Aircraft can be designed with high levels of survivability against specified threats, with the survivability coming from a variety of technologies, including low observability and self-protection measures such as flares, decoys and electronic attack systems. The team of experts assembled for the Mitchell Institutes 2024 CCA wargame advocated for the development of a CCA fleet that balances unit cost against attributes such as 'size, low observability, range, [and] mission systems'.²⁸ Survivability can be a significant cost driver for aircraft but is required to mitigate the risk to human life for crewed platforms and the risk to platform loss. However, CCAs present options to deliberately design systems with just enough survivability to complete the mission, which can be accompanied by a willingness to accept attrition of the platform as the price of mission success. Conversely, the ever-present temptation to increase the capability by adding design features above the minimum required to complete the mission must be resisted to ensure the cost advantage of CCAs is not diminished. Exploiting these design dimensions presents Australia with ways to utilise CCAs to hold adversary long-range strike systems at risk.

Adopting CCAs allows operational commanders to decouple the risk to force and the risk to the mission, which can reduce barriers to counter-attacking highly defended targets, thus increasing the credibility of deterrence. Traditionally, operational employment of

²⁵ Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 7.

²⁶ United Kingdom Ministry of Defence, "Royal Air Force Autonomous Collaborative Platform Strategy" (Ministry of Defence, 27 Mar 24), 5, https://assets.publishing.service.gov.uk/media/66019fa8f1d3a0666832acfc/RAF_Autonomous_Collaborative_Platform_Strategy.pdf.

²⁷ Marcus Hellyer and Andrew Nicholls, "'Impactful Projection': Long-Range Strike Options for Australia" (Australian Strategic Policy Institute, December 2022), 38–42, https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2022-12/Impactful%20projection.pdf?VersionId=cvFyjDys7.R5_ZSjRURXZDgSgqpilQ9e.

²⁸ Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 6.

crewed aircraft in contested environments presented commanders with a high risk to force, i.e. loss of human life and high risk to mission, i.e. mission failure due to not delivering weapons and achieving the intended military effect.²⁹ By removing humans from the aircraft, these two risks can be considered separately, which opens up new opportunities, but it also presents potentially new ethical dilemmas. If the risk to human life can be affordably reduced through the use of CCAs for high-risk missions, then the dilemma arises as to whether it remains ethical to expose humans to this risk if there are alternate options.³⁰ Given the societal aversion to combat casualties in Western nations, an adversary could seek to exploit this to coerce through the threat of force. By designing CCAs to be attritable, commanders can accept high risk to the mission while mitigating risk to force, which in turn increases the credibility of the deterrence effect Australia's military is intended to create.

Exploiting CCA attributes to bolster deterrence

Australia can adopt CCAs to complement the existing crewed fighter capability and enhance the overall resilience of the air combat capability, but it will require new approaches. CCAs afford new opportunities by creatively exploiting their unique system attributes. However, this will require a departure from traditional crewed aircraft thinking and processes. The Mitchell Institute identified that exploiting these opportunities will require the adopting Air Force to 'aggressively pursue novel, and in some cases, untested approaches to UAV engineering, production, operations, and sustainment'.³¹ As an example, while CCAs can be designed to conduct specific air combat missions, an overarching aspect of the US Air Force approach is to distribute mission functions across a family of systems to 'amplify combat effectiveness'.³² Distributing capabilities across CCAs rather than concentrating them on a small number of exquisite platforms increases the resilience of the force and presents the adversary with a far more complex defensive dilemma.³³ This approach allows for designs to be optimised, which can enhance performance while reducing costs associated with 'jack-of-all-trade' aircraft like the F-35, which Allen et al. argue is costly, complicated and unwieldy.³⁴

The opportunity to adopt novel approaches to technical airworthiness risk must be exploited to field CCAs in a strategically relevant time frame to mitigate a shortfall in deterrence credibility until nuclear-powered submarines arrive. The removal of humans affords opportunities for new approaches to technical risk, which can reduce development times and enhance capability outcomes. A prime example is partitioning air vehicle control software from mission autonomy software to avoid costly regression testing during upgrades. Air vehicle control software will still be subject to military airworthiness certification to achieve an agreed level of safety, which is time consuming and resource-intensive, as are changes to systems with an extant certification. To exploit the potential of CCA mission autonomy and expedite software development, an alternate

²⁹ Vincent Aiello and Mike Benitez, "The Perfect Wingman," Fighter Pilot Podcast, accessed September 18, 2024, <https://podcasts.apple.com/au/podcast/fighter-pilot-podcast/id1330534712?i=1000648776430>.

³⁰ Lee and Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike," 15.

³¹ Lee and Gunzinger, 8.

³² Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 1.

³³ Lee and Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike," 16.

³⁴ Gregory C Allen and Isaac Goldston, "The Department Of Defense's Collaborative Combat Aircraft Program," August 2024, 2.

approach must be taken to enable rapid software development and fielding that is not subjected to conventional airworthiness processes.³⁵ The USAF appears to be harnessing this opportunity by running separate air vehicle and autonomy software competitions for the first tranche of CCA.³⁶ Australia should take this approach to CCA development and adopt US autonomy software architecture as an example of the technical integration sought by Concept APEX.³⁷ This would allow US-developed autonomy software to be incorporated into Australian-designed and manufactured air vehicles, thus assuring sovereign air vehicle supply while benefiting from US software development expertise, interoperability and economy of scale.

Fully exploiting the capability advantage of CCAs requires the ability to rapidly field enhancements in technology, which requires revised approaches to flight testing. Testing consumes significant time during the aircraft development phase, and the use of traditional crewed aircraft approaches will hinder the ability to rapidly deploy CCAs in operationally relevant time frames.³⁸ Accepting higher risks during flight testing to accelerate the development and introduction to service is critical, given the reduction in strategic warning time. This is particularly relevant for testing mission autonomy software. Instead of applying crewed aircraft standards, the approach that separates air vehicle control from mission autonomy should be used.

Logistics and basing considerations for enhanced deterrence

CCAs would have a stronger deterrent effect if positioned at various locations across northern Australia to defend against cruise missile launch platforms more effectively. Two important considerations for Australia's adoption of CCAs are basing and force protection. Given the advantages of CCAs in combat, it is reasonable to expect they would be targeted in enemy attacks. Mitchell Institute wargames identified that protecting CCAs from attack and providing adequate supply across dispersed operating locations to maintain sortie generation are unsolved concerns.³⁹ These issues should be prioritised for analysis and assessment as Australia develops and refines CCA operating concepts. Distributing CCAs across a network of bases, such as Australia's northern bases, could complicate the adversary's ability to 'find, fix, and attack' the capability on the ground where they are most vulnerable.⁴⁰ This dispersal could raise the costs of an adversary attack, thus contributing to the deterrent effect.

Australia can best use CCAs to enhance the range of lethal force projection without placing additional demand on already over-subscribed air-to-air refuelling capacity. Australia has a relatively small fleet of air-to-air refuelling aircraft, and the recent Integrated Investment Program did not allocate funds to procuring additional tankers.⁴¹ Given the existing criticality of tankers for the operation of crewed aircraft, CCAs must

³⁵ Allen and Goldston, 9.

³⁶ Benitez, "Anduril & General Atomics CCAs."

³⁷ Commonwealth of Australia, "APEX: Australian Defence Force Capstone Concept - Integrated Campaigning for Deterrence, Edition 2" (Department of Defence, January 11, 2024), 22.

³⁸ Lee and Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike," 24.

³⁹ Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 33.

⁴⁰ Gunzinger, Stutzriem, and Sweetman, 7.

⁴¹ Hellyer and Nicholls, "Impactful Projection': Long-Range Strike Options for Australia," 15; Commonwealth of Australia, "Integrated Investment Program" (Department of Defence, April 17, 2024), <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

possess sufficient unrefuelled combat radius to hold cruise missile launch platforms at risk beyond their missile launch point. Fielding CCAs, which require air-to-air refuelling to deliver operationally meaningful force projection from Australian bases, would degrade rather than enhance air combat capability. The weight reduction afforded by removing cockpits and associated systems from CCA designs should be prioritised towards increasing range and combat radius so they can mitigate the range limitations of Australia's crewed fighters and the dependency on air-to-air refuelling.

SOVEREIGN CAPABILITY ENHANCES DETERRENCE CREDIBILITY

A sovereign capability to manufacture CCAs enhances self-sufficiency and reduces the risk of being unable to replenish aircraft from allies during conflicts. Developing attritable capabilities requires consideration of the underpinning logistics approach to ensure an appropriate cost-to-risk ratio for their use and a means of replenishing operational units when aircraft are damaged. The UK Ministry of Defence acknowledges this consideration in their Autonomous Collaborative Platform Strategy, accepting that aircraft may be lost when operated in hostile environments. The UK strategy states CCAs 'should be acquired with an expectation that stocks may need to be rapidly replenished and capabilities re-evaluated once use begins'.⁴² This need can be met by slowly manufacturing CCAs during peacetime and stockpiling them for use, as is currently done with Australia's guided weapons or alternately having access to a manufacturing capability (sovereign or allied) with scalable capacity to replace damaged aircraft during conflict. However, it must be noted that any conflict in which Australia commits CCAs to missions with a high risk of attrition is likely to also involve the US. Therefore, it is reasonable to expect that US production capacity will be prioritised towards meeting US needs, as was Australia's experience in WWII. The USAF is preparing for a conflict that is likely to see high levels of attrition, not seen since WWII, and their senior leaders acknowledge that developing the industrial capacity to meet that demand will be challenging, given contemporary budget pressures.⁴³ Therefore, Australia must be self-sufficient in terms of replenishing CCAs lost to attrition, which requires a sovereign manufacturing capability.

Australia must establish a viable means of replenishing damaged CCAs to ensure the deterrence effect they generate is credible. The RAF recognise that CCAs 'must be affordable and of regenerative mass to present a credible force capable of continued operations despite attrition'.⁴⁴ While stockpiling is a viable source of replenishment, it has two key drawbacks, the first is that a stockpile is finite and expensive to establish, and a determined adversary could simply seek to exhaust a nation's stockpile in a war of economic attrition. Secondly, stockpiling implies that aircraft would require a fixed hardware configuration that would lose its competitive advantage over time and inhibit exploitation of advances in manufacturing, computing and sensing technologies. The alternative to stockpiling is to invest in scalable manufacturing capacity that operates at a minimum viable level during peacetime with provisions to dramatically expand

⁴² United Kingdom Ministry of Defence, "Royal Air Force Autonomous Collaborative Platform Strategy," 9.

⁴³ Charles Pope, "CSAF Outlines Strategic Approach for Air Force Success," Air Force, August 31, 2020, <https://www.af.mil/News/Article-Display/Article/2331282/csaf-outlines-strategic-approach-for-air-force-success/https%3A%2F%2Fwww.af.mil%2FNews%2FArticle-Display%2FArticle%2F2331282%2Fcsaf-outlines-strategic-approach-for-air-force-success%2F>.

⁴⁴ United Kingdom Ministry of Defence, "Royal Air Force Autonomous Collaborative Platform Strategy," 4.

manufacturing in conflict.⁴⁵ A scalable CCA production capability with the capacity to surge in wartime to support tolerance for operational attrition that allows the full exploitation of attritional or expendable systems.⁴⁶ However, the operational attrition of CCAs must be balanced against the capacity to replenish operational units as high attrition may be viable in a short conflict but become intolerably expensive in a long conflict.⁴⁷ Investing in a scalable CCA manufacturing capability is the most suitable means of ensuring the risk of platform attrition is operationally tolerable.

Affordable mass and cost asymmetry

CCAs provide Australia with a means of obtaining affordable mass to create asymmetric cost imposition that is not viable using crewed platforms. CCAs provide the opportunity to establish asymmetric cost imposition on an adversary, raising the costs above the benefits of aggression. At a time when a large portion of the Australian Defence Force capability budget has been assigned to maritime capabilities, most notably the nuclear-powered submarine program under AUKUS pillar one, CCAs provide an opportunity for Australia to substantially increase the lethality of the air combat program. Given the expense of crewed aircraft and challenges associated with recruiting, training and retaining aircrew, CCAs 'could help offset serious force structure shortfalls'.⁴⁸ For Australia to successfully deter a much more powerful adversary, credible and affordable capabilities are required to shift the 'cost exchange ratio' in favour of Australia.⁴⁹ USAF Lt General Steven Kwast summed up the cost imposition discussion by asserting, 'when there's a \$10 problem, ... you [try to] solve that problem for 10 cents and you force your competition to solve it for a thousand bucks'.⁵⁰ Using several CCAs to destroy a formation of bombers or a guided missile destroyer is exactly the cost asymmetry Australia requires for effective deterrence by denial.

CCAs provide a pathway to establish combat mass at an affordable price point compared to crewed aircraft. The removal of humans relieves the designers of the 'engineering and cost disadvantages of accommodating flesh-and-bone pilots who need life support, flight controls, displays, and escape systems'.⁵¹ The reduced price of CCAs will come from the adoption of new manufacturing technologies and opportunities arising from removing human crew, which includes paired back design standards and reduced service life. CCAs can be designed for significantly lower service life and flight cycles, which are significant cost drivers for crewed aircraft.⁵² US Air Force research indicates that CCAs may be procured for \$1200 USD per pound as compared to crewed fighters, which cost \$4000-\$6000 USD per pound (20-30 percent of crewed aircraft cost).⁵³ In contrast, the Australian Government has publicly stated that the target cost of the MQ-28A Ghost Bat

⁴⁵ Andrew Dowse et al., *Australia's Sovereign Capability in Military Weapons* (Santa Monica, CA: RAND Corporation, 2023), 8, <https://doi.org/10.7249/PEA2131-1>.

⁴⁶ Lee and Gunzinger, "The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike," 4.

⁴⁷ Lee and Gunzinger, 27.

⁴⁸ Lee and Gunzinger, 10.

⁴⁹ Lee and Gunzinger, 11.

⁵⁰ Jennifer Hlad, "Imposing Costs on the Enemy," *Air & Space Forces Magazine*, May 30, 2017, <https://www.airandspaceforces.com/article/imposing-costs-on-the-enemy/>.

⁵¹ Allen and Goldston, "The Department Of Defense's Collaborative Combat Aircraft Program," 2.

⁵² Gunzinger, Stutzriem, and Sweetman, "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare," 23.

⁵³ John Tirpak, "Experts: CCA Drones Could Cost Less Than \$1,200 per Pound," *Air & Space Forces Magazine*, September 27, 2024, <https://www.airandspaceforces.com/experts-cca-drones-cost-use-maintenance/>.

CCA is around 10 per cent of a crewed fighter.⁵⁴ However, at Senate Estimates on 14 February 2024, AVM Graham Edwards declared that Defence was procuring eight Block 1 Ghost Bats and three Block 2 variants for a total cost of \$1 billion, with a capability demonstration scheduled to commence in 2025.⁵⁵ 11 aircraft for \$1 billion is hardly affordable mass, but this cost data is better interpreted as the cost associated with re-establishing a sovereign aircraft design and manufacturing capability. As more countries progress their CCA programs into production, clearer cost data will become available, but requirements creep, and the desire to build multirole, exquisite CCAs versus focussed and affordable CCAs must be resisted to ensure affordable mass remains achievable.

CONCLUSION

In conclusion, Australia requires a suite of capabilities that can integrate to generate a credible deterrent effect by raising the cost for an adversary to project military force against Australia. These capabilities must possess enough lethality to influence an adversary's decision, so they conclude that the benefits of attacking Australia do not outweigh the costs. If deterrence fails, these capabilities must be proven and credible to shift from deterrence to response in defence of Australia. In the missile age, Australia's geographic remoteness and the much-lauded 'air-sea gap' no longer provide a sanctuary from attack. Regionally, China possesses an extensive array of ballistic and cruise missiles that constitute a viable means of striking Australia, using systems that originate in mainland China. Given that defence against ballistic missiles presents significant challenges to air-breathing aircraft, Australia's air combat capability must focus on the threat posed by cruise missiles. Augmenting Australia's crewed fighters with CCAs provides an affordable means to enhance range, lethality and survivability. Using CCAs with the right attributes, CCAs can be used to hold cruise missile launch platforms at risk. Further, CCAs offer Australia a way to swiftly enhance its military deterrence, especially in contrast to long-gestation programs like the nuclear-powered submarine, which will not bolster deterrence until the 2030s.

CCAs possess unique attributes which afford adopting Air Forces opportunities to create lethal systems capable of shifting the cost exchange ratio in their favour. The versatility, autonomy, and affordability of CCAs provide the ADF with a valuable tool for enhancing long-range strike capabilities and countering threats from technologically advanced adversaries. Moreover, CCAs have the potential to impose significant operational costs on aggressors while reducing the risk to human life, which supports Australia's broader deterrence strategy. Given that CCAs can be most effective if considered attritable when being used to penetrate adversary defences, a credible CCA capability must be accompanied by a means of replenishing destroyed aircraft. In the case of Australia, developing a sovereign capability for design and manufacturing that can operate at a minimum viable capacity during peacetime and scale up production for war will be a costly but strategically valuable investment. Overall, CCAs not only enhance Australia's military resilience but also contribute to a broader, more cost-effective defence posture in the face of evolving regional challenges.

⁵⁴ "Radio Interview, ABC" (Defence Ministers, February 9, 2024), <https://www.minister.defence.gov.au/transcripts/2024-02-09/radio-interview-abc>.

⁵⁵ Commonwealth, Parliamentary Debates, Senate, AVM Graham Edwards, 2024, https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/27711/toc_pdf/Foreign%20Affairs,%20Defence%20and%20Trade%20Legislation%20Committee_2024_02_14_Official.pdf;fileType=application%2Fpdf.

References

Aiello, Vincent, and Mike Benitez. "The Perfect Wingman." Fighter Pilot Podcast. Accessed September 18, 2024. <https://podcasts.apple.com/au/podcast/fighter-pilot-podcast/id1330534712?i=1000648776430>.

Allen, Gregory C, and Isaac Goldston. "The Department Of Defense's Collaborative Combat Aircraft Program," August 2024.

Benitez, Mike. "Anduril & General Atomics CCAs." The Merge. Accessed September 18, 2024. <https://podcasters.spotify.com/pod/show/the--merge/episodes/E39--Anduril--General-Atomics-CCAs-e2lesms>.

Centre for Strategic and International Studies. "Standard Missile-3 (SM-3)." Missile Threat. Accessed October 5, 2024. <https://missilethreat.csis.org/defsyst/sm-3/>.

Commonwealth of Australia. *ADF Concept ASPIRE - The Australian Defence Force's Theatre Concept, Edition 2*. Department of Defence, 2023.

———. "APEX: Australian Defence Force Capstone Concept - Integrated Campaigning for Deterrence, Edition 2." Department of Defence, January 11, 2024.

———. "F-35A Lightning II." Air Force, November 8, 2023. <https://www.airforce.gov.au/aircraft/f-35a-lightning-ii>.

———. "F/A-18F Super Hornet." Air Force, February 17, 2023. <https://www.airforce.gov.au/aircraft/18f-super-hornet>.

———. "Integrated Investment Program." Department of Defence, April 17, 2024. <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

———. "National Defence: Defence Strategic Review 2023 | About | Defence." Commonwealth of Australia, Department of Defence. Accessed February 17, 2024. <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>.

———. "National Defence Strategy." Department of Defence, April 2024.

Commonwealth, Parliamentary Debates, Senate, AVM Graham Edwards, 2024. https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/27711/toc_pdf/Foreign%20Affairs,%20Defence%20and%20Trade%20Legislation%20Committee_2024_02_14_Official.pdf;fileType=application%2Fpdf.

Dowse, Andrew, Marigold Black, John P. Godges, Caleb Lucas, and Christopher A. Mouton. *Australia's Sovereign Capability in Military Weapons*. Santa Monica, CA: RAND Corporation, 2023. <https://doi.org/10.7249/PEA2131-1>.

Graham, Euan. "Royal Australian Navy Tests the Swiss Army Knife of Missiles." The Strategist, August 20, 2024. <https://www.aspistrategist.org.au/royal-australian-navy-tests-the-swiss-army-knife-of-missiles/>.

Gunzinger, Col Mark A., Maj Gen Lawrence A. Stutzriem, and Bill Sweetman. "The Need for Collaborative Combat Aircraft for Disruptive Air Warfare." The Mitchell Institute for Aerospace Studies, February 2024. <https://mitchellaerospacepower.org/wp->

content/uploads/2024/02/The-Need-For-CCAs-for-Disruptive-Air-Warfare-FULL-FINAL.pdf.

Hellyer, Marcus. “‘Impactful Projection’: A Porcupine with Very Long Quills.” *The Strategist*, November 18, 2022. <https://www.aspistrategist.org.au/impactful-projection-a-porcupine-with-very-long-quills/>.

Hellyer, Marcus, and Andrew Nicholls. “‘Impactful Projection’: Long-Range Strike Options for Australia.” Australian Strategic Policy Institute, December 2022. https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2022-12/Impactful%20projection.pdf?VersionId=cvFyjDys7.R5_ZSjRURXZDgSgqpilQ9e.

Hlad, Jennifer. “Imposing Costs on the Enemy.” *Air & Space Forces Magazine*, May 30, 2017. <https://www.airandspaceforces.com/article/imposing-costs-on-the-enemy/>.

Janes. “CJ-20 (K/AKD-20,CJ-10K/KD-20).” In *Weapons: Air Launched*. Janes, 2023. <https://customer.janes.com/display/JALWA092-JALW>.

Lee, Caitlin, and Col Mark A Gunzinger. “The Next Frontier: UAVs for Great Power Conflict - Part 1: Penetrating Strike.” The Mitchell Institute for Aerospace Studies, December 2022. <https://mitchellaerospacepower.org/wp-content/uploads/2022/12/The-Next-Frontier-UAVs-for-Great-Power-Conflict-FINAL.pdf>.

Missile Threat. “YJ-18.” Accessed September 17, 2024. <https://missilethreat.csis.org/missile/yj-18/>.

Ochmanek, David A. *Determining the Military Capabilities Most Needed to Counter China and Russia: A Strategy-Driven Approach*. Santa Monica, CA: RAND Corporation, 2022. <https://doi.org/10.7249/PEA1984-1>.

Pope, Charles. “CSAF Outlines Strategic Approach for Air Force Success.” Air Force, August 31, 2020. <https://www.af.mil/News/Article-Display/Article/2331282/csaf-outlines-strategic-approach-for-air-force-success/https%3A%2F%2Fwww.af.mil%2FNews%2FArticle-Display%2FArticle%2F2331282%2Fcsaf-outlines-strategic-approach-for-air-force-success%2F>.

“Radio Interview, ABC.” Defence Ministers, February 9, 2024. <https://www.minister.defence.gov.au/transcripts/2024-02-09/radio-interview-abc>.

Rupprecht, Andreas, and Dominguez, Gabriel. “PLAAF’S New H-6N Bomber Seen Carrying Large Missile.” *Defence Weekly*, October 19, 2020. https://customer.janes.com/Janes/Display/FG_3772109-JDW.

Shoebridge, Michael. “As Defence’s Core Functions Fail, What’s the Plan for Change?” Strategic Analysis Australia, November 30, 2023. <https://strategicanalysis.org/as-defences-core-functions-fail-whats-the-plan-for-change/>.

Tirpak, John. “Experts: CCA Drones Could Cost Less Than \$1,200 per Pound.” *Air & Space Forces Magazine*, September 27, 2024. <https://www.airandspaceforces.com/experts-cca-drones-cost-use-maintenance/>.

United Kingdom Ministry of Defence. “Royal Air Force Autonomous Collaborative Platform Strategy.” Ministry of Defence, 27 Mar 24.

https://assets.publishing.service.gov.uk/media/66019fa8f1d3a0666832acfc/RAF_Autonomous_Collaborative_Platform_Strategy.pdf.

United States Department of Defense. "Military and Security Development Involving the People's Republic of China 2023 - Annual Report to Congress." Accessed September 17, 2024. <https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>.

———. "The 2019 Missile Defense Review - Executive Summary." Office of the Secretary of Defense. Accessed October 2, 2024.

https://www.defense.gov/Portals/1/Interactive/2018/11-2019-Missile-Defense-Review/The%202019%20MDR_Executive%20Summary.pdf.

———. "The Ballistic Missile Defense System." United States Department of Defense. Accessed October 2, 2024. <https://www.defense.gov/Portals/1/Interactive/2018/11-2019-Missile-Defense-Review/MDR-BMDS-Factsheet-UPDATED.pdf>.

Wills, Colin. *Unmanned Combat Air Systems in Future Warfare: Gaining Control of the Air*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2015.



Potential use of civilian airfields to improve resilience of air operations in Northern Australia

Squadron Leader Craig Reynolds

Squadron Leader Craig Reynolds is an Aeronautical Engineer and a graduate of the Australian Command and Staff Course (Military Art) class of 2024. He is currently posted to Air Force Headquarters where he works on capability requirements for the MQ-28A Ghostbat.

Introduction – Everyone has a plan until they get punched in the face

The aphorism that everyone has a plan until they get punched in the face appears to originate as misquote of the pugilist Mike Tyson's comment that, "everyone has a plan until they get hit for the first time".¹ Like Clausewitz observation that war is, "always the collision of two living forces", it is a reminder that the enemy always gets a vote.² However Tyson also provides an incisive reminder that combatants, whether boxers or military forces, need to be able to take a hit and stay in the fight. Stretching the boxing analogy a little further, air power can be likened to a boxer with long reach, a devastating punch and a glass jaw. In the air, aircraft are fast, agile and can deliver a devastating blow; a single fighter bomber can deliver a greater weight of ordnance onto a target simultaneously than an entire brigade of artillery. However, on the ground aircraft are fragile, immobile and utterly dependent on complex support systems. An adversary who can get inside the reach and deliver an effective blow against aircraft basing can achieve disproportionate results.

The Australian Government has recognised the importance of bases, including air bases. The *National Defence Strategy 2024* directs the delivery of, "a logistically networked and resilient set of bases, predominantly across the north of Australia, to enhance force projection and improve Defence's ability to recover from an attack".³ This direction has been supported by the allocation of approximately \$6bn in the *Integrated Investment Program 2024* for northern airbase infrastructure.⁴ However, the challenge confronting Defence is vast. The distance between RAAF Learmonth on the west coast of northern Australia and RAAF Townsville on the east coast of northern Australia is more than

¹ "Everybody Has Plans Until They Get Hit for the First Time," Quote Investigator, accessed October 13, 2024, <https://quoteinvestigator.com/2021/08/25/plans-hit/>

² Carl Von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton University Press, 1989), 77.

³ Department of Defence, *National Defence Strategy 2024* (Commonwealth of Australia, 2024), 29, <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

⁴ Department of Defence, *Integrated Investment Program 2024* (Commonwealth of Australia, 2024), 87, <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

3,400km, approximately the distance from London to Beirut.⁵ The Air Force has only six air bases within this area, including RAAF Learmonth and RAAF Townsville.⁶ With a tiny number of bases to cover a huge area, the ability of the Air Force to take the hit and stay in the fight is open to question.

Construction in northern Australia is an expensive undertaking. Building additional airbases in northern Australia to improve the resilience and survivability of air operations in northern Australia would put substantial pressure on an already stretched budget and involve significant opportunity costs. However, the concept of National Defence articulated in the *National Defence Strategy 2024* provides some guidance to an approach that could be taken to mitigate the problem. The *National Defence Strategy 2024* defines National Defence as, “a coordinated, whole-of-government and whole-of-nation approach to meet the strategic challenges Australia faces” that, “harnesses all arms of Australia’s national power”.⁷ Utilising suitable civilian airfields to support military air operations could potentially reduce the dependence of air operations on a handful of military air bases, reducing the vulnerability of the force to attacks on those bases and improving the resilience and survivability of air operations in northern Australia.

Research Question and Analytical Method

The research question that this paper aims to address is, what is the potential to utilise civilian airfields to improve the resilience and survivability of air operations in northern Australia? In assessing potential this paper seeks to investigate whether the use of civilian airfields for military air operations is a promising avenue for further investigation, as opposed to a detailed analysis of the feasibility of military air operations at particular airfields. This is necessary because this paper is limited to information available to the public, while a detailed analysis of feasibility would require access to classified information. For this paper, northern Australia is defined as the portion of mainland Australia north of latitude 26°S. This aligns with the southern border of the Northern Territory and approximately aligns with the definition used by the Commonwealth Government’s Office of Northern Australia.⁸ This definition is also used by the Australian Strategic Policy Institute for their series on security of northern Australia.⁹

This paper will start by reviewing some fundamental principles of operating, attacking and defending airbases. It will then examine the historical pattern of attacks against air power on the ground. This will be followed by an analysis of the contemporary environment, including the impact of technologies as well as current concepts and doctrine. Lessons and observation from the current conflict in Ukraine are particularly relevant as a major conflict where control of the air remains contested. Finally, this paper will examine airfield requirements for Royal Australian Air Force crewed fast jet, surveillance and tanker aircraft. These will be compared to available airfield infrastructure in northern Australia to draw conclusions about the potential to utilise civilian airfields for military purposes. This will form the basis of recommendations for future research and policy actions. This paper has excluded uncrewed, training and transport aircraft from

⁵ Distances measured using Google Earth App October 13, 2024.

⁶ “About Us: Bases,” Royal Australian Air Force, accessed October 13, 2024, <https://www.airforce.gov.au/about-us/bases>

⁷ Defence, *National Defence Strategy*, 17.

⁸ “Office of Northern Australia,” Department of Infrastructure, Transport, Regional Development, Communication and the Arts, accessed October 13, 2024, <https://www.infrastructure.gov.au/territories-regions-cities/regional-australia/office-northern-australia>

⁹ “ASPI Strategist: North of 26° South,” Australian Strategic Policy Institute, accessed October 13, 2024, <https://www.aspistrategist.org.au/dinkus/north-of-26-south/>

consideration to simplify analysis. Uncrewed aircraft have the potential to introduce additional airfield requirements that may not be available in the public domain. Training aircraft are generally not used directly in contested military operations, while transport aircraft form part of a broader transportation network that requires considerations such as access to land and sea transport terminals that are beyond the scope of this study.

An airfield site selection methodology for US Air Force agile combat employment developed by Moer, Chini, Feng and Schuldt was considered, but not used. This technique was developed for a theatre level overview in the context of US Indo-Pacific basing requirements in a war against China and lacked the detail other methods could provide in a northern Australia context.¹⁰ Instead, airfield suitability was assessed by comparing runway length and strength against aircraft requirements. Runway length and strength data was usually taken from Airservices Australia flight planning information published in the En Route Supplement Australia (ERSA).¹¹ The only exception to the use of ERSA data was for military airfields undergoing upgrade projects, in these cases the publicly declared capability of the airfield post upgrade was used. Aircraft runway requirements are dependent on aircraft type and weight, airfield attitude and atmospheric conditions. Requirements for fast jet airfields were based on the F-35A Lightning II, because any airfield capable of supporting the F-35A will also be able to support the F/A-18F Super Hornet and E/A-18G Growler.¹² Runway suitability was also assessed for the E-7A Wedgetail Airborne Early Warning and Control, P-8A Poseidon Maritime Patrol Aircraft and the KC-30A Multi-Role Tanker Transport. All analysis assumed aircraft operating at Maximum Take Off Weight (MTOW). Runway length requirements were based on hot conditions at airfields up to 2000ft above sea level. Runway strength requirements were based on the Aircraft Classification Number (ACN) / Pavement Classification Number (PCN) system where an aircraft with ACN lower than the runway PCN can operate without restriction on the runway.¹³

It should be noted that this approach is conservative and limits the selection of airfields to runways able to support the full capability of the aircraft at peacetime levels of risk to the aircraft and the runway. Decisions to accept operational limitations, higher rates of wear to the runway or higher levels of risk would enable a larger number of airfields to be utilised. However, in the absence of an actual situation driving decision making, many assumptions would be required, rendering the value of any such analysis dubious.

Fundamental Principles of Airbase Operation, Attack and Defence.

By convention, operating times in aviation are measured in hours. This gives an indication of the comparatively short endurance of aircraft and the fundamental importance of airbase operations on the ground to support military aviation operations. The most basic airbase can consist of a runway where the aircraft can land and take off, and an area with stores and limited ground crew where the aircraft can be replenished. This is commonly referred to as a Forward Arming and Refuelling Point (FARP). If aircraft

¹⁰ Zachary T. Moer et al. , “Contested Agile Combat Employment: A Site Selection Methodology,” *Air & Space Operations Review* 1, no.3 (2022): 70-71

<https://research.ebsco.com/c2jmkxr/viewer/pdf/datbfjupdn>

¹¹ Airservices Australia, *ERSA effective 21 Mar 2024* (Airservices Australia, 2024).

¹² There was no official information available on F/A-18F and E/A-18G airfield length requirements. However, both aircraft are designed to operate from aircraft carriers and all publicly available information indicated that they require a significantly shorter runway than the F-35A

¹³ Civil Aviation Safety Authority, *Advisory Circular AC 139.C-07v 1.0: Strength Rating of Aerodrome Pavements* (Civil Aviation Safety Authority, 2021), 22, <https://www.casa.gov.au/strength-rating-aerodrome-pavements>

are operating from an airbase for a period, the base will usually have crew briefing and planning facilities and at least limited maintenance capability, with communications and personnel support capabilities to support these activities. The largest airbases can resemble small cities, with thousands of personnel and heavy industrial maintenance, test and calibration facilities. The loss of different capabilities on an airbase will have different impacts on air operations. For example the loss of movement surfaces such as runways and taxiways may immediately prevent operations from that airbase temporarily, while loss of sophisticated calibration facilities may lead to a long-term degradation of aircraft availability.

The functions a force needs to perform to attack an airbase have remained consistent, while the tools available to execute the functions have been subject to considerable evolution. An effective attack on airbase requires both targeting information and a means of prosecuting the attack on the target. Effective targeting information allows effort to be focussed on valuable targets and can be gained through a range of means including espionage, ground-based reconnaissance, aerial reconnaissance, satellite observation and electronic intelligence. An attack can be prosecuted through sabotage, penetrating assault or stand-off attack. A stand-off attack can utilise weapons ranging from man-portable mortars, rockets or small drones through air attack to cruise and ballistic missiles.



Figure 2: Satellite photograph of RAAF Tindal, showing dispersed aircraft operational areas to the left of the image and consolidated aircraft operational areas to the right.¹⁴

¹⁴ Satellite view of RAAF Tindal, Google Maps, accessed October 13, 2024
https://www.google.com/maps/@-14.5271258,132.3950147,1711m/data=!3m1!1e3?entry=tту&g_ep=EgoyMDI0MTAwMi4xIKXMDSoASAFQAw%3D%3D

The consolidated operational area was introduced for the F-35A to facilitate security and operational efficiency.¹⁵

The design of an airbase for defence against attack is a compromise that requires consideration of factors including current and future threats to the airbase, redundancy, dispersal vs consolidation, hardening and opportunity cost. Meeting current threats and hedging against future threats is a key consideration because airbase infrastructure projects can take years to complete and be in service for decades. It is possible that the threat will change between when the project is conceived and when it is completed, and almost certain that the threat will change before the project is retired. Redundancy of critical infrastructure enables the airbase to continue to function if it is damaged or destroyed, but comes at considerable cost. As illustrated in Figure 2, dispersal on an airbase or between airbases makes it more difficult for an adversary to cause widespread destruction with a stand-off attack, while consolidation makes it easier to secure against espionage, sabotage and penetrating assault as well as improving operational efficiency. Hardening protects aircraft or critical infrastructure against attack and usually takes the form of revetments (Figure 3), hardened aircraft shelters (Figure 4), or occasionally underground hangars (Figure 5). Constructing defensive features for an airbase imposes significant opportunity cost because it requires considerable resources and funding that cannot be used for other purposes, with the risk that those resources and funds are wasted if conflict occurs in a different location.



Figure 3: RAAF Canberra bombers in revetments at Phan Rang, South Vietnam.¹⁶ Revetments provide protection from sides and rear, reducing damage from adjacent attacks.

¹⁵ Department of Defence, Facilities Requirements for the New Air Combat Capability: Statement of Evidence to the Parliamentary Committee on Standing Works (Commonwealth of Australia, 2014), 15, <https://www.aph.gov.au/DocumentStore.ashx?id=b2b1ed75-dc16-447a-a878-b8670edb674d&subId=254100>

¹⁶ Australian War Memorial, *Phan Rang, Vietnam. 1967-07. Aerial view of the aircraft revetments at the airbase, 1967*, Australian War Memorial, Accession no. P01978.002, <https://www.awm.gov.au/collection/C287384>



Figure 4: USAF F-22 in hardened aircraft shelter at Spangdahlem, Germany.¹⁷ Hardened aircraft shelters provide all round protection to the aircraft.



Figure 5: Entrance to an abandoned underground hangar in Croatia.¹⁸ Underground hangars provide extremely high levels of protection but require the right topography.

Historical Patterns of Airfield Attacks

Airpower arguably came of age during the Second World War, with battle to control the air and destroy adversaries' air forces being a key consideration for all major combatants. Following the fall of France, Hitler ordered, "the Luftwaffe to overpower the English air force with all the forces at its command, in the shortest time possible".¹⁹ To defend against this attack the RAF had an Integrated Air Defence System (IADS) with aircraft operating from a collection of major sector airfields and dispersed satellite airfields.²⁰ The Luftwaffe struggled to gain targeting information on RAF airfields, losing 50 aircraft on reconnaissance missions prior to the battle.²¹ The Luftwaffe proved unable to overwhelm the RAF IADS and network of dispersed bases, switching to attacks on London in the hope of victory through air to air combat before dwindling to defeat.²² In contrast to the massed air attack of the Luftwaffe, the British were able to achieve considerable

¹⁷ "Raptor pilots visit future generation," U.S. Air Forces in Europe, accessed October 13, 2024 <https://www.usafe.af.mil/News/Article-Display/Article/748112/raptor-pilots-visit-future-generation>

¹⁸ "The Underground Airbase That Could Launch Planes," 3 Seas Europe, accessed October 13, 2024, <https://3seaseurope.com/zeljjava-yugoslavia-underground-airbase-croatia/>

¹⁹ Douglas C. Dildy, *Battle of Britain 1940: The Luftwaffe's 'Eagle Attack'* (Osprey Publishing, 2018), 40.

²⁰ Dildy, *Battle of Britain*, 36.

²¹ Dildy, *Battle of Britain*, 42.

²² Dildy, *Battle of Britain*, 75.

destruction of German aircraft in North Africa with penetrating ground raids undertaken by special forces.²³

If the Battle of Britain was history's first large scale counter air campaign, the opening air strikes of the Six Day War were arguably the most spectacular. In less than 12 hours the Israelis flew almost 700 sorties with less than 200 aircraft, attacking 26 airfields and destroying more than 400 aircraft for the loss of only 24.²⁴ Arab aircraft were dispersed on airbases, but the only hardening was a limited number of revetments.²⁵ The Israeli's developed tactics that enabled them to disable the runway rendering the airbase inoperative then immediately attack aircraft stranded on the ground.²⁶ In the same era, the US in South Vietnam was contending with ground attacks that overwhelmingly used stand-off weapons to destroy more aircraft than air to air combat during that war.²⁷

The 1982 Falklands War saw two militaries with advanced air forces contest air control in a remote corner of the South Atlantic. Once again availability of airfields became a significant issue. The British devoted considerable resources to the 'Blackbuck' air raid from Ascension Island, which successfully cratered the only sealed runway on the islands at Stanley Airport, precluding any possibility of the airfield being used for fighter aircraft while creating difficulties for transport flights.²⁸ Prior to landing on the islands, the British conducted a penetrating special forces raid to destroy the light attack aircraft based at Pebble Island and remove the threat they posed to the landings.²⁹ Once ashore on the islands, the British took advantage of the unique Vertical / Short Take Off and Landing (V/STOL) capabilities of the Harrier aircraft to construct a FARP at San Carlos, extending the range and endurance of the carrier based aircraft (Figure 6).³⁰



Figure 6: Temporary Forward Arming and Refuelling Point (FARP) constructed at San Carlos during the Falklands War.³¹

²³ Paul Collier et al., *The Second World War: A World in Flames* (Osprey Publishing, 2004), 181.

²⁴ Shlomo Aloni, *Six-Day War 1967: Operation Focus and the 12 hours that changed the Middle East* (Osprey Publishing, 2019), 86.

²⁵ Aloni, *Six-Day War*, 23-24.

²⁶ Aloni, *Six-Day War*, 15-17.

²⁷ Sal Sidoti, *Airbase Operability: A Study in Airbase Survivability and Post-Attack Recovery*, (Aerospace Centre, 2001), 38-44.

²⁸ Martin Middlebrook, *The Argentine Fight for the Falklands* (Pen & Sword, 2003), 76-78.

²⁹ Admiral Sandy Woodward with Patrick Robinson, *One Hundred Days: The Memoirs of the Falklands Battle Group Commander* (Harper Collins, 2003), 271-278.

³⁰ "The San Carlos FOB (Forward Operating Base)", Think Defence, accessed October 13, 2024, <https://www.thinkdefence.co.uk/2024/06/the-san-carlos-fob-forward-operating-base/>

³¹ Think Defence. "The San Carlos FOB."

The last decade of the 20th century would see the most devastating counter air campaign in history. Iraq started the 1991 Gulf War 636 operational combat aircraft, protected by 594 hardened aircraft shelters spread across 17 airbases, with a further 7 airbases and 34 dispersal bases available if needed, all forming part of an IADS that included dozens of radars, hundreds of Surface to Air Missiles (SAMs) and thousands of Anti-Aircraft Artillery (AAA) guns.³² Against this, the US led coalition amassed more than 2600 aircraft, including more than 1850 fighter / attack aircraft, which would fly almost 120,000 sorties during the six week war, achieving air supremacy in less than two weeks.³³ The coalition destroyed 375 Hardened Aircraft Shelters and 245 aircraft for the loss of 38 aircraft during the course of the war.³⁴



Figure 7: Iraqi Hardened Aircraft Shelter destroyed by coalition bombs during the Gulf War.³⁵

The experience of the Six Day War and Gulf War showed that air forces could be devastated on the ground when an adversary gained freedom of action in the air through either surprise or overwhelming force. In the Gulf War even extensive hardening of airbases provided minimal protection. However, in a contested air environment an adversary could struggle to mount effective attacks against a network of dispersed bases. The Falklands War showed that in remote environments with sparse infrastructure, the ability to utilise, deny or create airbases could significantly affect the ability to prosecute an air war. British efforts in North Africa and the Falklands and Communist efforts in Vietnam demonstrated that where air power could not be brought to bear against airbases, infiltration by ground forces for assault or stand off attack could still be used to degrade an adversary's air capability. This all shows the need to hedge the basing of air operations against a range of possible threats that could emerge in different circumstances.

Contemporary Threats, Concepts and Lessons.

The Gulf War also marked the end of the Cold War and the beginning of quarter century of focus on peacekeeping, counter terrorism and counter insurgency for western

³² Richard P. Hallion, *Desert Storm 1991: The most shattering air campaign in history*, (Osprey Publishing, 2022), 20-28.

³³ Hallion, *Desert Storm*, 8, 14, 89-90.

³⁴ Hallion, *Desert Storm* 59-60, 91.

³⁵ Imperial War Memorial, *The remains of an Iraqi Hardened Aircraft Shelter (HAS) destroyed by Coalition Laser Guided Bombs*, Imperial War Memorial, Catalogue no. GLF 390, <https://www.iwm.org.uk/collections/item/object/205018648>

militaries. During this period western air supremacy was unchallenged, although ground attacks were still occasionally mounted against airbases, most notably in Afghanistan where one attack killed two personnel, wounded seventeen and destroyed six aircraft.³⁶ From the mid-2010s this outlook began to change driven by concern amongst the US and allies (including Australia) about the emergence of the People's Republic of China as peer military threat. In the US *Quadrennial Defence Review 2014*, China is not mentioned in the executive summary and there is one sentence in the *Future Security Environment* chapter about, "the rapid pace and comprehensive scope of China's military modernisation", and the, "relative lack of transparency and openness from China's leaders".³⁷ In the most recent US *National Defence Strategy 2022*, China is explicitly identified as the, "pacing challenge", for the US and first section of the *Security Environment* chapter is about, "Strategic Competition with the People's Republic of China".³⁸ Since the 2022 Russian invasion of Ukraine, there has also been the example of a high intensity war between modern European military forces where neither has been able to gain control of the air. These factors have combined to create a focus on new threats from evolving technology, new concepts for generating airpower in a contested environment and lessons from current conflict.

Technology has evolved considerably since the end of the Cold War. The most significant technologies that affect the threat to airbases are satellite surveillance, the integration of surveillance with stand-off weapons into Anti-Access / Area Denial systems (A2AD) and uncrewed aircraft, or drones, used for both surveillance and attack. The ongoing improvement in electronics has dramatically decreased the size of satellites while providing equally dramatic increases in performance. What was previously the domain of nation states is now available commercially. For example, one company offers 0.5m resolution visual satellite imagery within three hours of the satellite pass, with multiple passes per day.³⁹ Another company offers all weather, high resolution synthetic aperture radar imagery daily.⁴⁰ This means that high quality surveillance and targeting information is now rapidly available to almost anyone commercially, and that the classified capabilities of major space powers are likely to be even more effective. The integration of dramatically improved surveillance and targeting with equally dramatic improvements in the precision of cruise and ballistic missiles has enabled the created of A2AD systems that reach far beyond the borders of major powers. Simultaneously, drones have changed the dynamics of prosecuting an attack. Used as weapons, drones provide a stand-off capability that is generally less effective than cruise or ballistic missiles, but orders of magnitude cheaper than either the offensive missiles they replace, or the

³⁶ "Camp Bastion Attack report published," UK Parliament, accessed October 13, 2024, <https://committees.parliament.uk/work/2225/afghanistan-camp-bastion-attack/news/183159/camp-bastion-attack-report-published/#:~:text=The%20ensuing%20engagement%20lasted%20into,of%20six%20US%20Harrier%20jets>.

³⁷ U.S. Department of Defense, *Quadrennial Defence Review 2014* (U.S. Department of Defense, 2014), 4, <https://history.defense.gov/Portals/70/Documents/quadrennial/QDR2014.pdf?ver=tXH94SVvSQLVw-ENZ-a2pQ%3d%3d>

³⁸ U.S. Department of Defense, 2022 National Defense Strategy of the United States of America including the 2022 Nuclear Posture Review and the 2022 Missile Defense Review (U.S. Department of Defense, 2022), 2, 4, <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.pdf>

³⁹ "High Resolution Satellite Imagery with Planet Satellite Tasking," Planet Labs, accessed October 13, 2024, <https://www.planet.com/products/high-resolution-satellite-imagery/>

⁴⁰ "SAR Data Products," Capella Space, accessed October 13, 2024, https://cdn.prod.website-files.com/66b32de523b6c4b17bad83f2/66fdca1efb612bc02ce5b444_Capella%20Space%20Data%20Product%20Guide.pdf

defensive missiles used to intercept them.⁴¹ They enable high volume precision attack, allowing the attacker to engage a wide large number of dispersed targets or use numbers to soak up defensive weapons before following up with more capable weapons.

In response to the threat posed by A2AD systems in particular, the USAF has developed the concept of Adaptive Basing. Adaptive Basing, “calls for forces to disaggregate capabilities from a single base and disperse forces and capabilities to many locations for operational manoeuvre(sic)”.⁴² Research to support Adaptive Basing has developed ideas such as “stay and fight” bases and “dispersal” bases to support air operations in contested areas, ideas that bear significant similarity to those used by the RAF during the Battle of Britain.⁴³ The concept of disaggregating capabilities is being explored beyond bases airbases for physical aircraft to include the command and control system. This looks beyond a single, large, easily targetable Combined Air Operations Centre in a theatre to an, “agile and dispersible set of processes and command and control structures”.⁴⁴ The concept of Adaptive Basing is support by an organisational concept of Agile Combat Employment, where the USAF is seeking, “both new technology and a culture shift”, so that in a highly contested environment it is possible, “to create many small locations from which the Air Force can quickly operate, creating too many targets for prospective enemies to successfully attack”.⁴⁵ Research has identified that this method of operating may increase risk in some aspects of air operations, but will reduce risk overall in a contested A2/AD environment.⁴⁶ Observers of the Chinese PLAAF have noted that China appears to have identified similar vulnerabilities in its air power basing and has started to conduct tentative exercises to test dispersed airbase operational concepts.⁴⁷ For Taiwan the problem is even more acute. Taiwan has extensive hardening of aircraft facilities, including potentially underground hangars, but has relatively small landmass with only a limited number of runways which are vulnerable to destruction.⁴⁸

While theorists attempt to discern the shape of a future war in the western Pacific, the largest war in Europe since the Second World War is providing practical lessons. However, the fact that the war is ongoing with both sides seeking to maintain operational security and maximise propaganda value, means that lessons must be treated with some

⁴¹ Howard Altman, “What Does A Shahed-136 Really Cost,” *The War Zone*, February 8, 2024, <https://www.twz.com/news-features/what-does-a-shahed-136-really-cost>

⁴² Patrick Mills et al., *Estimating Air Force Deployment Requirements for Lean Force Packages: A Methodology and Decision Support Tool Prototype* (RAND Corporation, 2017), 22, https://www.rand.org/pubs/research_reports/RR1855.html

⁴³ Patrick Mills et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts* (RAND Corporation, 2020), xiii, https://www.rand.org/pubs/research_reports/RR4200.html

⁴⁴ David A. Deptula, “A New Battle Command Architecture for Joint All-Domain Operations,” *AEther: A Journal of Strategic Airpower & Spacepower* 1, no. 1 (2022): 56, <https://www.jstor.org/stable/48651807?seq=6>

⁴⁵ CQ Brown Jr., “Ready to Meet the Moment,” *AEther: A Journal of Strategic Airpower & Spacepower* 1, no. 1 (2022): 11, <https://www.jstor.org/stable/48651801?seq=4>

⁴⁶ Russell S. Badowski, “Airpower Projection in the Antiaccess / Area-Denial Environment,” in *Defending Air Bases in an Age of Insurgency*, ed. COL Shannon W. Caudill, USAF, Retired (Air University Press, 2019), 279-281 <https://www.jstor.org/stable/resrep19551.15?seq=14>

⁴⁷ Derek Solen, “The PLA Air Force’s Efforts Towards Agile Combat Employment,” *China Brief* 21, no.17 (2021): 18-22, <https://jamestown.org/program/the-pla-air-forces-efforts-toward-agile-combat-employment/>

⁴⁸ William S. Murray, “Revisiting Taiwan’s Defense Strategy,” *Naval War College Review* 61, no. 3 (2008): 21-24, <https://www.proquest.com/docview/205937062/fulltextPDF/8E7E4EBA74A44BD1PQ/1?accountid=10479&sourcetype=Scholarly%20Journals>

caution. Despite expectations prior to the war Russia, “failed to achieve air superiority, failed at suppression of enemy air defence and failed to deny the use of airpower to its adversary”.⁴⁹ Available information from the conflict has highlighted the criticality of mobility, dispersal and deception for survival when fighting a more capable adversary. The Russians were able to hit around 75% of stationary Ukrainian Air Defence sites within the first 48hrs, but only 10% of mobile sites.⁵⁰ Ukraine was able to use its strategic depth to disperse its aircraft to positions deeper inside Ukraine to save them from effective Russian attack.⁵¹ The Ukrainians have also proved effective at using deception to mitigate Russian attacks, notably using aircraft shelters with images of battle damage over repaired sites to confuse satellite battle damage assessments.⁵² One challenge that has proved difficult for Ukraine to effectively counter is the mass of Iranian Shahed-136 long range attack drones. The Shahed is relatively simple, low-cost, long-range weapon. Individual Shahed drones are not difficult for Ukrainian air defence to engage, however their simplicity means that they can be produced much more rapidly and easily than most of the missiles used to shoot them down, meaning that mass attacks result in significant depletion of air defence magazines.⁵³

Most of the underlying principles of many of the contemporary threats, concepts and lessons would be recognisable to air power practitioners of the Second World War and Cold War. While the technology has evolved almost beyond recognition since then, the biggest conceptual shift is arguably the reversion to a contested air domain after the anomaly of the post-Cold War period. Even the mass precision attack by drones has similarities to mass attacks by crewed aircraft or kamikazes during the Second World War.

Airfield Infrastructure to Support Survivable Air Operations in Northern Australia

Australia faces significant challenges in applying contemporary thinking to the defence of northern Australia. The six military airbases across northern Australia cover a vast area and, except for RAAF Darwin and RAAF Tindal, have large distances between them. This limits the ability to disperse aircraft between bases to defend any particular area of northern Australia. All of the bases have some level of hardening, with Ordnance Loading Areas (OLAs) for fighter aircraft that have revetments and a roof that provides protection from weather and satellite observation, but not from attack (Figure 8). However, the number of these OLAs is limited, with only 5 at RAAF Curtin, 10 at RAAF Townsville and RAAF Scherger, 12 at RAAF Darwin and RAAF Learmonth and 22 at RAAF Tindal.⁵⁴ This means that for Darwin region there are 34 targetable locations where fighters could be operating shielded from satellite surveillance, for the Coral Sea there are 20 and for the Pilbara there are 15. The bases also have several movement

⁴⁹ Sean M. Wiswesser, “Potemkin on the Dnieper: the Failure of Russian Airpower in the Ukraine War,” *Small Wars & Insurgencies* 34, no. 7 (2023): 1205, <https://www.tandfonline.com/doi/pdf/10.1080/09592318.2023.2187201>

⁵⁰ Mykhaylo Zabrotskyi et al., *Preliminary Lessons in Conventional Warfighting from Russia’s Invasion of Ukraine: February-July 2022* (RUSI, 2022), 24, <https://rusi.org/explore-our-research/publications/special-resources/preliminary-lessons-conventional-warfighting-russias-invasion-ukraine-february-july-2022>

⁵¹ Colonel Ioan Mischie, “Causes of the Failure of Russian Aviation Achieving Air Supremacy in the Ukraine Conflict and Subsequent Influences on its Evolution,” *Romanian Military Thinking* 1 (2023): 35-36, <https://research.ebsco.com/c/2jmkxr/viewer/pdf/nvfd3c6jiz>

⁵² Zabrotskyi et al., *Preliminary Lessons*, 25-26.

⁵³ Justin Bronk et al., *The Russian Air War and Ukrainian Requirements for Air Defence* (RUSI, 2022), 32-34, <https://rusi.org/explore-our-research/publications/special-resources/russian-air-war-and-ukrainian-requirements-air-defence>

⁵⁴ Counted using Google Earth App October 13, 2024.

surfaces for larger aircraft, some with revetments but none with overhead shelter, making them vulnerable to satellite observation.

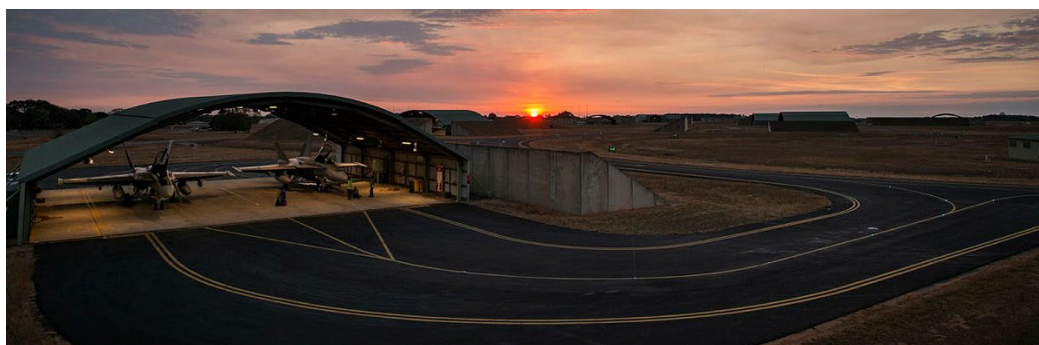


Figure 8: Aircraft in Ordnance Loading Area revetment at RAAF Darwin.⁵⁵

In the current environment of frequent satellite observation and the potential for massed long range precision attack, military aircraft operating out of northern Australia are vulnerable to either being destroyed on the ground or having their base rendered inoperable. Constructing hardened aircraft shelters to improve protection would be expensive and, as the Iraqi experience in the Gulf War demonstrated, not necessarily effective. A more cost-effective solution could be to utilise civilian airfields to enable dispersal of military aircraft, with redundancy and mutual support of airbase options. The requirements for unrestricted operation of Australian combat aircraft are shown in **Table 1**, the airfields in northern Australia with runways that can support these aircraft are shown in **Table 2** and the location of these airfields is mapped in Figure 9.

⁵⁵ David Campbell, *Ex Pitch Black*, 2016, Department of Defence, ref. S20161660, https://images.defence.gov.au/assets/Home/Search?Query=20160818raaf8595531_009.jpg&Type=Filename

Aircraft Type	MTOW (kg)	ACN ⁵⁶								Runway Length (m)
		Flexible				Rigid				
		A	B	C	D	A	B	C	D	
F-35A	29900 ⁵⁷	29.4	28.5	27.8	27.3	31.3	31.2	30.8	30.1	2438 ⁵⁸
E-7A ⁵⁹	77564 ⁶⁰	36.2	38.0	41.8	46.9	41.1	43.9	46.0	47.2	2500 ⁶¹
P-8A	85820 ⁶²	48.1	51.3	56.2	61.1	55.6	58.9	61.3	62.5	2844 ⁶³
KC-30A	233000 ⁶⁴	56.4	61.6	71.3	95.0	52.8	61.2	72.6	83.6	3000 ⁶⁵

Table 1: Aircraft data for Australian Combat Aircraft

⁵⁶ "ACN and ACR Calculator," Tri-Service Transportation: Pavements-Transportation – Community of Practice, accessed October 13, 2024, <https://transportation.erd.c.dren.mil/acnacr/>

⁵⁷ "Aircraft: F-35A Lightning II," Royal Australian Air Force, accessed October 13, 2024, <https://www.airforce.gov.au/aircraft/f-35a-lightning-ii>

⁵⁸ Department of Defence, *Facilities Requirements for the New Air Combat Capability*, 7.

⁵⁹ Official Data was unavailable for the E-7A. The E-7A is a derivative of the Boeing 737-700, so Boeing 737-700 data was used.

⁶⁰ Boeing Commercial Airplanes, *D6-58325-7 Rev A: Next-Generation 737 Airplane Characteristics for Airport Planning* (Boeing, 2023), 3-29
https://www.boeing.com/content/dam/boeing/boeingdotcom/commercial/airports/acaps/737NG_REVA.pdf

⁶¹ Boeing Commercial Airplanes, *Next-Generation 737 Airplane Characteristics*, 3-29, 2000ft airfield at MTOW.

⁶² "P-8A Poseidon Maritime Patrol Aircraft: Technical Specifications," Boeing, accessed October 13, 2024, <https://www.boeing.com/defense/p-8-poseidon#tech-spec>

⁶³ Department of Defence, *Facilities Requirements for the Maritime Patrol Aircraft Replacement Capability: Statement of Evidence to the Parliamentary Committee on Standing Works* (Commonwealth of Australia, 2014), 19-20,
<https://www.aph.gov.au/DocumentStore.ashx?id=cbc05e6e-30a1-4658-8673-734072ae593b&subId=301132>

⁶⁴ "Aircraft: KC-30A Multi-Role Tanker Transport," Royal Australian Air Force, accessed October 13, 2024, <https://www.airforce.gov.au/aircraft/kc-30a-mrtr>

⁶⁵ Airbus, *A330: Aircraft Characteristics Airport and Maintenance Planning: Rev Jul 01/23* (Airbus S.A.S, 2023), s3-3-2 p4, ~500ft airfield at MTOW,
https://aircraft.airbus.com/sites/g/files/jlcbta126/files/2023-08/ac_a330_jul2023_0.pdf

Airport	Code	Latitude	Longitude	Altitude (ft)	Type	Aircraft
Alice Springs	YBAS	23048'30"S	133054'03"E	1789	Public	F-35A
Ayers Rock	YAYE	25011'19"S	130058'32"E	1626	Public	F-35A / E-7A
Cairns INTL	YBCS	16053'09"S	145045'19"E	10	Public	All
Christmas Creek	YCHK	22021'21"S	119038'33"E	1454	Private	F-35A / E-7A
Curtin	YCIN	17034'53"S	123049'42"E	300	Military	F-35A / E-7A
Darwin	YPDN	12024'53"S	130052'36"E	103	Military / Public	All
Eliwana	YEWA	22025'44"S	116053'41"E	1576	Private	F-35A / E-7A
Ginbata	YGIA	22034'52"S	120002'08"E	1409	Private	F-35A / E-7A
Iron Bridge	YIBO	21017'12"S	118052'59"E	666	Private	F-35A / E-7A
Learmonth	YPLM	22014'08"S	114005'19"E	19	Military	All[1]
McArthur River	YMHU	16026'36"S	136004'36"E	136	Private	F-35A
Mount Isa	YBMA	20039'50"S	139029'19"E	1121	Public	F-35A
Port Headland	YPPD	20022'40"S	118037'35"E	33	Public	F-35A / E-7A
Rockhampton	YBRK	23022'55"S	150028'31"E	36	Public	F-35A / E-7A
Scherger	YBSG	12037'26"S	142005'14"E	145	Military	F-35A / E-7A
Tindal	YPTN	14031'16"S	132022'40"E	443	Military	All[2]
Townsville	YBTL	19015'09"S	146045'55"E	18	Military / Public	F-35A / E-7A / P-8A[3]

Table 2: Airfield data for northern Australia⁶⁶

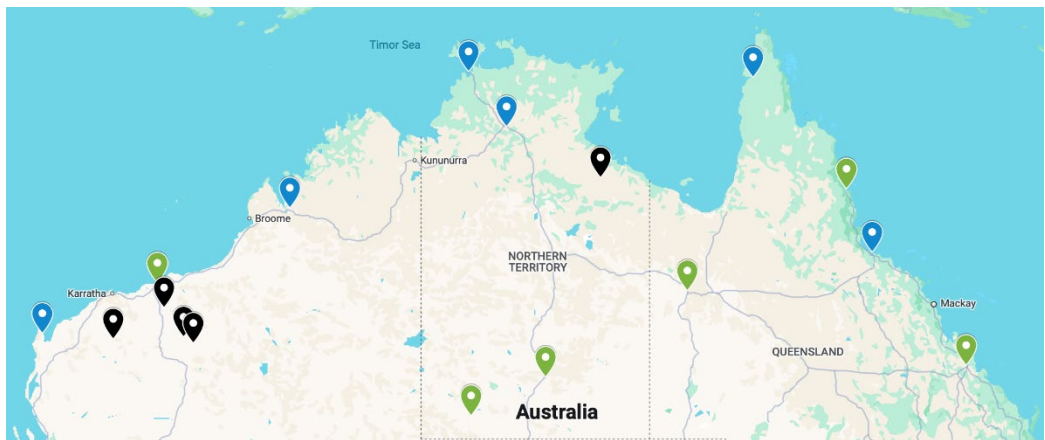


Figure 9: Combat Aircraft capable airfields in northern Australia. Military airfields are blue, public airfields are green and private airfields are black.

This shows that there are a limited number of civilian airfields in northern Australia with runways suitable to support unrestricted operations by Australian combat aircraft. The KC-30A tanker aircraft is particularly restricted, with only RAAF Learmonth on the west coast, RAAF Darwin and Tindal in the centre and Cairns International on the east coast able to support unrestricted operations. Some of the airfields, such as Alice Springs and

⁶⁶ Airservices Australia, *ERSA*, except as noted.

Ayers Rock are too remote to be useful in most circumstances. However, there is a cluster of 7 airfields around the Pilbara, including RAAF Learmonth and RAAF Curtin, that could potentially be used to support dispersed, agile combat operations in this strategically vital area. There is also the potential to increase the number of airfields available by restricting aircraft take off weights and accepting operational limitations, or by accepting increased risk through pavement concessions or operational waivers.

A suitable runway alone is not sufficient for air combat operations. As identified earlier, fuel, other consumables and suitable parking for aircraft replenishment are also required. Some form of communications and personnel sustainment is essential, while consideration also needs to be given to appropriate levels of protection. Figure 10 is a satellite photo of a typical Pilbara mining airfield at Christmas Creek Mine, showing the limited aircraft parking available. The airfield has a typical mining airfield fuel capacity of just over 100,000l.⁶⁷ For context, an F-35A has a fuel capacity of approximately 10,000l.⁶⁸ During the 2003 Gulf War, Australian F/A-18A Hornets achieved just under 1 sortie per aircraft per day.⁶⁹ Therefore, a half squadron deployment of six F-35A aircraft would need at least six OLAs and approximately 60,000l of fuel per day, with double those numbers for full squadron.



Figure 10: Christmas Creek Mine airport.⁷⁰ Note limited aircraft parking available.

To turn an airfield like Christmas Creek into functioning dispersal base requires rapid establishment of aircraft parking, taxiways, fuel storage, communications, personnel support and ideally protection. Fortunately, much of the equipment required to achieve this is in existence, if not necessarily in use with the Australian Defence Force (ADF). The ADF already has deployable communications and facilities to sustain personnel. As the British demonstrated during the Falklands War, temporary movement surfaces capable of supporting aircraft taxiing have existed for some time. Many of these systems are in use on Australian mine sites and could support fighter movements, although larger aircraft such as the E-7A will probably have to use the existing movement surfaces.⁷¹ Deployable revetments have been in widespread use since the Gulf War.⁷² Containerised shelters able to protect fighter sized aircraft protection from the weather

⁶⁷ Christmas Creek Aerodrome Supervisor, email to author, October 7, 2024.

⁶⁸ Royal Australian Air Force, "F-35A Lightning II."

⁶⁹ Air Vice-Marshal Mel Hupfeld, "The 2003 Gulf War – Australia," in *Proceedings of the 2014 RAAF Air Power Conference: A Century of Military Aviation 1914-2014*, ed. Keith Brent (Air Power Development Centre, 2014), 220-221.

⁷⁰ Satellite view of Christmas Creek Mine airport, Google Maps, accessed October 13, 2024 https://www.google.com/maps/@-22.3554942,119.6426159,1635m/data=!3m1!1e3?entry=ttu&g_ep=EgoyMDI0MTAwOS4wIKXMDSoASAFAQAw%3D%3D

⁷¹ Soloco LLC, Dura-Base Composite Mat System: Application Evaluation and Design Rev 0.0 (Soloco LLC, 2002), 3.

⁷² "Mil Units," HESCO, accessed October 13, 2024, <https://www.hesco.com/products/mil-units/>

and more importantly satellite observation are also readily commercially available.⁷³ The ready availability of relatively cheap commercial solutions opens the possibility of establishing deployable infrastructure at every suitable airfield in the Pilbara, confronting an adversary with a much more complicated surveillance and targeting problem. Deployable infrastructure could also be used outside Australia if required, unlike fixed infrastructure on airbases. The biggest challenge is likely to be fuel. The fuel supply at many of these airfields is insufficient for even two days of half squadron operations, making deployable fuel infrastructure essential. However, fuel bladders required to support dispersed air operations are large, soft targets, easily visible by satellite. They still require fuel transport to resupply and move the fuel if a new dispersal location is used. The use of road trains for storage and transport may provide an alternative. A four-trailer road train can hold over 140,000l of fuel, enabling fuel storage to be camouflaged out of satellite view and easily relocated to new base if required.⁷⁴

Conclusions, Further Research and Policy Implications

The return of great power competition, dramatic increase in space surveillance capabilities and development of A2/AD systems has removed the security enjoyed by airbases during the post-Cold War period. Contemporary concepts such as Adaptive Basing and Agile Combat Employment have more in common with doctrine of the Second World War and Cold War than recent practice. The sparsity of military airbase infrastructure in northern Australia renders it extremely challenging to implement contemporary concepts using military infrastructure alone. However, as this research has established, there is potential to utilise civilian airfields to improve the resilience and survivability of air operations in northern Australia, particularly in the strategically important economic region of the Pilbara. However, this currently exists as potential only. To realise this potential will require further research and investment in materiel, personnel and organisational structures.

The most pressing research to realise this potential is field research and trials. Ultimately it is necessary to survey the airfields and associated infrastructure and build relationships with the relevant stakeholders to understand what is possible and practical. Trials are necessary to understand what materiel works and what doesn't, what personnel skills are required and what organisational structures are most effective. It is also necessary to play the enemy during these trials, in particular turning space-based surveillance systems against the trials to understand how vulnerable these activities are to detection.

The key policy implication of this research is that civil airfields are a potentially vital component of national defence infrastructure. Cairns International Airport is particularly significant as the only airfield on the east coast of northern Australia where the KC-30A tanker aircraft can operate to full capability. This would be especially important in the event of air operations over the Coral Sea or Papua New Guinea. As such, Defence should build a relationship with the Airport owner as a key stakeholder to ensure that this strategic capability is not compromised. Defence should also maintain a watching brief on substantial public and private airfields in northern Australia and be ready to engage if advantageous. An arrangement where Defence pays the marginal cost of lengthening or strengthening the runway of a suitably located new mining airfield is much cheaper than building a new military airfield from scratch. Developing a deployable military capability to turn a civilian airfield into a functioning airbase reduces the risk of wasted investment because these capabilities can be used in Australia, the region, or globally if required. In the coordinated, whole-of-nation approach to National Defence envisaged by the

⁷³ "Container Mounted Dome Shelters," Allshelter, accessed October 13, 2024, <https://www.allshelter.com.au/product/container-mounted-shelters/>

⁷⁴ Aero Refuellers Port Headland, Telephone conversation with author, October 3, 2024.

government, utilisation of civilian airfields offers the potential for more effective, survivable and resilient air operations that are less costly than what Defence could achieve alone. They offer the best opportunity for Australian Air Power to survive the punch in the face.

References

3 Seas Europe. "The Underground Airbase That Could Launch Planes." Accessed October 13, 2024. <https://3seaseurope.com/zeljave-yugoslavia-underground-airbase-croatia/>

Airbus. *A330: Aircraft Characteristics Airport and Maintenance Planning: Rev Jul 01/23*. Airbus S.A.S, 2023. https://aircraft.airbus.com/sites/g/files/jlcbta126/files/2023-08/ac_a330_jul2023_0.pdf

Airservices Australia. *ERSA effective 21 Mar 2024*. Airservices Australia, 2024.

Allshelter. "Container Mounted Dome Shelters." Accessed October 13, 2024. <https://www.allshelter.com.au/product/container-mounted-shelters/>

Aloni, Shlomo. *Six-Day War 1967: Operation Focus and the 12 hours that changed the Middle East*. Osprey Publishing, 2019.

Altman, Howard. "What Does A Shahed-136 Really Cost." *The War Zone*, February 8, 2024. <https://www.twz.com/news-features/what-does-a-shahed-136-really-cost>

Australian Strategic Policy Institute. "ASPI Strategist: North of 26° South." Accessed October 13, 2024. <https://www.aspistrategist.org.au/dinkus/north-of-26-south/>

Australian War Memorial. *Phan Rang, Vietnam. 1967-07. Aerial view of the aircraft revetments at the airbase*. 1967. Australian War Memorial, Accession no. P01978.002 <https://www.awm.gov.au/collection/C287384>

Badowski, Russell S. "Airpower Projection in the Antiaccess / Area-Denial Environment." in *Defending Air Bases in an Age of Insurgency*, edited by COL Shannon W. Caudill, USAF, Retired. Air University Press, 2019. <https://www.jstor.org/stable/resrep19551.15?seq=14>

Boeing. "P-8A Poseidon Maritime Patrol Aircraft: Technical Specifications." Accessed October 13, 2024. <https://www.boeing.com/defense/p-8-poseidon#tech-spec>

Boeing Commercial Airplanes. *D6-58325-7 Rev A: Next-Generation 737 Airplane Characteristics for Airport Planning*. Boeing, 2023. https://www.boeing.com/content/dam/boeing/boeingdotcom/commercial/airports/acaps/737NG_REVA.pdf

Bronk, Justin, Nick Reynolds and Jack Watling. *The Russian Air War and Ukrainian Requirements for Air Defence*. RUSI, 2022. <https://rusi.org/explore-our-research/publications/special-resources/russian-air-war-and-ukrainian-requirements-air-defence>

Brown, CQ Jr. "Ready to Meet the Moment." *AEther: A Journal of Strategic Airpower & Spacepower* 1, no. 1 (2022): 8-12, <https://www.jstor.org/stable/48651801?seq=4>

Campbell, David. *Ex Pitch Black*. 2016. Department of Defence, ref. S20161660. https://images.defence.gov.au/assets/Home/Search?Query=20160818raaf8595531_009.jpg&Type=Filename

Capella Space. "SAR Data Products." Accessed October 13, 2024. <https://cdn.prod.website->

files.com/66b32de523b6c4b17bad83f2/66fdca1efb612bc02ce5b444_Capella%20Space%20Data%20Product%20Guide.pdf

Civil Aviation Safety Authority *Advisory Circular AC 139.C-07v 1.0: Strength Rating of Aerodrome Pavements*. Civil Aviation Safety Authority, 2021.
<https://www.casa.gov.au/strength-rating-aerodrome-pavements>

Clausewitz, Carl Von. *On War*. Translated by Michael Howard and Peter Paret. Princeton University Press, 1989.

Collier, Paul, Alastair Finlan, Mark J. Grove et al. *The Second World War: A World in Flames*. Osprey Publishing, 2004.

Defence, Department of. *Facilities Requirements for the New Air Combat Capability: Statement of Evidence to the Parliamentary Committee on Standing Works*. Commonwealth of Australia, 2014.
<https://www.aph.gov.au/DocumentStore.ashx?id=b2b1ed75-dc16-447a-a878-b8670edb674d&subId=254100>

Defence, Department of. *Facilities Requirements for the Maritime Patrol Aircraft Replacement Capability: Statement of Evidence to the Parliamentary Committee on Standing Works*. Commonwealth of Australia, 2014.
<https://www.aph.gov.au/DocumentStore.ashx?id=cbc05e6e-30a1-4658-8673-734072ae593b&subId=301132>

Defence, Department of. *Integrated Investment Program 2024*. Commonwealth of Australia, 2024. <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>

Defence, Department of. *National Defence Strategy 2024*. Commonwealth of Australia, 2024. <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>

Deptula, David A. "A New Battle Command Architecture for Joint All-Domain Operations," *AEther: A Journal of Strategic Airpower & Spacepower* 1, no. 1 (2022): 51-56, <https://www.jstor.org/stable/48651807?seq=6>

Dildy, Douglas C. *Battle of Britain 1940: The Luftwaffe's 'Eagle Attack'*. Osprey Publishing, 2018.

Hallion, Richard P. *Desert Storm 1991: The most shattering air campaign in history*, Osprey Publishing, 2022.

HESCO. "Mil Units." Accessed October 13, 2024. <https://www.hesco.com/products/mil-units/>

Hupfeld, Air Vice-Marshal Mel. "The 2003 Gulf War – Australia." In *Proceedings of the 2014 RAAF Air Power Conference: A Century of Military Aviation 1914-2014*, edited by Keith Brent. Air Power Development Centre, 2014.

Imperial War Memorial, *The remains of an Iraqi Hardened Aircraft Shelter (HAS) destroyed by Coalition Laser Guided Bombs*, Imperial War Memorial, Catalogue no. GLF 390, <https://www.iwm.org.uk/collections/item/object/205018648>

Infrastructure, Transport, Regional Development, Communication and the Arts,

Department of. "Office of Northern Australia." Accessed October 13, 2024.
<https://www.infrastructure.gov.au/territories-regions-cities/regional-australia/office-northern-australia>

Middlebrook, Martin. *The Argentine Fight for the Falklands*. Pen & Sword, 2003.

Mills, Patrick, James A. Leftwich, Kristen Van Abel and Jason Mastbaum. *Estimating Air Force Deployment Requirements for Lean Force Packages: A Methodology and Decision Support Tool Prototype*. RAND Corporation, 2017.
https://www.rand.org/pubs/research_reports/RR1855.html

Mills, Patrick, James A. Leftwich, John G. Drew et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts*. RAND Corporation, 2020. https://www.rand.org/pubs/research_reports/RR4200.html

Mischie, Colonel Ioan. "Causes of the Failure of Russian Aviation Achieving Air Supremacy in the Ukraine Conflict and Subsequent Influences on its Evolution," *Romanian Military Thinking* 1 (2023): 30-47.
<https://research.ebsco.com/c/2jmkxr/viewer/pdf/nvfd3c6jiz>

Moer, Zachary T., Christopher M. Chini, Peter P. Feng and Steven J. Schuldt. "Contested Agile Combat Employment: A Site Selection Methodology." *Air & Space Operations Review* 1, no. 3 (2022): 62-77.
<https://research.ebsco.com/c/2jmkxr/viewer/pdf/datbfjupdn>

Murray, William S. "Revisiting Taiwan's Defense Strategy." *Naval War College Review* 61, Iss. 3 (2008): 12-39
<https://www.proquest.com/docview/205937062/fulltextPDF/8E7E4EBA74A44BD1PQ/1?accountid=10479&sourcetype=Scholarly%20Journals>

Parliament of Australia. "4. RAAF Base Tindal Stage 6 Redevelopment and United States Force Posture Initiative Airfield Works." Accessed October 13, 2024.
[https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural and Regional Affairs and Transport/OffshorePetroleumBills/Report/Section?id=committees%2Freportjnt%2F024459%2F73081](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/OffshorePetroleumBills/Report/Section?id=committees%2Freportjnt%2F024459%2F73081)

Parliament of Australia. "Department of Defence – RAAF Base Learmonth Redevelopment Enabling KC-30A Operations, Exmouth, Western Australia." Accessed October 13, 2024.
https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Public_Works/DoD_RAAFLearmonth

Planet Labs. "High Resolution Satellite Imagery with Planet Satellite Tasking." Accessed October 13, 2024. <https://www.planet.com/products/high-resolution-satellite-imagery/>

Quote Investigator. "Everybody Has Plans Until They Get Hit for the First Time." Accessed October 13, 2024. <https://quoteinvestigator.com/2021/08/25/plans-hit/>

Royal Australian Air Force. "About Us: Bases." Accessed October 13, 2024.
<https://www.airforce.gov.au/about-us/bases>

Royal Australian Air Force. "Aircraft: F-35A Lightning II." Accessed October 13, 2024.
<https://www.airforce.gov.au/aircraft/f-35a-lightning-ii>

Royal Australian Air Force. "Aircraft: KC-30A Multi-Role Tanker Transport." Accessed October 13, 2024. <https://www.airforce.gov.au/aircraft/kc-30a-mrtrt>

Sidoti, Sal. *Airbase Operability: A Study in Airbase Survivability and Post-Attack Recovery*. Aerospace Centre, 2001.

Solen, Derek. "The PLA Air Force's Efforts Towards Agile Combat Employment." *China Brief* 21, no.17 (2021): 18-22, <https://jamestown.org/program/the-pla-air-forces-efforts-toward-agile-combat-employment/>

Soloco LLC. *Dura-Base Composite Mat System: Application Evaluation and Design Rev 0.0*. Soloco LLC, 2002.

Tri-Service Transportation: Pavements-Transportation – Community of Practice. "ACN and ACR Calculator." Accessed October 13, 2024. <https://transportation.erdc.dren.mil/acnacr/>

Think Defence. "The San Carlos FOB (Forward Operating Base)." Accessed October 13, 2024. <https://www.thinkdefence.co.uk/2024/06/the-san-carlos-fob-forward-operating-base/>

UK Parliament. "Camp Bastion Attack report published." accessed October 13, 2024. <https://committees.parliament.uk/work/2225/afghanistan-camp-bastion-attack/news/183159/camp-bastion-attack-report-published/#:~:text=The%20ensuing%20engagement%20lasted%20into,of%20six%20US%20Harrier%20jets.>

U.S. Air Forces in Europe. "Raptor pilots visit future generation." Accessed October 13, 2024. <https://www.usafe.af.mil/News/Article-Display/Article/748112/raptor-pilots-visit-future-generation>

U.S. Department of Defense. *2022 National Defense Strategy of the United States of America including the 2022 Nuclear Posture Review and the 2022 Missile Defense Review*. U.S. Department of Defense, 2022. <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.pdf>

U.S. Department of Defense, *Quadrennial Defense Review 2014*. U.S. Department of Defense, 2014. <https://history.defense.gov/Portals/70/Documents/quadrennial/QDR2014.pdf?ver=tXH94SVvSQLVw-ENZ-a2pQ%3d%3d>

Wiswesser, Sean M. "Potemkin on the Dnieper: the Failure of Russian Airpower in the Ukraine War." *Small Wars & Insurgencies* 34, no. 7 (2023): 1205-1234. <https://www.tandfonline.com/doi/pdf/10.1080/09592318.2023.2187201>

Woodward, Admiral Sandy with Patrick Robinson *One Hundred Days: The Memoirs of the Falklands Battle Group Commander*. Harper Collins, 2003.

Zabrodskyi, Mykhaylo, Jack Watling, Oleksander V Danylyuk and Nick Reynolds. *Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February-July 2022*. RUSI, 2022. <https://rusi.org/explore-our-research/publications/special-resources/preliminary-lessons-conventional-warfighting-russias-invasion-ukraine-february-july-2022>



Self reliance in the national defence context. Analysis of contemporary parliamentary discourse

Major Brett Roberts

Major Brett Roberts is a Military Police Officer and graduate of the Australian Command and Staff Course (Military Art) class of 2024. He is currently appointed as the Executive Officer at the Office of the Military Attaché in Washington DC.

Introduction

This paper seeks to expand upon the literature on the longstanding concept of *self-reliance* in Australian defence policymaking in light of the recently adopted doctrine of *national defence*. This doctrine was born out of the Defence Strategic Review (DSR) of 2023 and later defined in the National Defence Strategy (NDS) of 2024 as ‘a coordinated, whole-of-government and whole-of-nation approach that harnesses all arms of national power to defend Australia and advance our interests.’¹ Historically, the self-reliance concept has co-existed with upholding the Australia-United States (US) alliance, creating tension between what it means for Australia to be self-reliant while relying on the alliance. Nowadays, national defence policy continues to heavily emphasise the importance of the Australia-US alliance while also seeking self-reliance. However, self-reliance is undefined in the DSR and NDS, so we need to look elsewhere to understand what self-reliance means to policymakers in the national defence context.

The purpose of this paper is to examine the parliamentary discourse on the topics of national defence and self-reliance since the release of the DSR. Other researchers have already published much material on the self-reliance concept; however, to my knowledge, this is the first work specifically analysing parliamentary discourse since the birth of the national defence doctrine. This discourse is illuminating as it offers the opportunity to explore what policymakers themselves mean by self-reliance in national defence beyond the text of the two policy documents. Specifically, this paper is focused on determining whether national defence redefines self-reliance beyond conceptions in the previous defence doctrine – *defence of Australia* (DoA) – which emphasised the ability of the Australian Defence Force (ADF) to defend Australia independently. Up front, I argue that the national defence doctrine does redefine self-reliance to mean the ability of domestic industry to support the ADF, as this is the main area of focus of parliamentary discourse in the national defence context. However, it specifically excludes any expectation of complete industrial self-reliance independent of allies and partners.

To demonstrate this, this paper is divided as follows. Section I presents a review of the policy and literature on the concept of self-reliance in Australian defence policy. A key

¹ Australian Government, National Defence: Defence Strategic Review (Canberra: Commonwealth of Australia, 2023), 32; Department of Defence, *National Defence Strategy* (Canberra: Commonwealth of Australia, 2024), 6.

outcome of this review is the development of two hypotheses with which to test parliamentary discourse on self-reliance and national defence. The first hypothesis describes self-reliance as the ability of the ADF to defend Australia independently, whereas the second shifts focus to the ability of domestic industry to support the ADF. Section II describes the data and research methodology used. As this paper is based on parliamentary discourse, it has relied exclusively on editions of the Hansard at the federal government level since the release of the DSR and has used a combination of quantitative and qualitative analyses to identify the most relevant information to test the hypotheses. I also address the key limitations of the research in this section. Section III summarises the findings of the research undertaken. These findings show that domestic industry is the most common theme in discussions on both national defence and self-reliance. Section IV provides a detailed discussion of the findings, including a selection of key Hansard extracts, and contrasts these with the hypotheses to prove this paper's thesis. Finally, this paper summarises the key findings of this research project and offers some recommendations for further research as the national defence concept matures.

Policy and literature review

In this section, this paper draws on the literature to define self-reliance in the history of defence policymaking and contrasts this definition with its usage in national defence policy. Following a review of the origin of the self-reliance concept, this section analyses the usage of the concept throughout the DoA era to define what self-reliance meant then: the ability of the ADF to defend Australia independently. Next, this section reviews the usage of the concept in the DSR and NDS to define what self-reliance might mean now: the ability of domestic industry to support the ADF. These two contrasting definitions form the basis of my two hypotheses with which to test parliamentary discourse.

Genesis of the self-reliance concept

In its genesis in Australian defence policymaking, self-reliance meant the ability of the ADF to defend the country independently, that is, without relying on the US or other allies for support except in extremis. In their book, *Girt by Sea: Re-Imagining Australia's Security*, Rebecca Strating and Joanne Wallis place this genesis over the period 1967–69, which saw the following three important milestones.² Firstly, the British announced that they would withdraw from Australia's near region.³ Following the fall of Singapore in 1942, Australian policymakers had already turned attention away from the British and towards the US for protection; nevertheless, this raised initial concerns about the requirement to defend Australia independently.⁴ Secondly, in the context of these concerns, the 1968 Strategic Basis Paper (1968 SBP) stated that 'we have recognised that we must be prepared to deal *independently* with any situation which directly threatens Australia's territorial interests.'⁵ Indeed, based on a search of all defence strategic guidance over 1945–1976, as compiled by Stephan Fröling, the first occurrence

² Rebecca Strating and Joanne Wallis, *Girt by Sea: Re-Imagining Australia's Security* (Collingwood, Australia: Black Inc., 2024), 19.

³ Strating and Wallis, 19.

⁴ Stewart Firth, *Australia in International Politics: An Introduction to Australian Foreign Policy*, 3rd ed. (Sydney: Taylor & Francis Group, 2011), 11.

⁵ Department of Defence, *Strategic Basis of Australian Defence Policy—1968*, para. 6, in Stephan Fröling, ed.,

A History of Australian Strategic Policy since 1945 (Canberra: Defence Publishing Service, 2009), 339–90. Emphasis added.

of the term self-reliance was in the 1968 SBP.⁶ In this context, self-reliance was juxtaposed with the importance of alliances in an environment of needing to maintain ongoing equipment compatibility.⁷ Consequently, self-reliance did not mean foregoing alliances, but it did emphasise the need for a greater ability to conduct operations unilaterally. Thirdly, President Nixon made remarks in Guam that became known as the Guam Doctrine.⁸ In 1969, he stated that, while the US would honour its alliance commitments in the Asian region, he expected that allies would become increasingly *independent* in territorial defence, 'except for the threat of a major power involving nuclear weapons.'⁹ Based on the context in which the term self-reliance first appears, and especially noting the Guam Doctrine, the initial usage of the term self-reliance alludes to the ability of the ADF to defend Australia independent of an alliance, should this be required.¹⁰ However, the alliance was not set aside with such a policy, and the two terms were reconciled in the 1970s.¹¹

Self-reliance in DoA

Following its genesis, self-reliance came to mean the ability of the ADF to defend Australia from low-to-medium level threats, with the alliance being relied upon to defeat a major attack. Developing out of further classified policy papers in the early 1970s, the concept of self-reliance was first articulated publicly in the 1976 white paper, which devoted six paragraphs to the subject.¹² While not explicitly defined in this white paper, self-reliance in this context was that Australia had the responsibility for deterring major threats but with confidence in the US's ability to support a response to aggression, and also that it should expect to handle lower level contingencies independently.¹³ This was in appreciation of Australia's geographical position and low likelihood of a major conventional attack being launched against it.¹⁴ Into the 1980s, the 1987 white paper built upon the concepts of self-reliance extensively. On the policy of self-reliance, it states that:

Australia must have the military capability to prevent an enemy from attacking us successfully in our sea and air approaches, gaining a foothold on our territory, or extracting political concessions from us through the use of military force. These are uniquely Australian interests and Australia must have the independent military capability to defend them.¹⁵

Essentially, self-reliance meant unilaterally preventing any credible attack on Australia

⁶ Frühling, *A History of Australian Strategic Policy since 1945*, 386.

⁷ Department of Defence, *Strategic Basis of Australian Defence Policy—1968*, para. 221; in Frühling, *A History of Australian Strategic Policy since 1945*, 339–90.

⁸ Strating and Wallis, *Girt by Sea*, 19.

⁹ Richard Nixon, "Informal Remarks in Guam with Newsmen," in *Public Papers of the Presidents of the United States: Richard Nixon (1969)*, ed. Dorothy H Chance and Peter J. Haley (Washington, D.C.: United States Government Printing Office, 1971), 549. Emphasis added.

¹⁰ Nicole Brangwin et al., *Defending Australia: A History of Australia's Defence White Papers*, Parliamentary Library Research Paper (Canberra: Department of Parliamentary Services, 2015), 9

¹¹ Strating and Wallis, *Girt by Sea*, 19.

¹² Department of Defence, *Australian Defence* (Canberra: Australian Government Publishing Services, 1976), 10–11.

¹³ Department of Defence, 10.

¹⁴ Sir Arthur Tange and Peter Edwards, *Defence Policy-Making: A Close-Up View, 1950-1980: A Personal Memoir* (ANU Press, 2008), 108, https://doi.org/10.26530/OAPEN_458938.

¹⁵ Department of Defence, *The Defence of Australia* (Canberra: Australian Government Publishing Service, 1987), 1.

or its sea or air lines of communication.¹⁶ Nevertheless, the 1987 white paper states that 'this policy of defence self-reliance is pursued within a framework of alliances and agreements. The most significant of these is with the United States.'¹⁷ Importantly, it reinforces the 1976 position that the Australia-US alliance would be relied upon in the event of a major attack.¹⁸ Ultimately, despite not subordinating the Australia-US alliance, these first two defence white papers set the scene for the official defence policy of self-reliance as meaning the ability of the ADF to defend Australia independently.

From the 1990s and up to the release of the DSR, self-reliance remained a common theme in defence policy documents and was applied in a similar vein to the 1970s and 1980s. White papers were released in 1994, 2000, 2009, 2013 and 2016, as well as the Defence Strategic Update (DSU) in 2020, where the concept remained a common thread.¹⁹ For example, the 1994 white paper stated clearly that 'the foundation of the Government's defence policy is self-reliance, which requires that Australia maintain the military capabilities to defend our country without depending on help from other countries' combat forces.'²⁰ This sentiment is echoed in the 2000, 2009, 2013 and 2016 iterations of the white paper, and the DSU²¹ Consistent with the Guam Doctrine, each of these policy documents highlights one notable exception to self-reliance as being the nuclear deterrence umbrella afforded by the US as part of the alliance.²² Professor Stephan Frühling affirms this prevailing narrative of self-reliance meaning defence of the continent without relying on allies' combat forces, and links it with the concept of DoA as both concepts arose out of post-Vietnam War policymaking.²³ He adds that both concepts were 'used to make arguments about the necessary size, sophistication and readiness of the ADF, and contained a strategy of how the ADF could be used to secure the

¹⁶ Brangwin et al., *Defending Australia: A History of Australia's Defence White Papers*, 20; Department of Defence, *The Defence of Australia*, vii–x.

¹⁷ Department of Defence, *The Defence of Australia*, 1.

¹⁸ Department of Defence, 4–5.

¹⁹ Brangwin et al., *Defending Australia: A History of Australia's Defence White Papers*, 24; Department of Defence, *2016 Defence White Paper* (Canberra: Commonwealth of Australia, 2016), 33, 71; Department of Defence, *2020 Defence Strategic Update* (Canberra: Commonwealth of Australia, 2020), 25, 27, 33, 40.

However, the term self-reliance was not used in the 2003, 2005 and 2007 Defence Updates. See Brangwin et al., 24–66.

²⁰ Department of Defence, *Defending Australia* (Canberra: Australian Government Publishing Service, 1994), 13.

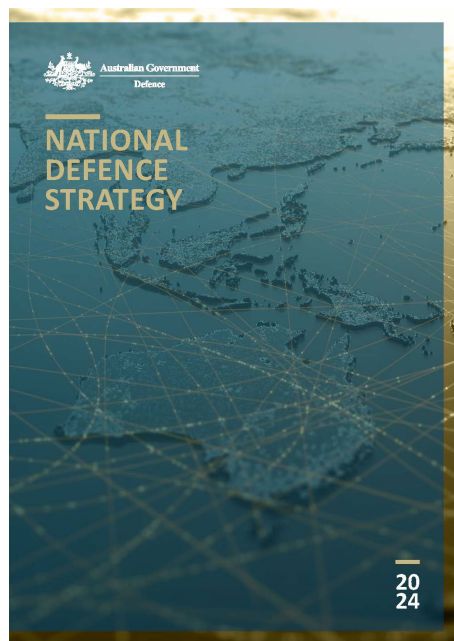
²¹ Department of Defence, *Defence 2000: Our Future Defence Force* (Canberra: Commonwealth of Australia, 2000), 46; Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030 : Defence White Paper 2009* (Canberra: Commonwealth of Australia, 2009), 12; Department of Defence, *Defence White Paper 2013* (Canberra: Commonwealth of Australia, 2013), 28; Department of Defence, *2016 Defence White Paper*, 33; Department of Defence, *2020 Defence Strategic Update*, 40

²² Department of Defence, *Defending Australia*, 96; Department of Defence, *Defence 2000: Our Future Defence Force*, 36; Department of Defence, *Defending Australia in the Asia Pacific Century*, 50; Department of Defence, *Defence White Paper 2013*, 29; Department of Defence, *2016 Defence White Paper*, 121; Department of Defence, *2020 Defence Strategic Update*, 27.

²³ Stephan Frühling, "Australian Defence Policy and the Concept of Self-Reliance," *Australian Journal of International Affairs* 68, no. 5 (October 20, 2014): 533, <https://doi.org/10.1080/10357718.2014.899310>.

country.²⁴ Importantly, 'self-reliance never meant self-sufficiency.'²⁵ That is, a self-reliant force would still rely on 'allied intelligence, logistics and other support.'²⁶ Therefore, considering what was meant by the concept of self-reliance, it is important to understand what it might mean now in national defence policy.

Self-reliance in national defence



The DSR and NDS have retained the term self-reliance, albeit less frequently than previous policy documents; however, most of its use since the DSU has been tied to strengthening domestic industry. Notably, the DoA doctrine was last affirmed in the 2016 white paper, but the self-reliance concept has remained.²⁷ Self-reliance is directly referred to six times in the DSU, including referring to ideas such as 'strengthened sovereign industry, ... [reducing] dependencies on partners for critical capability, ... [increasing] the range and quantity of the weapon stocks [Defence] holds, ... [and building] Australia's self-reliant geospatial- information and intelligence capability.'²⁸ These ideas appear somewhat contrary to the previous policy that self-reliance does not mean logistical or intelligence self-sufficiency. Moreover, the DSR affirmed that the DoA doctrine is not appropriate anymore, and the NDS officially replaced the doctrine with national defence.²⁹

Nevertheless, the DSR and NDS each refer to self-reliance four times and appear to build upon the DSU's foundation in moving towards industrial self-reliance, albeit not necessarily total industrial self-reliance. Of the eight references to self-reliance across the DSR and NDS, six relate directly to logistics or domestic industry.³⁰ For example, the DSR states regarding naval shipbuilding capability that 'creating and sustaining this industrial capability, including the underpinning workforce, is a critical component of self-reliance in national defence.'³¹ However, the NDS states awkwardly that 'a sovereign defence industrial base is not one characterised

²⁴ Stephan Frühling, "The 2013 Defence White Paper: Strategic Guidance Without Strategy," *Security Challenges* 9, no. 2 (2013): 44, <http://www.jstor.org/stable/26462913>.

²⁵ Paul Dibb, "The Self-Reliant Defence of Australia: The History of an Idea," in *History as Policy: Framing the Debate on the Future of Australia's Defence Policy*, ed. Ron Huisken and Meredith Thatcher, 1st ed., vol. 1, Canberra Papers on Strategy and Defence (Canberra: ANU E Press, 2007), 12, <https://doi.org/10.22459/HP.12.2007.01>.

²⁶ Frühling, "Australian Defence Policy and the Concept of Self-Reliance," 536.

²⁷ Department of Defence, *2016 Defence White Paper*, 33; Department of Defence, *2020 Defence Strategic Update*, 25, 27, 33, 40.

²⁸ Department of Defence, *2020 Defence Strategic Update*, 33, 40.

²⁹ Australian Government, National Defence: Defence Strategic Review, 32; Department of Defence, National Defence Strategy, 17.

³⁰ Australian Government, *National Defence: Defence Strategic Review*, 78, 81; Department of Defence, National Defence Strategy, 43, 57.

³¹ Australian Government, National Defence: Defence Strategic Review, 78.

by *complete* self-reliance, but is rather underpinned by industrial capability resident in Australia that, if necessary, can effectively leverage international defence industry to deliver defence capabilities in the timeframes required.’³² This is awkward as it presumes that self-reliance can exist without being complete, and this statement somewhat undermines the strengths of the other assertions on self-reliance. Finally, consistent with earlier policies, two of the eight references to self-reliance appear to allude to the ADF’s ability to defend Australia independently. An example is where the NDS states that ‘the Government is determined to ensure that Australia becomes more capable, *self-reliant* and takes greater responsibility for *its own security*.’³³ Ultimately, the weight of references to self-reliance in the DSR and NDS appears to be signalling a shift in the usage of the term self-reliance away from the ability of the ADF to defend Australia independently to the ability of domestic industry to support the ADF.

Summary and hypotheses

Overall, the concept of self-reliance in the DoA context held a relatively consistent meaning from its conception in the 1960s through to the final use of the DoA concept in the 2016 white paper; that is, that self-reliance means the ADF’s ability to defend Australia independently. Although DoA has been replaced with national defence, some usages of the term self-reliance in the DSR and NDS appear consistent with this initial conception. This leads to the first of two hypotheses (**H1**) for what self-reliance in national defence might mean in parliamentary discourse:

H1: Self-reliance in national defence means the ability of the ADF to defend Australia independently.

However, most of the use of self-reliance in national defence policy via the DSR and NDS is heavily focused on domestic industry and alludes to an industry-focussed definition of self-reliance; that is, that self-reliance means domestic industry’s ability to support the ADF. This leads to the second of two hypotheses (**H2**):

H2: Self-reliance in national defence means the ability of domestic industry to support the ADF.

These hypotheses are not mutually exclusive but provide the framework through which parliamentary discourse is tested in the remainder of the paper to establish what politicians and senior leaders mean by self-reliance in the national defence era.

Data and methodology

In this section, this paper discusses the sources of data used for the research and the methods used in processing and analysing the data. In doing so, this section identifies both my self-imposed research limits designed to constrain the paper’s scope to the key topics under consideration while acknowledging some effects of these limitations. It also addresses potential areas for bias and how these have been mitigated.

This paper uses records of recent parliamentary proceedings as the source data for understanding the Australian Government’s approach towards self-reliance and its interrelatedness with the national defence concept. I sourced the records directly from the official Australian Parliament House website at ‘aph.gov.au.’ Records were selected

³² Department of Defence, *National Defence Strategy*, 57. Emphasis added.

³³ Department of Defence, 17. Emphasis added.

from the timeframe of 01 April 2023 through to 30 September 2024 to limit the scope of the research to an 18-month period. Importantly, the start month and year were based on the release date of the DSR and the end date was only limited by the time of writing, allowing for the most contemporaneous records to be used. Moreover, the parliamentary proceedings used include the full series of Hansard from both the House of Representatives and the Senate, as well as the Senate Estimates from the Foreign Affairs, Defence and Trade Legislation Committee. This committee was selected for its direct relevance to defence-related matters. In total, the parliamentary records used include 95 editions of Hansard from the House of Representatives, 86 from the Senate, and 14 from the Senate Estimates Committee.³⁴ Therefore, this research is based on 195 records which were subjected to analysis as described below.

All 195 records were imported into the software application NVivo 14 for analysis. I then used a mixed methods approach that included an initial quantitative analysis of the full selection of materials, followed by a qualitative analysis of the results. The purpose of the quantitative analysis was to determine how frequently selected terms appeared in the records to produce a numerical output, whereas the qualitative analysis was about understanding and interpreting the text to identify key themes present in the discourse.³⁵ Both methods were used to mitigate potential selection bias on my part by starting with such a large sample size for the quantitative analysis before conducting a more detailed qualitative analysis. This was also to avoid a lengthy exposition of less relevant parts of the parliamentary discourse.

Starting with the quantitative analysis, I ran two text search queries for key terms related to this research to identify relevant matches from the whole selection of materials. The first query ran was for the noun phrase 'national defence.' Additionally, the second query ran was for the compound nouns 'self-reliance' and 'self-reliant' using the Boolean operator 'OR' to capture both spelling variants. I then reviewed each match from the two queries in order to exclude results that were not in the context of the core topic of this paper, such as a reference to the size of the defence budget in debates about the cost of superannuation tax concessions to government revenue.³⁶ The results of these queries are discussed in the next section and form the basis of the qualitative analysis. Various other text search queries were also run to identify potentially missed results, such as with cognate words or other variations, with nothing significant identified from an initial scan of the results.³⁷ A deeper analysis of these other queries was beyond the self-imposed research limits.

Moving onto the qualitative analysis, the results of the queries were reviewed in detail to identify key themes present. Initially, I used each match to produce a series of extracts from the respective Hansards that included the entire context in which the search term was found. Subsequently, I coded each extract in NVivo 14 according to the primary topic

³⁴ It is noted that, at the time of writing, official versions of the Hansard and Committee Hansard are only available up to the end of March 2024. Proof copies have been used for the more recent proceedings. Therefore, there may be some minor amendments to these records prior to their official release.

³⁵ Saul McLeod, "Qualitative vs Quantitative Research: Methods and Data Analysis," *Simple Psychology* (blog), December 18, 2023, <https://www.simplypsychology.org/qualitative-quantitative.html>.

³⁶ Commonwealth of Australia, *Parliamentary Debates*, Senate, 30 November 2023, 6334 (Tammy Tyrrell).

³⁷ An example alternate query that was run but discarded was 'reliance' to identify where the term reliance has been used without the prefix 'self-'. This produced a further 205 references, none of which added to the value of this paper.

under discussion, such as domestic industry or capability procurements. A level of subjectivity was required here on my part to classify each extract according to broad themes. This subjectivity was mitigated by reading the entirety of the surrounding discourse to gauge an understanding of the whole context. These thematic classifications are summarised in the next section. Finally, of all the coded material, I identified key extracts that relate most directly to the hypotheses above, especially any extracts that included coding for both national defence and self-reliance. These are discussed in the final section and tested against the hypotheses.

Overall, the data used for this research have been limited to recent Hansards of the House of Representatives, Senate and the defence-related component of the Senate Estimates committee. A quantitative analysis was conducted of key concepts throughout all records, with a qualitative analysis applied to the extracted records to identify key themes. These findings are discussed in the next section with key, selected materials applied in the subsequent section as part of a discourse analysis as they relate to the hypotheses identified in the policy and literature review.

Research findings

In this section, this paper discusses the findings of the quantitative and qualitative analyses described in the previous section. It identifies domestic industry as the most common theme in the discourse on national defence and self-reliance, with capability procurements as another prominent theme. Finally, it also identifies key Hansard extracts to be discussed further in the next section.

After excluding results that were out of context, the query on the topic of national defence returned 41 matches. Two of the 41 matches appeared in close proximity to an earlier match, resulting in 39 extracts for qualitative analysis. Within the 39 extracts, four key themes were identified: domestic industry, capability procurements, the federal budget, and a proposed Parliamentary Joint Committee on Defence (PJCD). The number of times each theme was identified as the primary theme in an extract was calculated; this is summarised in table 1 below. Importantly, four extracts were equally focussed on both domestic industry and capability procurements, so these have been coded to both themes; hence, the number of occurrences listed in the table would total 43, even though there are only 39 extracts. These results indicate that both domestic industry and capability procurements are the top two themes in the parliamentary discourse on the national defence topic. Domestic industry received slightly more attention than capability procurements, with three more extracts than the other.

Table 1. Number of matches by theme in Hansard extracts on the topic of national defence

Theme	Occurrences
Domestic industry	15
Capability procurements	12
Proposed PJCD	9
Federal budget	7

The query on the topic of self-reliance returned 26 matches, also after excluding

irrelevant results. Six of the 26 matches appeared in close proximity to an earlier match, resulting in 20 extracts for qualitative analysis. Within the 20 extracts, two key themes were identified, both of which were the top two themes in the previous query: domestic industry and capability procurements. As per the national defence query, the number of times each theme was identified as the primary theme in an extract was calculated, and this is summarised in table 2 below. Significantly, these results indicate that the usage of the term self-reliance in contemporary political discourse relates overwhelmingly to domestic industry rather than capability procurements, with 18 extracts coded to domestic industry compared with two coded to capability procurements. Moreover, nine out of the 18 extracts on domestic industry spoke specifically about defence. However, the results concerning capability procurements do provide a perspective that relates to the ability of the ADF to defend Australia independently, and these are explored in the next section.

Table 2. Number of matches by theme in Hansard extracts on the topic of self-reliance

Theme	Occurrences
Domestic industry	18
Capability procurements	2

Noting the large number of extracts produced from the preceding analyses, it is important to identify some key extracts to take forward to further discussion. Although 39 extracts were coded to national defence and 20 were coded to self-reliance, there were only 57 extracts in total. This is because two extracts were coded to both concepts, meaning that the terms national defence and self-reliance appeared in the same extract. Therefore, these are the first two extracts that will be discussed in the next section due to the high coding density. Moreover, a further five extracts have been identified by their content as most directly relating to the hypotheses. It is acknowledged that the remaining 50 extracts do have value; however, I assert that none of these undermines the forthcoming arguments, and for the sake of efficiency, further discussion on these is not necessary.

Overall, this section has identified domestic industry and capability procurements as the two key themes surrounding parliamentary discourse on the national defence doctrine. Additionally, most of the discourse on the concept of self-reliance relates exclusively to domestic industry. Of the 57 extracts produced, I have selected the seven most relevant extracts to take forward to further discussion in the next section.

Discussion

In this section, this paper reviews the findings above to demonstrate which hypotheses have been proven or disproven from the quantitative and qualitative analysis. The findings show little support for **H1**, which is that self-reliance in national defence means the ability of the ADF to defend Australia independently. Conversely, they show some strong support for **H2**, which is that self-reliance means the ability of domestic industry to support the ADF. The section discusses key extracts from the parliamentary discourse to reinforce these findings.

The research findings demonstrate that discussions around domestic industry prevail as the key themes in analysing the concepts of both national defence and self-reliance, with discussion strongest in percentage terms in the context of self-reliance. Returning to the hypotheses, the initial findings affirm **H2** in queries on both national defence and self-reliance because themes surrounding domestic industry were most common on both

fronts. This is reinforced by analyses of two key extracts below. **H2** is limited definitionally but not disproven by a third extract, also discussed below. Furthermore, the researcher found nil direct thematic support for **H1**. That said, a series of extracts on capability procurements may imply support for **H1**; however, the majority of these extracts only reference national defence, not self-reliance. The two extracts in this series that do reference self-reliance provide a contrarian view to argue that national defence lessens self-reliance as defined by **H1**. This series of extracts is the last to be discussed herein.

The first key extract to be discussed debates the NDS and links the concept of self-reliance directly to domestic defence industry. Speaking in Senate debates on matters of public importance on 13 August 2024, independent Senator David Van submitted the motion that 'Australia's sovereign defence manufacturing industry must be sufficiently funded so that Australia has the capability to fight.'³⁸ In discussing this motion, Senator Van quotes the NDS's



calls for 'a sovereign defence industrial base' as critical for achieving defence self-reliance.³⁹ He expressed concern that the Australian Government was not allocating sufficient financial resources to domestic manufacturers that can produce many of the capabilities the ADF needs. Importantly, Senator Van's motion was supported by senators from five political parties.⁴⁰ While none of their responses directly mentioned self-reliance, each senator spoke at length about the importance of a strong defence industry to achieving national security. This indicates that, across a spectrum of political parties and independents, domestic defence industry is now considered to be an essential support to the ADF. Senator Raff Ciccone, Australian Labor Party (ALP), did not directly support the motion itself, but he did rise to contribute.⁴¹ Although he also did not mention the term self-reliance, he directly linked the importance of a strong sovereign defence industry to the ability of the ADF to defend the country, and he did so by highlighting increases in defence spending on domestically-produced capabilities, such as munitions manufacturing.⁴² As with the other senators, this alludes to the importance of domestic defence industry to military self-reliance, and he only drew a second-order link to the ability of the ADF to defend Australia, with no reference to independent defence. Ultimately, the context here further demonstrates direct support for **H2** and provides only limited indirect support for **H1**.

The second key extract to be discussed also links the concept of self-reliance in domestic industry to the NDS. Mr Phillip Thompson OAM MP, Liberal National Party of Queensland, had raised a similar motion to Senator Van's, calling upon the Government to 'urgently implement a policy framework and industry support to build our industrial self-

³⁸ Commonwealth of Australia, *Parliamentary Debates*, Senate, 13 August 2024, 43 (Andrew Bragg quoting David Van).

³⁹ Commonwealth of Australia, 43 (David Van).

⁴⁰ Commonwealth of Australia, 43–47.

⁴¹ Commonwealth of Australia, 45 (Raff Ciccone).

⁴² Commonwealth of Australia, 45–46 (Raff Ciccone).

reliance with Australian defence industry primes.⁴³ In her response, Ms Tania Lawrence MP, ALP, directly linked industrial self-reliance to the DSR and NDS.⁴⁴ Following on from comments about the DSR, she linked present-day, complex security challenges in the Australian region to the Government's plan to create a 'robust sovereign and economically significant defence industry in Australia.'⁴⁵ A further seven members of parliament from both the Government and the Opposition debated the motion, and all placed a strong emphasis on the need for a strong domestic defence industry to enable the ADF.⁴⁶ Therefore, it is clear from this debate that domestic defence industry is seen as a critical component of self-reliance in the national defence era, also supporting **H2** and providing no evidence to support **H1**.

The above two extracts are limited slightly by a third extract, which, like the philosophy of self-reliance in the DoA era, limits self-reliance to not meaning *complete* self-reliance, though remaining on the topic of domestic industry. Speaking at Senate Estimates, Mr Tom Hamilton, Deputy Secretary DSR Implementation Taskforce, stated that developing the sovereign industrial base is not about achieving complete self-reliance but an industry that supports national defence directly and that can leverage links with international firms to meet Defence capability requirements.⁴⁷ In response, Senator Van observed that any future conflict in Australia's near region would threaten its sea lines of communication, in which case the country would be completely reliant on domestic industry to sustain any Australian involvement.⁴⁸ Therefore, the concept of self-reliance in parliamentary discourse concedes that self-reliance is not total in the national defence concept, comparable with how its usage was limited in the DoA era. However, the focus of self-reliance in this context remains oriented towards domestic industry, as per the previous extract, rather than the ability of the ADF to defend Australia independently, as per its usage in the previous era. Therefore, the third extract maintains support for **H2** but limits the scope of what self-reliance means.

Finally, a series of four extracts demonstrates that the procurement of ADF capabilities to defend the continent is a critical component of national defence; however, importantly, the limited usages of the term self-reliance in this context imply the Government is no longer applying its previous meaning. On 09 May 2023, speaking following the release of the DSR and concerning the acquisition of nuclear-powered submarines under the AUKUS⁴⁹ partnership, Senator Ciccone stated that 'there is broad acknowledgement that we cannot entirely rely on other nations to deter conflict in our region. We need to acquire the capabilities necessary to be a serious deterrent in our own right.'⁵⁰ Furthermore, on 19 August 2024, speaking concerning the NDS, Mr Steve Georganas MP, ALP, stated that acquiring these submarines is critical to developing an ADF that can more effectively defend Australia.⁵¹ These two extracts indicate clearly that the ADF's ability to defend Australia independently is a significant component of national defence, but it is important to note that self-reliance was not mentioned. Critically, two extracts from independent Ms

⁴³ Commonwealth of Australia, *Parliamentary Debates*, House of Representatives, 03 June 2024, 169 (Phillip Thompson).

⁴⁴ Commonwealth of Australia, 171 (Tania Lawrence).

⁴⁵ Commonwealth of Australia, 171 (Tania Lawrence).

⁴⁶ Commonwealth of Australia, 171–177.

⁴⁷ Commonwealth of Australia, *Estimates*, Senate: Foreign Affairs, Defence and Trade Legislation Committee, 05 June 2024, 44 (Tom Hamilton).

⁴⁸ Commonwealth of Australia, 44 (David Van).

⁴⁹ Australia, United Kingdom and United States

⁵⁰ Commonwealth of Australia, *Parliamentary Debates*, Senate, 09 May 2023, 1796 (Raff Ciccone).

⁵¹ Commonwealth of Australia, *Parliamentary Debates*, House of Representatives, 19 August 2024, 189 (Steve Georganas).

Zoe Daniel MP argue that the AUKUS partnership *reduces* Australia's self-reliance as envisaged under the DoA concept.⁵² In this context, it is clear that Ms Daniel is using the term self-reliance as proposed under **H1** but is of the view that AUKUS capability procurements are a step away from the ADF's ability to defend Australia independently due to dependence on the US and the United Kingdom. Thus, this series of extracts demonstrates that national defence remains focussed on the ADF's ability to defend Australia, but the ability to do so independently is no longer a concept tied to self-reliance.

Overall, the findings and the selected extracts demonstrate strong support for **H2** and limited support for **H1** because they tie self-reliance directly to the ability of domestic industry to support the ADF rather than the ability of the ADF to defend Australia independently. Consequently, **H2** is confirmed, and **H1** is rejected. Many more extracts could be described further but are not included due to scope limitations. None of these extracts would provide any further rebuttal to assertions regarding either hypothesis. Importantly, the rejection of **H1** does not imply that common usage of the term self-reliance does not mean the use of the ADF to defend Australia; it simply states that, as far as contemporary parliamentary discourse is concerned, the use of the concept of self-reliance in national defence is about the ability of domestic defence industry to support the ADF. There remains, however, a concession that self-reliance is not total and depends on international linkages.

Conclusion

In summary, this paper has reviewed key policy and literature on the concept of self-reliance in the history of Australian defence policy. In its conception, self-reliance meant the ability of the ADF to defend Australia independently from any support provided by the Australia-US alliance. The Australia-US alliance remained complimentary to the concept of self-reliance, with US support relied upon only in circumstances beyond the ADF's capacity, such as nuclear deterrence. Moreover, the term self-reliance was tied directly to the DoA doctrine and formed the basis of the first hypothesis. Importantly, since the birth of the national defence doctrine, which replaced the DoA, self-reliance within an alliance framework has remained a supporting concept. However, references to self-reliance in the DSR and NDS appear to emphasise the ability of domestic industry to support the ADF rather than the ADF's ability to defend Australia independently. This formed the basis of the second hypothesis. Both hypotheses were tested against the present usage of the terms national defence and self-reliance in parliamentary discourse to ascertain what policymakers mean by self-reliance in the national defence era.

The research findings indicate clearly that the majority of parliamentary discourse on self-reliance and national defence relates to domestic industry, and this represents a departure from the self-reliant DoA concept. This does not mean that national defence does not seek, in general, to generate an ADF capable of defending Australia independently; it simply means that the use of the term self-reliance has shifted focus and is now oriented towards industrial self-reliance in contemporary parliamentary discourse. Therefore, as far as this discourse is concerned, *self-reliance in national defence means the ability of domestic industry to support the ADF*. However, it is conceded in the discourse that Australia could not be completely self-reliant, but this concession does not undermine the proven hypothesis.

Moving forward, with the changing use of the term self-reliance, it is questioned whether

⁵² Commonwealth of Australia, *Parliamentary Debates*, House of Representatives, 01 July 2024, 41 (Zoe Daniel); Commonwealth of Australia, *Parliamentary Debates*, House of Representatives, 11 September 2024, 135–36 (Zoe Daniel).

such a term remains relevant in Australian defence policy due to potential ambiguities and whether a better concept should be found. Such ambiguities may be problematic in the practical application of defence policy when interlocutors hold different ideas about what basic concepts mean, and this may impair the development of a cohesive strategy. As the national defence doctrine matures, further research is recommended into how these ambiguities are addressed at a practical level and whether there are any unintended consequences of the ambiguity, such as policy implications. If Australian policymakers truly seek self-reliance, then they need both a self-reliant ADF and a self-reliant domestic industry. If not, then it may be time for policymakers to discard the concept of self-reliance and say what they really mean.

References

Australian Government. *National Defence: Defence Strategic Review*. Canberra: Commonwealth of Australia, 2023.

Brangwin, Nicole, Nathan Church, Steve Dyer, and David Watt. *Defending Australia: A History of Australia's Defence White Papers*. Parliamentary Library Research Paper. Canberra: Department of Parliamentary Services, 2015.

Commonwealth of Australia. *Estimates*. Senate: Foreign Affairs, Defence and Trade Legislation Committee, 05 June 2024.

———. *Parliamentary Debates*. House of Representatives, 03 June 2024.

———. *Parliamentary Debates*. House of Representatives, 01 July 2024.

———. *Parliamentary Debates*. House of Representatives, 19 August 2024.

———. *Parliamentary Debates*. House of Representatives, 11 September 2024.

———. *Parliamentary Debates*. Senate, 09 May 2023.

———. *Parliamentary Debates*. Senate, 30 November 2023.

———. *Parliamentary Debates*. Senate, 13 August 2024.

Department of Defence. *2016 Defence White Paper*. Canberra: Commonwealth of Australia, 2016.

———. *2020 Defence Strategic Update*. Canberra: Commonwealth of Australia, 2020.

———. *Australian Defence*. Canberra: Australian Government Publishing Services, 1976.

———. *Defence 2000: Our Future Defence Force*. Canberra: Commonwealth of Australia, 2000.

———. *Defence White Paper 2013*. Canberra: Commonwealth of Australia, 2013.

———. *Defending Australia*. Canberra: Australian Government Publishing Service, 1994.

———. *Defending Australia in the Asia Pacific Century: Force 2030 : Defence White Paper 2009*. Canberra: Commonwealth of Australia, 2009.

———. *National Defence Strategy*. Canberra: Commonwealth of Australia, 2024.

———. *Strategic Basis of Australian Defence Policy—1968*, in Frühling (ed.), *A History of Australian Strategic Policy Since 1945*, Canberra: Defence Publishing Service, 2009.

———. *The Defence of Australia*. Canberra: Australian Government Publishing Service,

1987.

Dibb, Paul. "The Self-Reliant Defence of Australia: The History of an Idea." In *History as Policy: Framing the Debate on the Future of Australia's Defence Policy*, edited by Ron Huiskens and Meredith Thatcher, 1st ed., 1:11–26. Canberra Papers on Strategy and Defence. Canberra: ANU E Press, 2007. <https://doi.org/10.22459/HP.12.2007.01>.

Firth, Stewart. *Australia in International Politics: An Introduction to Australian Foreign Policy*. 3rd ed. Sydney: Taylor & Francis Group, 2011.

Frühling, Stephan, ed. *A History of Australian Strategic Policy since 1945*. Canberra: Defence Publishing Service, 2009.

———. "Australian Defence Policy and the Concept of Self-Reliance." *Australian Journal of International Affairs* 68, no. 5 (October 20, 2014): 531–47. <https://doi.org/10.1080/10357718.2014.899310>.

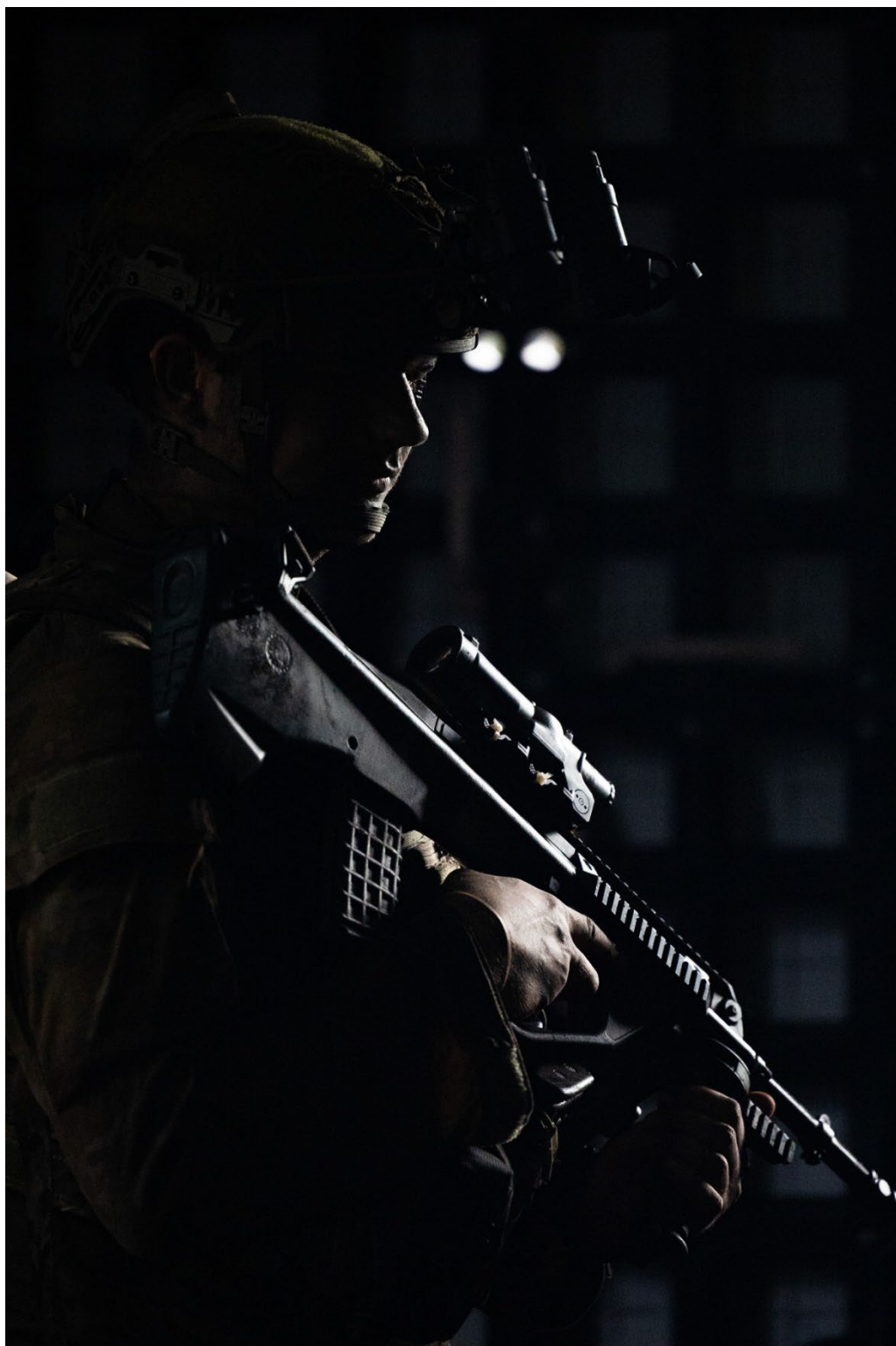
———. "The 2013 Defence White Paper: Strategic Guidance Without Strategy." *Security Challenges* 9, no. 2 (2013): 43–50. <http://www.jstor.org/stable/26462913>.

McLeod, Saul. "Qualitative vs Quantitative Research: Methods and Data Analysis." *Simple Psychology* (blog), December 18, 2023. <https://www.simplypsychology.org/qualitative-quantitative.html>.

Nixon, Richard. "Informal Remarks in Guam with Newsmen." In *Public Papers of the Presidents of the United States: Richard Nixon (1969)*, edited by Dorothy H Chance and Peter J. Haley. Washington, D.C.: United States Government Printing Office, 1971.

Strating, Rebecca, and Joanne Wallis. *Girt by Sea: Re-Imagining Australia's Security*. Collingwood, Australia: Black Inc., 2024.

Tange, Arthur Sir, and Peter Edwards. *Defence Policy-Making: A Close-Up View, 1950-1980: A Personal Memoir*. ANU Press, 2008. https://doi.org/10.26530/OAPEN_458938.



To what extent is memetic warfare applicable to the Australian Defence Force?

Wing Commander Paul Strack

Wing Commander Paul Strack is an Armament Engineer and graduate of the Australian Command and Staff Course class of 2024. He is currently posted to Canberra where he is working on Australia's future sovereign rocket motor production capability

Introduction

Part of the difficulty with researching memes is that there is no universally accepted definition of what a meme is. Many research papers, including this one, will begin by acknowledging that the term meme was coined in 1976 by Richard Dawkins in his book "The Selfish Gene". Dawkins took the Greek word for imitation, 'Mimeme', and modified it to rhyme with 'gene' which he used as an analogy for how memes replicate. Dawkins used the term meme to describe a type of replicator that works within the domain of human culture, propagating itself by spreading from one brain to another. He defined meme as a "unit of cultural transmission, or a unit of imitation."¹ Dawkins proposed that memes can be ideas, clothes, fashion, music, ideas, catch-phrases or ways of doing things like baking bread or building a house. Dawkins drew on his analogy for 'gene complexes' which are made up of different size genetic units, to propose the idea of 'meme complexes' which are made up of different sized memes. For example, a song might be a meme, but if a smaller part of that song can be abstracted and be distinctive and memorable by itself, it could also be described as a meme. A religion could also be thought of as a meme complex, comprising many smaller memes such as the ideas of God, or hell.

This research paper will examine the extent to which memetic warfare is applicable to the Australian Defence Force (ADF). The study of military memetics reaches as far back as 1996 and possibly earlier; however, a review of existing literature was unable to yield any papers specifically considering the role of memetic warfare in the context of the ADF. As potentially the first ADF-specific research on memetics, this paper will provide a comprehensive history of military memetics and seek to prompt future ADF discussion and research in this field. Historical military memetics research has offered bold proposals such as the creation of meme warfare units within organisations such as the United States military, none of which have come to fruition. This paper will highlight that memetics is not a panacea to warfare in the Information Domain, but could serve as a useful framework for approaching the narrative and cognitive aspects of Information warfare. Future ADF research in memetics should be pragmatic and not fall into the same faddish traps that military memetics has succumbed to in the past.

In terms of research methodology, this paper will utilise case study analysis to identify

¹ Richard Dawkins, *The Selfish Gene : 40th Anniversary Edition*, 40th anniversary edition, Oxford Landmark Science (Oxford: OUP Oxford, 2016), 249.

the applicability of memetic warfare to the ADF.² This method has been chosen as there is no universally accepted definition or theory of memetics, which makes quantitative research methods difficult. Case study analysis allows a flexible and pragmatic approach to be taken when assessing the applicability of the ill-defined field of memetic warfare to the ADF. An 'inclusive' definition of memes will be utilised for the case study, whereby meme can be taken as any type of information that can be copied through imitation as a meme.³

The case study chosen is the current conflict between Ukraine and Russia arising from Russia's invasion of Ukraine in 2022. The case study demonstrates that memetic warfare is an active component in a contemporary conflict and will almost certainly be a component in a future Indo-Pacific conflict. Of particular note in the Russia-Ukraine conflict is the significance of the civilian online resistance movement, the North Atlantic Fellas Organisation (NAFO), with their primary utility being in countering Russian disinformation. The ADF must consider how it will interact with online civic resistance organisations such as NAFO, and what role, if any, the ADF chooses to participate in the memetic warfare component of future conflict. This paper will highlight that 'higher level' memes may have played a role in Putin's decision to invade Ukraine, and it would therefore be useful for the ADF to understand what kind of memes exist within ADF decision-makers and what memes about the ADF exist in the minds of those outside the ADF.

Memetics History and Frameworks

The formal study of memes is referred to as memetics which is defined as "the theoretical and empirical science that studies the replication, spread and evolution of memes."⁴ Whilst Dawkins may have coined the term meme, others have proposed different terms to describe cultural units that replicate. For example, 'culturgen', 'symbol', 'culture-type', 'theme' and 'mnemon' have all been put forward, although the precise meaning of those terms is debated.⁵ The term meme has been used to describe world views, traditions, phrases of music, economic systems, phenotypic traits, self-awareness, neural structures and cultural artefacts.⁶ To add to the confusion, some believe that memes control behaviour, whilst others believe that memes are acquired through choice.⁷ The confusion in definition and scope is not unsurprising given the span of academic disciplines that have equities in the meme concept. For example, memetics spans disciplines including but not limited to Psychology, Anthropology, Behavioural Studies, Neuroscience, Computer Science, Philosophy, Archaeology, Biology, Marketing and Systems engineering, each with their own language and frameworks.⁸ The inability to

² Health Liaison Librarians, "LibGuides: Qualitative Study Design: Case Studies," accessed October 10, 2024, <https://deakin.libguides.com/qualitative-study-designs/case-studies>.

³ L. Shifman, "Memes in a Digital World: Reconciling with a Conceptual Troublemaker," *Journal of Computer-Mediated Communication* 18, no. 3 (January 1, 2013): 367, <https://doi.org/10.1111/jcc4.12013>.

⁴ Shifman, 363.

⁵ Michael L. Best, "Memes on Memes -- a Critique of Memetic Models.," *Journal of Memetics - Evolutionary Models of Information Transmission* 2, no. 1 (June 1, 1998): 1.

⁶ John S. Wilkins, "What's in a Meme?," *Journal of Memetics - Evolutionary Models of Information Transmission* 2, no. 1 (June 1, 1998): 56.

⁷ Wilkins.

⁸ Robert Aunger, "A Report on the 'conference Do Memes Account for Culture?' Held at King's College, Cambridge.," *Journal of Memetics - Evolutionary Models of Information Transmission* 3, no. 2 (December 1, 1999): 39.

develop a precise definition that enables memes to be recognised and measured has resulted in a lack of empirical studies in the field of memetics. The lack of empirical studies has, in turn, resulted in memetics never attracting the kind of funding from most governments and universities that are enjoyed by established sciences.⁹ This has also likely contributed to the perception of memes by some as a ‘pseudoscience’. Despite the confusion in definitions and the resultant impact on memetics as a discipline, most definitions of meme agree that “a meme is a unit (whatever that means) of cultural transmission/information (whatever that means), where culture may be defined as the total pattern of behaviour (and its products) of a population of agents, embodied in thought, behaviour, and artifacts, and dependent upon the capacity for learning and transmitting knowledge to succeeding generations.”¹⁰

In popular culture, the term meme has a different meaning than what is used within academic discourse on memetics. In the age of the internet, the term ‘internet meme’ or just ‘meme’ is commonly understood to describe “catchy and widely propagated ideas or phenomena.”¹¹ Even more specifically, most internet-memers would understand a meme as “an idea, expression or opinion captured in text or visual material, such as a photo, video or GIF file, mostly accompanied by text or sound, which is copied and distributed online.”¹² The popular understanding of meme tends to bundle both the ‘idea’ and ‘carrier’ under the same term. An important distinction between the academic understanding of memetics and the popular understanding of memes is the longevity of memes. Popular culture would not assign a level of longevity to memes compared to those studying memetics.¹³ For example, the recent performance of Australian Olympian Raygun at the 2024 Olympics became a highly popular internet meme, but the longevity of that meme would not be expected to compare to a meme complex such as a religion if you were to adopt Dawkins’ view of memetics.

Despite the conjecture over definitions, broadly speaking there are three main categories within memetics, mentalist-driven memetics, behavioural driven memetics and inclusive approaches. In mentalist-driven memetics the distinction is made between a meme and a ‘meme vehicle’.¹⁴ The meme itself is the complex idea or information stored within our brain, similar to how a computer stores information. The meme is then ‘loaded’ onto a vehicle such as an image, ritual, text, speech or other artifact which is the tangible or observable expression of the meme.¹⁵ In behavioural-driven memetics, memes are viewed as artifacts and behaviours instead of ideas. In this conceptualisation, there is no distinction between the meme and the meme vehicle. That is, the meme does not exist

⁹ D.K. Dirlam, “Using Memetics to Grow Memetics,” *Journal of Memetics* 9, no. 1 (January 1, 2005), <https://research.ebsco.com/linkprocessor/plink?id=24b1ec95-061b-3a1e-b110-66d67349c109>.

¹⁰ Robert Finkelstein, “Tutorial: Military Memetics,” Tutorial (Social Media for Defense Summit: Robotic Technology Inc., October 24, 2011), 22, <https://www.roboticstechnologyinc.com/images/upload/file/Presentation%20Military%20Memetics%20Tutorial%20Conference%2013%20Dec%2011.pdf>.

¹¹ Michele Knobel and Colin Lankshear, “Online Memes, Affinities, and Cultural Production,” in *A New Literacies Sampler*, 2007, 201.

¹² “Memes as an Online Weapon: An Analysis into the Use of Memes by the Far Right” (National Coordinator for Security and Counterterrorism, May 2024), 1, https://english.nctv.nl/binaries/nctv-en/documenten/publications/2024/08/01/far-right-memes-undermining-and-far-from-recognizable/NCTV_Memes+as+an+online+weapon_English+version+May+2024.pdf.

¹³ Knobel and Lankshear, “Online Memes, Affinities, and Cultural Production,” 1.

¹⁴ Shifman, “Memes in a Digital World: Reconciling with a Conceptual Troublemaker,” 366.

¹⁵ Shifman, 366.

outside of its observable manifestation. This definition allows for the empirical study of memes.¹⁶ A third category is an inclusive approach which essentially classifies any type of information that can be copied through imitation as a meme. Under this approach, a meme could be music, ideas, brain structures that initiate ideas, behaviours that those brain structures produce and so on.¹⁷

Other frameworks used in memetics focus on the properties and utilities of memes rather than the definition of what a meme is. For example, Limor Shifman developed a framework to focus on the ‘memetic dimensions’ associated with memes. These memetic dimensions are content, form and stance. Whilst not analytical in nature, this framework focuses on dimensions of culture that people can imitate and allows categorisation of memes based on these dimensions.¹⁸ Another framework developed by the Center for Naval Analyses (CNA) in their self-initiated exploratory study titled “Exploring the Utility of Memes for U.S. Government Influence Campaigns” identifies three methods by which memes can be utilised to undertake information and influence campaigns.¹⁹ The three methods are ‘inoculate’, ‘infect’ and ‘treat’ and are depicted in Table 1.

	Inoculate	Infect	Treat
Purpose	Prevent or minimize the effect of adversary messaging	Transmit messages in support of USG interests	Contain the effect of adversary messaging
Distribution	<i>Preventative</i> Anticipatory	<i>Offensive</i> Stand Alone Effort	<i>Defensive</i> Reactive
Message Disposition	Adversary	USG	Adversary

Table 3: CNA Innoculate, Infect, Treat framework²⁰

The CNA inoculate, infect, treat framework provides a pragmatic way to view the utility of memes in a military context, whereas Shifman’s framework is more useful for categorising memes to enable an understanding of their structure and cultural meaning. Future ADF research in memetics should consider how the CNA framework could be operationalised within an ADF context.

Military Memetics

It is difficult to pinpoint exactly when the idea of using memes in a military context arose, however the concept of applying memetics to information warfare was discussed in a Janes Special Report titled “The Memetic Warfare Model” by Dr George Stein and Colonel (USAF Retired) Richard Szafranski in 1996.²¹ This report suggested that memes acted like a mind virus and that memetics could be applied to Information Warfare with

¹⁶ Shifman, 367.
¹⁷ Shifman, 367.
¹⁸ Shifman, 368.
¹⁹ Vera Zakem, McBride, and Kate Hammerberg, “Exploring the Utility of Memes for U.S. Government Influence Campaigns” (CNA Analysis and Solutions, April 2018), iii.
²⁰ Zakem, McBride, and Hammerberg, iv.
²¹ Edmund M. Glabus, “Metaphors and Modern Threats: Biological, Computer, and Cognitive Viruses.” (US Army War College, 1998), 205, <http://www.jstor.com/stable/resrep11957.13>.

the intent of inserting new memes into the mind of the adversary.²² Edmund Glabus referenced this report later in 1996 where he advocates for the virus analogy in the context of meme warfare, but also notes that memetic warfare is the “least tangible type of warfare” and not “proven” by academics or strategists.²³ He notes that due to the immaturity of memetics, it should be considered as an “innovative idea” rather than a doctrine or a concept.²⁴

In the early 2000’s, the civilian industry had some success with using memes for internal change management, and the United States and its allies were having difficulty fighting counterinsurgency in Iraq and Afghanistan.²⁵ The difficulty of the counterinsurgency campaign in Iraq highlighted a pattern of behaviour similar to Vietnam, where the US and its allies relied too heavily on military technology rather than adopting more holistic counterinsurgency strategies.²⁶ This led to the US revising its FM 3-24 counterinsurgency manual to place more emphasis on the non-military factors that significantly shape and impact insurgency and terror campaigns such as political, economic, social, infrastructure, physical environment and time.²⁷ Whilst an improvement on the previous manual, one criticism of the revised edition was that it applied a reductionist approach to a complex and adaptive system by implying that treating the symptoms of the insurgency (such as poverty) would inevitably make the insurgency go away.²⁸ What it did not adequately address was how to treat the ideology. Around 2005, US defence think tanks and contractors saw examples of civilian industry using the concept of memes to implement change management within their organisations and proposed the idea of using memes to solve military problems such as insurgent ideology.²⁹

Major Michael B Prosser from the United States Marine Corps authored one of the earliest military-specific papers on memetics where he proposed that the US needed to embrace ideological warfare through the weaponizing of memes to succeed in the future battlespace. Prosser took a mentalist-driven approach, defining memes as “metaphysical, intangible entities, transmitted from mind to mind, either verbally, with actions, music, or by repeated actions and/or imitation.” He argues that memes influence ideas, which form beliefs, which combine with other factors, such as feelings and emotions, to influence behaviour.³⁰ He boldly proposed the creation of a Meme Warfare Centre which would be comprised of an Internal Meme Centre (IMC) and an External Meme Centre. The IMC would manage internal memes to achieve desired effects within the organisation such as change management. The EMC would focus on memes external to the organisation such as combatting insurgent ideology.³¹ Aside from being one of the first military-specific memetics papers, one of the key contributions of

²² Glabus, 206.

²³ Glabus, 204.

²⁴ Glabus, 197.

²⁵ Michael B. Prosser, “Memetics - A Growth Industry in US Military Operations” (Marine Corps University, January 1, 2006), 5, <https://apps.dtic.mil/sti/citations/ADA507172#:~:text=Memes%20are%20units%20of%20cultural,the%20minds%20of%20the%20undecided.>

²⁶ Bruce R Pirnie and Edward O’Connell, “Counterinsurgency in Iraq (2003-2006)” (RAND Corporation, 2008), xiv.

²⁷ Brian J. Hancock, “Memetic Warfare: The Future of War,” *Military Intelligence Professional Bulletin* (U.S. Army Intelligence Center and School, April 1, 2010), Gale Academic OneFile.

²⁸ Hancock.

²⁹ Prosser, “Memetics - A Growth Industry in US Military Operations,” 5.

³⁰ Prosser, 2.

³¹ Prosser, 14.

Prosser's paper was to distinguish his version of memetic warfare from standard Information Operations. The fundamental difference in Prosser's conception of the MWC was the intended target audience and the expertise of personnel contributing to the operations. Prosser states that where traditional Information Operations primarily target enemy combatants, the MWC specifically targets non-combatants.³² A controversial concept in and of itself. He also notes that traditional Psychological Operations task forces are generally small and specialised, whereas the MWC would be a joint and inter-agency organisation combining subject matter experts in culture, economy, linguistics, targeting and military technical and assessment experts.³³ The major challenge with his idea of establishing a MWC was that memetics was not yet established as a recognised discipline, therefore it was not realistic to expect the US Military to approve creation of a new organisation without further establishment of the field.

From 2006 to 2009 the US Defence Advanced Research Projects Agency (DARPA) funded Robotic Technology Inc. to establish a scientific basis for memetics.³⁴ The project led by Dr Robert Finkelstein delivered a 1680 page 'Memetics Compendium' which collated a wide array of papers from different authors on topics related to memetics, and a 152 slide tutorial on 'Military Memetics' which provides a comprehensive definition of memetics and their potential military uses. Dr Finkelstein's work proposed that a military memetics program could have utility for countering ideology, conflict prevention and strengthening the US military in peacekeeping, PSYOPS, recruitment and training.³⁵ The proposed definition for a meme was any information that propagates, has impact, and persists, with detailed criteria developed for each of those properties.³⁶ The report proposed a framework for the operational application of memetics by establishing a Meme Control Centre comprising of a Meme Processing Center (MPC) and a Counter-Meme Processing Centre (CPC) which would include meme engineering staff from multi-disciplinary backgrounds, similar to Prosser's concept of having a broad range of subject matter experts within an MWC.³⁷

In 2010, the year after the conclusion of the DARPA Military Memetics program, Brian Hancock, an Information Executive who joined the US Army and worked within Psychological Operations Group, produced a paper again arguing that the "emerging subfield of psychology known as memetics" could be used to attack the root cause of insurgency and indeed other social problems.³⁸ Hancock used a mentalist approach to memetics defining memes as ideas that are passed between minds. He draws on the analogy of memes as a mind-virus which is used to describe "pathogenic memes which have potentially disastrous effects on their hosts and neighbours."³⁹ Hancock concludes that the root cause of terrorism, insurgency and other social problems is that people suffer from contagious diseases of the mind, and that they can be 'cured' by identifying, tracking, isolating, eliminating and inoculating people against the harmful memes. He, therefore, defined memetic warfare as the displacement or overwriting of dangerous memes and memplexes with more benign or beneficial ones.⁴⁰ Hancock proposed that

³² Prosser, 17.

³³ Prosser, 14.

³⁴ "Military Memetics, Robotic Technology Inc., Robots, Unmanned Vehicles, Artificial Intelligence and More.," accessed October 10, 2024, <https://www.roboticstechnologyinc.com/index.php/military-memetics>.

³⁵ Finkelstein, "Tutorial: Military Memetics," 12.

³⁶ Finkelstein, 34.

³⁷ Finkelstein, 93.

³⁸ Hancock, "Memetic Warfare: The Future of War."

³⁹ Hancock.

⁴⁰ Hancock.

offensive memetic operations should be articulated at the Theatre level in military operations to communicate the commander's intent. Memetic operations should be led by intelligence staff who coordinate and deconflict with non-governmental organisations, and synchronise capabilities such as cyber warfare, public affairs and psychological operations platforms to both propagate the memetic message and monitor for feedback. Hancock's view is that 'memetic saturation' is achieved once the target population exhibits artifacts and behaviours that support friendly forces, and that ongoing monitoring is required to maintain the desired memplexes.⁴¹

The following year, in 2011, DARPA funded a project called Social Media in Strategic Communication (SMISC) which ran until 2015. The purpose of SMISC was to develop automated and semi-automated tools and techniques for the use of social media data. One of the program goals was to develop tools and techniques for detecting, classifying, measuring and tracking the formation and spread of memes (defined as ideas and concepts) and purposeful and deceptive messaging and misinformation.⁴² The SMISC ran for four years, cost \$50 million dollars, and published over 200 papers. Subsequent DARPA projects that are not explicitly framed as memetic warfare, but continue on the theme of online information and influence war include the 2021 Influence Campaign Awareness and Sensemaking program in 2021, and various projects sponsored by the DARPA Information Innovation Office which are ongoing in 2024.⁴³

In 2016, meme warfare was brought back into the foreground of so-inclined military circles by Jeff Gisea, who authored a paper in the North Atlantic Treaty Organisation (NATO) publication *Defence Strategic Communications* titled 'It's time to embrace memetic warfare'.⁴⁴ Gisea wrote the paper in response to the extremely effective online strategies deployed by Islamic State in Iraq and Syria (ISIS). In the paper, Gisea frames memetic warfare as a subset of information operations specific to social media and defines memetic warfare as "competition over narrative, ideas and social control in a social-media battlefield".⁴⁵ He goes further to distinguish conventional memetic warfare, which is equivalent to propaganda and public diplomacy, from guerrilla memetic warfare, which is trolling and psychological operations.⁴⁶ He argues that memetic warfare is inexpensive, has asymmetric impact and global reach and that it can be used in an offensive, defensive and predictive capacity. Gisea makes four recommendations to the NATO community to embrace memetic warfare as a method to defeat ideology. Firstly he proposes that NATO must normalise memetic warfare in the military through the development of memetic warfare concepts and language. Secondly he proposes that NATO members should allocate resources to developing memetic warfare. He uses the analogy of cyber warfare taking control of data, and memetic warfare taking control of the "dialogue, narrative, and psychological space".⁴⁷ Thirdly, Gisea proposes that military leaders must embrace a "memetic mindset" and empower those within the organisation that already have it. They should observe what does and doesn't work, experiment, and network with those that achieve success such as marketers, internet trolls, hackers and

⁴¹ Hancock.

⁴² infoprof, "The Story Behind the DARPA Social Media in Strategic Communication (SMISC) Program," Information Professionals Association, June 28, 2017, <https://information-professionals.org/the-darpa-social-media-in-strategic-communication-smisc-program/>.

⁴³ "Information Innovation Office," accessed October 10, 2024, <https://www.darpa.mil/about-us/offices/i2o/more>.

⁴⁴ Jeff Gisea, "It's Time to Embrace Memetic Warfare," *Defence Strategic Communications*, March 1, 2016.

⁴⁵ Gisea, 69.

⁴⁶ Gisea, 69.

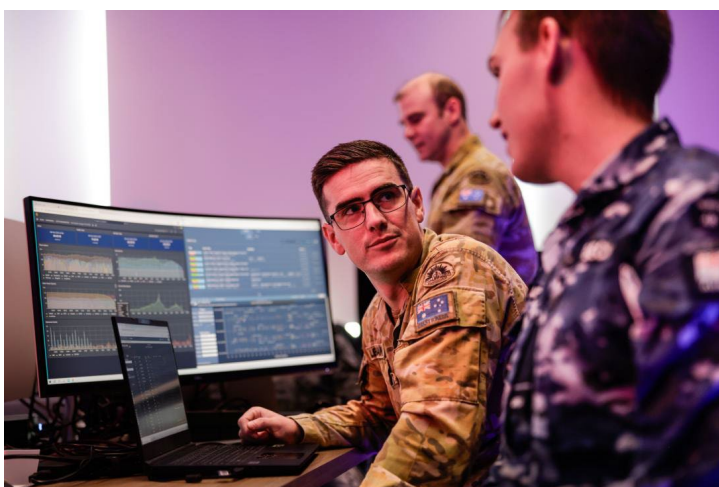
⁴⁷ Gisea, 70.

PR subject matter experts.⁴⁸ Lastly, Gisea proposes that NATO must make legal, bureaucratic and ethical space for memetic warfare due to the many potential challenges associated with the techniques.⁴⁹

The history of military memetics is well described by John Robb who is an ex United States Air Force pilot with experience in special operations where he observes, “stuff like this is perennial...every couple of years a new program comes out, people spend money for a couple of years then it goes away. Then people forget about that failure and they do it again.”⁵⁰ This is a somewhat scathing review of military memetics, but it reflects the polarisation in attitudes towards the field of memetics in general. The ADF should take heed of this advice in the future application of resources to study memetics, viewing memetics as one of several frameworks for thinking about narrative and cognitive warfare within the Information domain. Memetics is not a panacea as it has been viewed by some, but it does offer potentially useful frameworks that could be operationalised in a pragmatic way, and for minimal cost, as argued by Gisea.

Contemporary Meme Warfare and Applicability to Australia

The ongoing conflict between Russia and Ukraine provides an opportunity to observe the use of memetic warfare during a contemporary conflict. Sarah Kreps, Paul Lushenkko, and Keith Carter used an empirical approach to analyse Ukrainian-themed memes (in this case, the term meme is being used in the ‘popular’ sense being an image or video posted online) posted



to Reddit and plotted the frequency against key military milestones during the war. They found that the frequency of memes was highest during the Russian invasion of Ukraine in 2022 and has steadily declined since that time.⁵¹ They inferred this decline indicates that the meme war is most likely being waged by the public rather than as a government-led activity, as a government-led activity would likely have a more sustained frequency over time.⁵² This is a plausible explanation. However, it could also mean that the meme war shifted from Reddit to other platforms, or it could mean that the public component of the meme war decreased in frequency and that the government component remained

⁴⁸ Gisea, 73.

⁴⁹ Gisea, 74.

⁵⁰ Siegel, “Is America Prepared for Meme Warfare?” Vice: Tech, January 31, 2017, <https://www.vice.com/en/article/meme-warfare/>.

⁵¹ Sarah Kreps, Paul Lushenko, and Carter, Keith, “Lessons from the Meme War in Ukraine” (Brookings, February 10, 2023), <https://www.brookings.edu/articles/lessons-from-the-meme-war-in-ukraine/>.

⁵² Kreps, Lushenko, and Carter, Keith.

constant but is less significant in volume than the public component. Their study, whilst interesting, highlights some of the weaknesses in using empirical approaches to memes, as drawing meaningful inferences from somewhat limited data sets is difficult.

The Ukrainian government has used online communication to seek support and promote its political agenda throughout the course of the conflict.⁵³ The Ukrainian government runs several official X accounts and has not shied away from amplifying memes via these official accounts. Many of the memes are shared by the Ukrainian Government's Ukraine Crisis Management Centre (UCMC) account which "uses popular visual culture to reach the public."⁵⁴ Ukrainian Government accounts have been used to share memes that are often "dark and witty, reflecting the Ukrainian spirit and using sarcasm to convey actual events".⁵⁵ These memes and other media shared by the official accounts are often shared in multiple languages, which enables online resistance groups globally to create 'spin-off' memes, which results in greater longevity of the meme as it evolves and spreads over time.⁵⁶ Whilst the reader of this paper may not be able to recall a specific instance of the following memes, it is highly likely the reader can recall the idea of Ukrainian farmers towing away Russian military hardware using tractors, the Ukrainian soldiers on Snake Island telling a Russian warship to "go f*** itself", and the Ukrainian President Volodymyr Zelenskyy stating that he needs ammunition and not a ride in response to offers to evacuate him at the start of the war. These are all memes that have been shared through official Ukrainian government accounts, online resistance groups, and others. One benefit of utilising official accounts to spread memes is that the use of humour by power can render criticism less effective, captured well by the quote "the smartest is the king who, indeed, is his own jester".⁵⁷ It can also contribute to internal unity, attract wider audiences, 'win hearts', boost morale and expose disinformation, however, it needs to be culturally sensitive and strategically calibrated, particularly if it is to be effective to non-Western audiences.⁵⁸ This last point is particularly poignant for Australia given the strategic focus on the Indo-Pacific region. The Indo-Pacific is a diverse region, and memetic material that works for a Western audience may not have the same effect on other audiences, and visa-versa. There are also likely to be different memetic attack vectors that adversaries could exploit, such as targeting the wives of military members. In some cultures, wives have a much more formal military standing than in Australia, for example, the Wives Soldiers Union in Indonesia.⁵⁹ These organisations could be targeted with the intent of impacting the service of their husbands. Cultural understanding and strategic empathy are therefore required to reduce the likelihood of undesirable effects in memetic warfare.

⁵³ Tine Munk 1970- author., "Memetic War : Online Resistance in Ukraine / Tine Munk.," January 1, 2024, 81, <https://research.ebsco.com/linkprocessor/plink?id=43c93bc7-4b9f-3a62-ae25-18bad3b41d11>.

⁵⁴ Tessa Cuppens, "The Weaponisation of Memes," Stichting Jason, March 26, 2023, <https://jasoninstitute.com/the-weaponisation-of-memes/>.

⁵⁵ Munk, "Memetic War : Online Resistance in Ukraine / Tine Munk.," 83.

⁵⁶ Munk, 83.

⁵⁷ Metahaven, ed., *Can Jokes Bring down Governments? Memes, Design and Politics*, First edition (Moscow: Strelka Press, 2013), 17.

⁵⁸ Olga Tokariuk, "Humour as a Strategic Tool against Disinformation Ukraine's Response to Russia," Journalist Fellowship Paper (University of Oxford, June 2023), https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2023-12/RISJ%20Project_OlgaT_HT23_Final.pdf.

⁵⁹ Cicilia Dewantara, Sebastian Koto, and Tommy Hariyanto, "The Role of the Army Spouse Association (PersitKartika Chandra Kirana) in Supporting the Task of the Indonesian Army," *IOSR Journal of Humanities and Social Science* 23, no. 7 (July 2018), <https://www.iosrjournals.org/iosr-jhss/papers/Vol.%2023%20Issue7/Version-10/C2307102029.pdf>.

The amplification of memes, in particular humorous ones, from official Ukrainian government and Defence channels begs the question as to what role, if any, Australian Defence Force official accounts could play in either peacetime or a future conflict. Utilising X as an example, Australian politicians, including the Prime Minister, have demonstrated a willingness to post humorous memes to pursue their own political goals with mixed reception⁶⁰. Australian Defence Force official accounts, however, maintain a professional demeanour, with posts seemingly generated using standard corporate marketing templates and lacking any edgy or humorous aspect. This is appropriate given the professional image the ADF is trying to project, which in itself can be considered a meme. However, the trade-off of not using edgier memes is opportunity cost in terms of reach and potential appeal to a more diverse audience. One major contextual difference, of course, is that Ukraine is currently in a war of survival, and the ADF is not. The ADF's risk tolerance for edgier online activities might increase under such circumstances. The ADF could consider creating separate accounts that are dedicated to spreading edgier memes, similar to Ukraine's UCMC account. Another avenue for the ADF to spread memes could be via non-attributable means such as pseudo-accounts or paying influencers. Such deployment of memes by the ADF raises both ethical and legal questions as the information domain includes Australia and Australians. Given the prevalence of memes online during the invasion of Ukraine, it is likely that future conflicts in which Australians are more personally involved will involve some form of online meme war. The ADF should consider what role, if any, its official accounts will take in interacting with such material, noting the utility it has served for the Ukrainian military but also the risks associated with this approach.

Online civic resistance in the form of meme warfare has been observed to play a role in countering Russian information operations online, helping bring Ukrainians closer together and garner international support.⁶¹ One of the most prominent examples arising from the conflict is the formation of the North Atlantic Fella Organisation or NAFO. This group has been described as “the shit-posting, twitter-trolling, dog-deploying social media army taking on Putin one meme at a time.”⁶² The group was formed in May 2022 by Kamil Dyszewski, who started to make cartoon dog pictures to thank people who donated to the Georgian Legion fighting in Ukraine.⁶³ The group has grown into a decentralised group of volunteers, recognisable by their customised Shiba Inu-themed profile pictures, who produce memes to counter Russian disinformation online and raise funds to support the Ukrainian war effort. NAFO claims to have in excess of 85,000 members worldwide including an Asia Pacific ‘division’.⁶⁴ The group has attracted support from political and media figures, including Australians such as General (retired) Mick Ryan and ex-Australian Ambassador to Ukraine, Bruce Edwards and has also been acknowledged by official Ukrainian government accounts. NAFO accounts have at times attracted direct replies from official Russian government accounts. NAFO's strength lies in its decentralisation, which makes it extremely resilient and able to respond rapidly to

⁶⁰ “Albanese Tells Critics of Labor’s Three-Eyed Nuclear Memes to ‘Lighten Up,’” *ABC News*, June 21, 2024, <https://www.abc.net.au/news/2024-06-21/albanese-reponds-to-nuclear-meme-critics/104005762>.

⁶¹ Munk, “Memetic War : Online Resistance in Ukraine / Tine Munk.,” 77.

⁶² “The Shit-Posting, Twitter-Trolling, Dog-Deploying Social Media Army Taking on Putin One Meme at a Time,” *POLITICO*, August 31, 2022, <https://www.politico.eu/article/nafo-doge-shiba-russia-putin-ukraine-twitter-trolling-social-media-meme/>.

⁶³ Jason Jay Smart, “Founder of NAFO Reveals Identity, Discusses Raison D’être,” *Kyiv Post*, November 14, 2022, <https://www.kyivpost.com/post/204>.

⁶⁴ “Want to Help Ukraine Online? Join NAFO!,” NAFO Asia Pacific, accessed October 11, 2024, <https://nafo.ukrainians.org.au/>.

emerging Russian disinformation.⁶⁵ As well as memes being used by NAFO to counter disinformation, they have played a role in the growth of NAFO itself. This is because the participation and consumption of memes encourage people to develop networks.⁶⁶ This particular utility of memes in helping people to develop networks would be especially useful for the ADF to consider in peacetime in terms of recruiting via social media, but also the role of memes in informal social groups within the ADF and how they shape ADF culture.

One of the primary objectives of NAFO is to counter Russian disinformation, and any future Indo-Pacific conflict is unlikely to be immune from such Russian tactics. Russia has attempted to build greater influence in the Indo-Pacific region, and whilst it is not a major power in the region, it is powerful enough to disrupt the regional order and promote its anti-Western interests.⁶⁷ China has also invested heavily in tools to manipulate narratives and has its own army of online trolls called the “50 cent army” who currently promote a positive message online to make it appear as if there is widespread support for Chinese narratives.⁶⁸ China is active in trying to shape narratives over Taiwan and its claims over the South China Sea in Western media. It is likely that disinformation and contest over narrative would increase during times of conflict in the Indo-Pacific region. It is reasonable to expect that online civic resistance would be observed in the event of major conflict within the Indo-Pacific. NAFO already has an Asia-Pacific division, and whilst NAFO is predominantly focused on Ukraine, it is possible that they could pivot to an Indo-Pacific conflict, particularly with their experience in countering Russian disinformation. If not NAFO, then a NAFO-like model (SEAFO?) may form whereby an army of online citizens counter Chinese and Russian disinformation and false narratives specific to the Indo-Pacific region. The ADF should consider the possible involvement of NAFO or an NAFO-like online civic resistance within the Indo-Pacific and determine to what extent, if any, the ADF would interact with such a movement. For example, NAFO often amplifies memes posted from official Ukrainian accounts and creates ‘spin-off’ memes that assist in the propagation of the meme. The ADF could exploit this type of behaviour and use it as an opportunity to gain reach in spreading memes created by and beneficial to the ADF.

Whilst it is easy to be distracted by the more visible online meme war when considering the conflict between Russia and Ukraine, it is important to consider the role that less visible and ‘higher level’ memes had in the lead-up to the conflict. That is memes as ideas. Viewing things through a memetic lens, Putin and likely those around him had memes or meme complexes that viewed Ukraine as having no national identity and Russia needing to be restored to its former glory.⁶⁹ Those almost certainly contributed to Putin’s decision to invade Ukraine. From a Western perspective, some experts and many members of the public were surprised that Ukraine was able to withstand the initial

⁶⁵ “Why Decentralisation Is NAFO’s Greatest Strength,” *Emerging Europe*, January 25, 2023, <https://emerging-europe.com/opinion/why-decentralisation-is-nafos-greatest-strength/>.

⁶⁶ Roberta Bracciale and Junio Aglioti Colombini, “Meme Tales: Unraveling the Function of Memes in the Russian-Ukraine Conflict,” *RIVISTA TRIMESTRALE DI SCIENZA DELL’AMMINISTRAZIONE* 2023 (January 1, 2023): 28, <https://doi.org/10.32049/RTSA.2023.4.08>.

⁶⁷ Derek Grossman, “Russia Is a Strategic Spoiler in the Indo-Pacific,” July 12, 2024, <https://www.rand.org/pubs/commentary/2024/07/russia-is-a-strategic-spoiler-in-the-indo-pacific.html>.

⁶⁸ David Kirichenko, “Can NATO’s Ukraine success be extended to Taiwan,” *PacNet Newsletter*, no. 60 (August 10, 2023): 1–3.

⁶⁹ “The Great Blunder: Why Did Putin Miscalculate over Ukraine?” *EUROPP* (blog), March 6, 2023, <https://blogs.lse.ac.uk/europpblog/2023/03/06/the-great-blunder-why-did-putin-miscalculate-over-ukraine/>.

Russian invasion. This may have been due to memes circulating about Russia being a 'near-peer' adversary to the United States, with an almost 'mystical' military ability. These memes started spreading in Western military circles after Russia's successful annexation of Crimea and interventions in Syria.⁷⁰ Applying this to an Australian context, it would be beneficial for the ADF to be aware of the memes that exist about its potential adversaries, particularly among ADF decision-makers. Similarly, it would be beneficial for the ADF to be aware of what memes the general public, foreign militaries and governments possess about the ADF. If memes are identified that are not beneficial to the ADF, it would be beneficial for the ADF to have the capability to replace those memes with more favourable ones.

Conclusion

Jacob Siegel provides almost the perfect quote regarding the discipline of memetics since the term meme was first coined by Richard Dawkins in 1976. "Memetics, the study of meme theory and application is a kind of grab bag of concepts and disciplines. It's part biology and neuroscience, part evolutionary psychology, part old fashioned propaganda, and part marketing campaign...though memetics currently exists somewhere between science, science fiction, and social science, some enthusiasts present it as a kind of hidden code that can be used to reprogram not only individual behaviours but entire societies."⁷¹

Through providing the history of memetics and military memetics, this research paper has highlighted that there is no universally accepted definition of what a meme is, let alone a unifying theory of memetics. Bold proposals have been made within the field of military memetics, including the proposal that entire military meme units be formed, none of which have come to fruition. Memetics is a polarising field that tends to push people to extreme ends of the spectrum of opinions. Despite there being no unifying theory, the strength of intentionally adopting a memetic mindset is the requirement to seek expertise from multiple fields to help solve problems in the Information warfare domain. In that sense, memetics is relevant to the ADF, but further research is required on how the ADF could operationalise memetic concepts, without exaggerating the potential outcomes of adopting such a framework.

Memes, both in the popular and academic sense, have featured heavily in the ongoing conflict between Ukraine and Russia. Civic online resistance is a significant factor in the current meme war, with the resilient, decentralised NAFO being the main actor. NAFO's primary utility lies in rapidly countering Russian disinformation and advancing Ukraine's agenda to an international audience. Given that any future conflict in the Indo-Pacific region is likely to feature Russian and Chinese disinformation and narrative campaigns, the ADF must consider how NAFO or a similar organisation would act to counter that disinformation and to what extent, if any, the ADF should interact with such a movement. The successful use of, and engagement with, memetic material online by official Ukrainian Defence accounts indicates that the ADF should consider its position with regard to engaging with such material online. Lastly, the ADF may benefit from considering what memes, in the sense of ideas, are prevalent within its leadership and how that may affect decision-making. Similarly, the ADF may benefit from considering what memes exist in the minds of others regarding the ADF.

Memetic warfare is relevant to the ADF and should be approached as an intentional decision to engage memetic frameworks to assist in approaching Information Domain

⁷⁰ Bettina Renz, "Western Estimates of Russian Military Capabilities and the Invasion of Ukraine.," *Problems of Post-Communism* 71, no. 3 (May 1, 2024): 4, <https://doi.org/10.1080/10758216.2023.2253359>.

⁷¹ Siegel, "Is America Prepared for Meme Warfare?"

related problems such as narrative and cognitive warfare. Engaging such frameworks can have utility across the full spectrum of conflict, as well as in training, recruitment and organisational culture.

References

ABC News. "Albanese Tells Critics of Labor's Three-Eyed Nuclear Memes to 'Lighten Up.'" June 21, 2024. <https://www.abc.net.au/news/2024-06-21/albanese-reponds-to-nuclear-meme-critics/104005762>.

Aunger, Robert. "A Report on the 'conference Do Memes Account for Culture?' Held at King's College, Cambridge." *Journal of Memetics - Evolutionary Models of Information Transmission* 3, no. 2 (December 1, 1999): 39.

Best, Michael L. "Memes on Memes -- a Critique of Memetic Models." *Journal of Memetics - Evolutionary Models of Information Transmission* 2, no. 1 (June 1, 1998): 1.

Bracciale, Roberta, and Junio Aglioti Colombini. "Meme Tales: Unraveling the Function of Memes in the Russian-Ukraine Conflict." *RIVISTA TRIMESTRALE DI SCIENZA DELL'AMMINISTRAZIONE* 2023 (January 1, 2023): 36. <https://doi.org/10.32049/RTSA.2023.4.08>.

Cuppens, Tessa. "The Weaponisation of Memes." Stichting Jason, March 26, 2023. <https://jasoninstitute.com/the-weaponisation-of-memes/>.

Dewantara, Cicilia, Sebastian Koto, and Tommy Hariyanto. "The Role of the Army Spouse Association (Persit Kartika Chandra Kirana) in Supporting the Task of the Indonesian Army." *IOSR Journal of Humanities and Social Science* 23, no. 7 (July 2018). <https://www.iosrjournals.org/iosr-jhss/papers/Vol.%2023%20Issue7/Version-10/C2307102029.pdf>.

Dirlam, D.K. "Using Memetics to Grow Memetics." *Journal of Memetics* 9, no. 1 (January 1, 2005). <https://research.ebsco.com/linkprocessor/plink?id=24b1ec95-061b-3a1e-b110-66d67349c109>.

Emerging Europe. "Why Decentralisation Is NAFO's Greatest Strength," January 25, 2023. <https://emerging-europe.com/opinion/why-decentralisation-is-nafos-greatest-strength/>.

EUROPP. "The Great Blunder: Why Did Putin Miscalculate over Ukraine?," March 6, 2023. <https://blogs.lse.ac.uk/europpblog/2023/03/06/the-great-blunder-why-did-putin-miscalculate-over-ukraine/>.

Finkelstein, Robert. "Tutorial: Military Memetics." Tutorial. Social Media for Defense Summit: Robotic Technology Inc., October 24, 2011. <https://www.roboticstechnologyinc.com/images/upload/file/Presentation%20Military%20Memetics%20Tutorial%20Conference%202013%20Dec%202011.pdf>.

Giese, Jeff. "It's Time to Embrace Memetic Warfare." *Defence Strategic Communications*, March 1, 2016.

Glabus, Edmund M. "Metaphors and Modern Threats: Biological, Computer, and Cognitive Viruses." US Army War College, 1998. <http://www.jstor.com/stable/resrep11957.13>.

Grossman, Derek. "Russia Is a Strategic Spoiler in the Indo-Pacific," July 12, 2024. <https://www.rand.org/pubs/commentary/2024/07/russia-is-a-strategic-spoiler-in-the-indo-pacific.html>.

Hancock, Brian J. "Memetic Warfare: The Future of War." *Military Intelligence Professional Bulletin*, U.S. Army Intelligence Center and School, April 1, 2010. Gale Academic OneFile.

infoprof. "The Story Behind the DARPA Social Media in Strategic Communication (SMISC) Program." Information Professionals Association, June 28, 2017. <https://information-professionals.org/the-darpa-social-media-in-strategic-communication-smisc-program/>.

"Information Innovation Office." Accessed October 10, 2024. <https://www.darpa.mil/about-us/offices/i2o/more>.

Kirichenko, David. "Can NATO'S Ukraine success be extended to Taiwan." *PacNet Newsletter*, no. 60 (August 10, 2023): 1–3.

Knobel, Michele, and Colin Lankshear. "Online Memes, Affinities, and Cultural Production." In *A New Literacies Sampler*, 199–227, 2007.

Kreps, Sarah, Paul Lushenko, and Carter, Keith. "Lessons from the Meme War in Ukraine." Brookings, February 10, 2023. <https://www.brookings.edu/articles/lessons-from-the-meme-war-in-ukraine/>.

Librarians, Health Liaison. "LibGuides: Qualitative Study Design: Case Studies." Accessed October 10, 2024. <https://deakin.libguides.com/qualitative-study-designs/case-studies>.

"Memes as an Online Weapon: An Analysis into the Use of Memes by the Far Right." National Coordinator for Security and Counterterrorism, May 2024. https://english.nctv.nl/binaries/nctv-en/documenten/publications/2024/08/01/far-right-memes-undermining-and-far-from-recognizable/NCTV_Memes+as+an+online+weapon_English+version+May+2024.pdf.

Metahaven, ed. *Can Jokes Bring down Governments? Memes, Design and Politics*. First edition. Moscow: Strelka Press, 2013.

"Military Memetics, Robotic Technology Inc., Robots, Unmanned Vehicles, Artificial Intelligence and More." Accessed October 10, 2024. <https://www.roboticstechnologyinc.com/index.php/military-memetics>.

Munk, Tine, 1970- author. "Memetic War : Online Resistance in Ukraine / Tine Munk.," January 1, 2024. <https://research.ebsco.com/linkprocessor/plink?id=43c93bc7-4b9f-3a62-ae25-18bad3b41d11>.

NAFO Asia Pacific. "Want to Help Ukraine Online? Join NAFO!" Accessed October 11, 2024. <https://nafo.ukrainians.org.au/>.

Pirnie, Bruce R, and Edward O'Connell. "Counterinsurgency in Iraq (2003-2006)." RAND Corporation, 2008.

POLITICO. "The Shit-Posting, Twitter-Trolling, Dog-Deploying Social Media Army Taking on Putin One Meme at a Time," August 31, 2022. <https://www.politico.eu/article/nafo-doge-shiba-russia-putin-ukraine-twitter-trolling-social-media-meme/>.

Prosser, Michael B. "Memetics - A Growth Industry in US Military Operations." Marine Corps University, January 1, 2006.
<https://apps.dtic.mil/sti/citations/ADA507172#:~:text=Memes%20are%20units%20of%20cultural,the%20minds%20of%20the%20undecided.>

Renz, Bettina. "Western Estimates of Russian Military Capabilities and the Invasion of Ukraine." *Problems of Post-Communism* 71, no. 3 (May 1, 2024): 219–31.
<https://doi.org/10.1080/10758216.2023.2253359>.

Richard Dawkins. *The Selfish Gene : 40th Anniversary Edition*. 40th anniversary edition. Oxford Landmark Science. Oxford: OUP Oxford, 2016.

Shifman, L. "Memes in a Digital World: Reconciling with a Conceptual Troublemaker." *Journal of Computer-Mediated Communication* 18, no. 3 (January 1, 2013): 362–77.
<https://doi.org/10.1111/jcc4.12013>.

Siegel. "Is America Prepared for Meme Warfare?" *Vice: Tech*, January 31, 2017.
<https://www.vice.com/en/article/meme-warfare/>.

Smart, Jason Jay. "Founder of NAFO Reveals Identity, Discusses Raison D'être." *Kyiv Post*, November 14, 2022. <https://www.kyivpost.com/post/204>.

Tokariuk, Olga. "Humour as a Strategic Tool against Disinformation Ukraine's Response to Russia." *Journalist Fellowship Paper*. University of Oxford, June 2023.
https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2023-12/RISJ%20Project_OlgaT_HT23_Final.pdf.

Wilkins, John S. "What's in a Meme?" *Journal of Memetics - Evolutionary Models of Information Transmission* 2, no. 1 (June 1, 1998): 56.

Zakem, Vera, McBride, and Kate Hammerberg. "Exploring the Utility of Memes for U.S. Government Influence Campaigns." *CNA Analysis and Solutions*, April 2018.

Autonomous and automated weapon systems and the traditional dynamics of conflict escalation. Strategies or policy considerations to counter emerging risks

Wing Commander Philip Tracy

Wing Commander Phil Tracy is a former P-8A Poseidon Pilot and graduate of the Australian Command and Staff Course class of 2023. He is currently posted to the Pentagon in Washington DC, where he works on warfighting requirements for future RAAF & US Naval Aviation capabilities

Introduction

Autonomous and automated weapon systems have transformed the landscape of 21st century warfare, presenting both enhanced capabilities and profound challenges. As these technologies evolve and proliferate, their role in conflict escalation has sparked significant debate among military experts and scholars. Proponents argue that these systems reduce the risks to military personnel and are therefore non-escalatory,¹ while others contend that these technologies fundamentally alter the character of warfare, introducing destabilising factors that increase the potential for unintended escalation.²

Central to this debate is how the integration of automated or autonomous systems into modern operations might alter the traditional dynamics of escalation in competition, crisis or conflict. This paper argues that these systems possess uniquely destabilising characteristics, thus increasing the likelihood of unintended escalation. In response to these risks, the paper's second argument is that by adopting specific policies and strategies, middle powers – such as Australia – can play an important role in mitigating automation-driven escalation.

This paper adopts definitions provided by Heather Roff to clarify the key terms used in its analysis. It is important to note that autonomous and automated systems exist on a technological spectrum; at one end, '*automated systems*' refer to un-crewed, remotely-controlled drones or other systems that execute pre-programmed, repeatable tasks without adaptation or learning. On the other end, '*autonomous systems*' are more

¹ Erik Lin-Greenberg, "Wargame of Drones: Remotely Piloted Aircraft and Crisis Escalation," in *Journal of Conflict Resolution* 66, No. 10 (2022).

<https://journals.sagepub.com/doi/10.1177/00220027221106960>

² Jonathan Panter, 'Naval Escalation in an Unmanned Context,' in *CIMSEC*, April 26, 2023.

<https://cimsec.org/naval-escalation-in-an-unmanned-context/>

sophisticated, equipped with artificial intelligence, and capable of independent decisions, target selection, learning, and adaptation.³ This distinction is critical for understanding the nuanced mechanisms of escalation discussed in this paper, which depend on the level of human oversight involved.

The paper identifies three primary mechanisms through which autonomous and automated systems drive escalation: (1) the creation of a *moral hazard*, where reduced personal risk emboldens decision-makers to pursue more aggressive actions; (2) the difficulty in distinguishing errors by automated and autonomous systems from deliberate hostile actions; and (3) the acceleration of warfare, driven by the integration of autonomous technology within command and control architectures.

After outlining the contemporary debate linking escalation and automation, the paper will establish a broad theoretical framework covering escalation dynamics. Analysis will build from this framework by first demonstrating how automated systems such as drones create a *moral hazard* that enables escalation. Second, it will examine how errors in human-machine interfaces – across both automated and autonomous platforms – can be escalatory, especially when errors are misinterpreted as deliberate actions. Third, it will illustrate how autonomous systems in command and control architectures accelerate warfare, increasing the risk of uncontrolled escalation and reducing opportunities for de-escalation. Finally, it will outline a series of potential policy and strategy approaches, illustrating how Australia, as a middle power, is well-positioned to contribute to international efforts aimed at controlling automation-driven escalation.

It is important to clarify the scope of analysis. While demonstrating the escalatory potential of autonomous and automated systems will be a primary focus, the concept of the *security dilemma* – where rapid proliferation of weapon systems by one state prompts similar actions by others, thus raising overall tensions⁴ – will not be addressed. Although the security dilemma remains relevant in the broader sense of escalation, it is a well-established concept in academic literature, and is not unique to autonomous or automated weapon systems. This paper will instead focus on the specific, under-explored mechanisms by which automation and autonomy uniquely influence escalation dynamics, and the strategies that could mitigate these risks.

Literature Review

Part 1: Contemporary Debate on Autonomous Systems and Escalation

Recent studies have explored the impact of automated weapon systems, such as remotely controlled drones, on conflict escalation. Erik Lin-Greenberg's research examined military decision-making through the 'action-reaction' framework, which Richard Smoke described as the 'heart of escalation dynamics.'⁵ Lin-Greenberg's methodology involved simulated wargames, surveys, and discussions to assess differences in how militaries respond to the loss of automated drones versus crewed aircraft in comparable situations. His findings suggest that drones have a stabilising effect over conflict, since their destruction tends to elicit a less aggressive retaliation than

³ Heather Roff, "Distinguishing autonomous from automatic weapons," in *Bulletin of the Atomic Scientists*. February 9, 2016. https://thebulletin.org/roundtable_entry/distinguishing-autonomous-from-automatic-weapons/

⁴ Gregory J. Rattray, "Explaining Weapons Proliferation: Going beyond the Security Dilemma," in *USAF Academy Institute for National Security Studies, FNSS Occasional Papers*, no. 1 (2016). <https://irp.fas.org/threat/ocp1.htm>

⁵ Richard Smoke, *War: Controlling Escalation* (Cambridge MA: Harvard University Press, 1977), 268.

crewed platforms.⁶ While this stabilisation effect is significant, it leaves open questions about the broader impact of automation on risk-taking behaviour and decision-making thresholds, which this paper will address.

In contrast to Lin-Greenberg's findings, John Schaus and Kaitlyn Johnson stated that as of 2018, the impact of automated platforms on escalation dynamics remained unclear.⁷ More recently, a CNA (Center of Naval Analysis) report argued that automated systems are likely to be escalatory, however this analysis was largely conceptual, lacking empirical case examples to support its claim.⁸ Jonathan Panter's research presents a similar viewpoint, indicating that these platforms introduce new risks in crisis or conflict situations.⁹ Although Panter's findings are not conclusive, they raise two critical issues with automated and autonomous systems: (1) that major errors can occur, and remain undetected, when machines take over the work of humans, and (2) that these systems could create a '*moral hazard*,' where decision-makers take riskier actions when they do not personally bear the consequences.¹⁰ While Panter's work offers valuable insights, the lack of real-world examples leaves a gap in fully understanding these risks. This paper fills this gap by using empirical case examples to illustrate how these mechanisms contribute to escalation dynamics.

Part 2: Escalation Theory, Theoretical Framework and Methodology

To analyse the risks posed by autonomous and automated systems, it is crucial to first establish a clear theoretical framework of escalation. Numerous scholars, particularly from the Cold-War era, have established models of escalation dynamics. Among the most influential is Herman Kahn's model of an *escalation ladder* (Figure 1), which depicts the progression of conflict through a series of 'rungs' from sub-crisis disagreement to all-out war.¹¹ However, while Kahn's ladder is useful for illustrating the intensification of conflict, it is a structural metaphor rather than a procedural one; it does not fully capture *how* conflicts can transform and escalate over time, which is of critical importance to the analysis in this paper.

⁶ Erik Lin-Greenberg, "Wargame of Drones: Remotely Piloted Aircraft and Crisis Escalation."

⁷ John Schaus and Kaitlyn Johnson, "Unmanned Aerial Systems' Influences on Conflict Escalation Dynamics," In *CSIS Briefs*, August 2, 2018. <https://www.csis.org/analysis/unmanned-aerial-systems-influences-conflict-escalation-dynamics>

⁸ 'Impact of Unmanned Systems on Escalation Dynamics,' CNA Center for Autonomy and IA. Accessed September 20, 2024. https://www.cna.org/archive/CNA_Files/pdf/summary-impact-of-unmanned-systems-to-escalation-dynamics.pdf

⁹ Jonathan Panter, 'Naval Escalation in an Unmanned Context.'

¹⁰ 'Moral Hazard', Merriam-Webster, Accessed September 20, 2024. <https://www.merriam-webster.com/dictionary/moral%20hazard>

¹¹ Herman Kahn, *On Metaphors, Escalation and Scenarios*, (New York: Routledge, 1962), 185.

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16. Aftermath
 15. Some Kind of "All-Out" War
 14. "Complete" Evacuation
 13. Limited Non-Local War
 12. Controlled Local War
 11. Spectacular Show of Force
 10. Super-Ready Status
 9. Limited Evacuation
 8. Intense Crisis
 7. Limited Military Confrontations
 6. Acts of Violence
 5. Modest Mobilization
 4. Show of Force
 3. Political, Diplomatic, and Economic Gestures
 2. "Crisis"
 1. Subcrisis Disagreement
-

SOURCE: Kahn (1962:185).

Fig. 1—Kahn's 16-step escalation ladder

Kahn also divided the concept of escalation into three distinct categories: 'increasing intensity,' 'widening the area' and 'compounding escalation'.¹² Forrest Morgan et al. later adapted these ideas into the more widely used terms of *horizontal* and *vertical* escalation.¹³ *Vertical escalation* refers to intensifying conflict – toward the top of Kahn's ladder – while *horizontal escalation* involves widening the conflict's scope through indirect means, such as proxy wars. These concepts are valuable in understanding how autonomous and automated systems influence both forms of escalation.

Thomas Schelling's *Strategy of Conflict* and Richard Smoke's *War: Controlling Escalation* both add critical refinement to Kahn's ladder model by introducing the concept of *salient limits* – unspoken thresholds that actors avoid crossing in order to prevent escalation.^{14,15} Smoke argues that escalation occurs when these subtle yet critical limits are breached. Escalatory actions, in this view, are defined not by size or by scale, but by whether they violate these recognised boundaries, which are discrete, objective, understood and respected by both sides.¹⁶ Thus, any technology that enables actors to unknowingly cross these limits more easily can be considered escalatory.

A related concept is that of *moral hazard*, which is a key concept in this paper. Moral hazard occurs when decision-makers take greater risks because they do not personally bear the consequences of their actions.¹⁷ This phenomenon is well documented in fields

¹² Kahn, On Metaphors. 4-5.

¹³ Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff. "The Nature of Escalation," In *Dangerous Thresholds: Managing Escalation in the 21st Century*, 1st ed., 7–46. RAND Corporation, 2008. <http://www.jstor.org/stable/10.7249/mg614af.9>

¹⁴ Smoke, War: Controlling Escalation, 33.

¹⁵ Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960), 5.

¹⁶ Smoke, War: Controlling Escalation, 33.

¹⁷ 'Moral Hazard', Merriam-Webster, Accessed September 20, 2024. <https://www.merriam-webster.com/dictionary/moral%20hazard>

such as corporate governance, finance, and healthcare.¹⁸ In the context of automated and autonomous weapons systems, moral hazard is especially relevant. By reducing risk to military personnel, automated platforms may embolden decision-makers, thus reducing the psychological barriers to crossing Schelling's salient limits. While moral hazard does not directly cause escalation, it increases the likelihood of conflict escalation by encouraging riskier decisions. This dynamic will be explored through case illustrations in the next section.

Richard Smoke also applied the concept of salient limits to explore *uncontrolled escalation*. He described situations where these limits are crossed without an actor appreciating 'the full consequences of his/her actions,' and where the opponent's likely reaction would cross further salient limits, leading to an out-of-control cycle of actions and reactions.¹⁹ Avoiding uncontrolled *vertical* escalation is crucial in the modern era, especially when parties to conflict may possess weapons of mass destruction. Therefore, this paper will also examine how automation and autonomy contribute to scenarios involving uncontrolled escalation.

Frank Zagare contributed to escalation theory through his modelling of game theory scenarios such as 'bluff', 'chicken', and the 'prisoner's dilemma,' which highlight the difficulty of interpreting adversary actions in high-stakes environments.²⁰ These theories emphasise the importance of interpreting adversary *intent*, and highlight how misunderstandings or miscalculations can lead to escalation. In the context of automated or autonomous systems, misattribution of intent – especially where errors or malfunctions are involved – mirrors these dilemmas. Escalation can occur when one side perceives an action as deliberate, even when it is not, driving conflicts toward higher levels of violence (or broader geographic spread).

From this theoretical framework we can identify three key criteria of escalatory technology to look for through empirical examples in our analysis: (1) It lowers or obscures Schelling's salient limits, making it easier for actors to take more aggressive actions; (2) it blurs the distinction between intentional and unintentional actions, increasing the likelihood of misinterpretation; and (3) it compresses decision-making timelines, reducing opportunities for reflection and restraint, leading to the crossing of critical thresholds. These criteria will be applied to the three mechanisms identified earlier, to argue how automated or autonomous systems can drive conflict escalation.

¹⁸ Examples of moral hazard include the Enron scandal, in which executives took excessive risks without facing direct consequences contributing to the company's collapse. See Muhamad Shoaib and Ruman Rabeet, "The Enron Scandal and Moral Hazard," *SSRN Electronic Journal*, January 2012. DOI:10.2139/ssrn.1987424.

Another example is the 2008 Global Financial Crisis (GFC), where financial institutions engaged in destabilising practises, assuming government bailouts would mitigate losses. See Phillip Y. Lipsky, and Haillie Na-Kyung Lee. "The IMF as a biased global insurance mechanism: Asymmetrical moral hazard, reserve accumulation, and financial crises." *International Organization* 73, no. 1 (2019): 35-64. Research also shows that individuals with comprehensive health insurance tend to engage in riskier behaviours, knowing their medical expenses are covered. See Liran Einav and Amy Finkelstein. "Moral Hazard in Health Insurance: What We Know and How We Know It," In *Journal of the European Economic Association* 16, no. 4 (2018): 957-982.

¹⁹ Smoke, War: Controlling Escalation, 35.

²⁰ Frank C. Zagare, "The Dynamics of Escalation," in *Information and Decision Technologies* 16, no. 3, (1990), 251. University of Buffalo, NY.

Analysis

Part 1: Moral Hazard

The first mechanism we will consider is the *moral hazard* associated with autonomous and automated platforms. This section will use three contemporary examples to demonstrate how these systems diminish the perceived risks that decision-makers would traditionally weigh, thereby lowering the barriers to crossing Schelling's salient limits of conflict.

A pertinent example of this dynamic occurred in 2023, when a Russian fighter aircraft collided with a U.S. MQ-9 Reaper drone over the Black Sea during the ongoing Russia-Ukraine war, while attempting to dump fuel on the drone's sensors.²¹ As Panter argues, Russian operational commanders likely assessed that damaging an un-crewed drone would not provoke a severe U.S. military response, since no American lives were at risk.²² However, the moral hazard of this situation led to highly provocative, reckless manoeuvres, which ultimately crossed a salient limit: the direct destruction of U.S. military assets. In this case, the reduced concern over personnel risk likely facilitated this escalation, increasing the likelihood of miscalculation and further response.

A similar incident occurred in 2019, when the Iranian Revolutionary Guard Corps destroyed a U.S. RQ-4 Global Hawk conducting surveillance in the Strait of Hormuz. Again, the un-crewed nature of the platform almost certainly factored into the Iranian decision to escalate.²³ According to the Soufan Center, Iranian decision-makers calculated that destroying an un-crewed platform would not escalate the strategic status-quo significantly,²⁴ which proved to be an error of judgement precipitated by moral hazard. The outcome differed significantly to this calculation; U.S. President Trump immediately ordered a retaliatory strike against Iran, cancelling it less than one hour prior to execution due to concerns over vertical escalation and proportionality.²⁵ Instead, the U.S. opted for horizontal escalation into another domain, using cyber-attacks against Iranian radar installations and missile batteries.²⁶ By crossing the salient limit of kinetic action against U.S. forces, Iranian decision-makers triggered an escalatory response that expanded hostilities in an unpredicted way. Both the 2023 Reaper and 2019 Global Hawk incidents therefore demonstrate how automated systems can – through moral hazard – obscure or lower the salient boundaries of conflict, driving political, strategic, and operational leaders toward more provocative and escalatory actions.

²¹ "Russian SU-27 Causes American MQ-9 Reaper Drone to Crash Over Black Sea: US", in *The Defence Post*. March 14, 2023. <https://thedefensepost.com/2023/03/14/russian-jet-us-drone-crash/>

²² Panter, "Naval Escalation in an Unmanned Context."

²³ Jim Garamone, "Iran Shoots Down US Global Hawk Operating in International Airspace," *Press Release*, US Department of Defense. June 20, 2019. <https://www.defense.gov/News/News-Stories/Article/Article/1882497/>

²⁴ 'Intel Brief: The U.S.-Iran Crisis.' The Soufan Centre IntelBrief. Updated Jun 24, 2019. <https://thesoufancenter.org/intelbrief-the-u-s-iran-crisis/>

²⁵ Erin Cunningham and Missy Ryan, "Trump ordered an attack on Iran for downing drone, then called it off" In *The Washington Post*. June 21, 2019. <https://go.gale.com/ps/i.do?id=GALE%7CA589970749&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=01908286&p=AONE&sw=w&userGroupName=anon%7Eaa928ffb&aty=open-web-entry>

²⁶ The Soufan Center, 'IntelBrief.'



There are also instances where the moral hazard associated with automated and autonomous systems has led to *uncontrolled escalation*. On February 10, 2018, an armed Iranian drone launched into Israeli airspace from Syria, and was destroyed.²⁷ Given the reputation of Israel's air defence network, it is highly unlikely that Iran would have taken such a risk with crewed aircraft – i.e. moral hazard was likely a key factor leading to the decision. The Iranian drone was shot down by Israel's air defence system;²⁸

however Israeli leadership determined that this act did not sufficiently deter against future attacks using similar automated platforms, and elected to immediately launch retaliatory strikes against Iranian infrastructure within Syria, targeting the airbase the drone had launched from – crossing another salient limit.²⁹ During these retaliatory strikes, an Israeli F-16 was downed by Syrian surface-to-air missiles, crossing another threshold – kinetic action against crewed platforms – prompting Israel to then strike Syrian air defences and military positions near the population centre of Damascus. This action-reaction cycle continued until Russian intervention eventually de-escalated the exchange.³⁰ Smoke's notion of *uncontrolled escalation* is reflected here in the way that each action pushed the conflict further beyond its previous limits. However, more fundamentally, this example underscores how the moral hazard of automated platforms led to a situation that quickly spiralled out of control.

The three empirical case illustrations in this section all validate Panter's proposition that autonomous and automated weapon systems create a moral hazard in modern warfare, which can result in conflict escalation. By lowering perceived risks, these systems facilitate the crossing of Richard Smoke's salient limits of conflict, thus meeting our definition of an escalatory technology.

Part 2: Machine Error and its Escalatory Potential

The second mechanism contributing to escalation is machine error, and the misinterpretation of adversary intent when such errors occur. As Forrest Morgan et al argue, the complexity of autonomous and automated systems increases the potential for critical errors – such as target misidentification or erroneous recommendations from decision support systems.³¹ This risk is heightened when systems are deployed prior to adequate testing, or become vulnerable to cyberattacks and jamming.³² Such factors introduce significant risks for conflict escalation, as adversaries may interpret machine errors or other unintended actions as deliberate acts of aggression.

²⁷ Schaus and Johnson, "Unmanned Aerial Systems' Influences."

²⁸ Schaus and Johnson, "Unmanned Aerial Systems' Influences."

²⁹ Ely Karmon, "How Serious the Russian Threat to Israel in Syria? A Historical Perspective." In *IPS Publications*. May 2018. 1. <https://www.runi.ac.il/media/02lmakus/elykarmon29-5-18.pdf>

³⁰ Schaus and Johnson, "Unmanned Aerial Systems' Influences."

³¹ Forrest E. Morgan et al. *Military Applications of Artificial Intelligence*, (Santa Monica CA: RAND Corporation, 2020), 140.

https://www.rand.org/content/dam/rand/pubs/research_reports/RR3100/RR3139-1/RAND_RR3139-1.pdf

³² Forrest E. Morgan et al. *Military Applications*. 22.

A key challenge here lies in *attribution*: determining whether an action taken by an autonomous or automated system is a deliberate attack or the result of a malfunction. In high-tension environments, errors are more likely to be perceived as intentional, resulting in increased hostilities. An example of this occurred on July 3, 1988 during the Iran-Iraq war. The automated AEGIS system aboard the USS *Vincennes*, operating in the Persian Gulf, erroneously identified a civilian airliner, Iran Air Flight 655, as an attacking Iranian fighter jet. Despite conflicting data, the crew launched a surface-to-air missile which destroyed the airliner and killed all 290 passengers.³³ Though the U.S. government insisted the incident was accidental, Iranian leaders attributed it to a deliberate act of American aggression, prompting Ayatollah Khomeini to denounce the incident as a 'barbaric massacre,'³⁴ while urging Iranians to 'go to the war fronts and fight against America.'³⁵ Acrimony from this incident continues decades later, with Iranian leaders often making reference to it in anti-U.S. rhetoric.³⁶ This incident illustrates how unintended actions due to errors in automated systems can be easily misinterpreted as deliberate, leading to heightened enmity and escalation.

The Human-Machine Interface and Automation Bias

It is important to recognise that error and unintended actions are not unique to automated and autonomous systems. To consider this technology escalatory, it is necessary to demonstrate that these systems possess *unique* characteristics that make errors more dangerous. While automation aims to improve precision and reduce the rate of *human error*, it also shifts the human role from active control to passive monitoring.³⁷ According to Mouloua, This shift creates a critical vulnerability, as humans are less adept at detecting rare or unpredictable errors when disengaged from direct control.³⁸ Moreover, operators tend to place excessive trust in automated systems, which reduces their readiness to intervene when necessary; a phenomenon described as *automation complacency* or *automation bias*.³⁹

Automation bias has been widely observed in industries like aviation and nuclear power. A clear illustration of its dangers occurred in 1972, when Eastern Airlines Flight 401 crashed due to a faulty landing gear indicator light that distracted the crew.⁴⁰ As they focused on troubleshooting the minor issue, they failed to notice that autopilot had initiated a slow descent, which continued until the aircraft impacted the Florida everglades, killing 101 passengers.⁴¹ This incident highlights how human reliance on automation can lead to lapses in attention, with errors leading to catastrophic outcomes. In a military context, such lapses could be even more dangerous, particularly when

³³ Nick Danby, "How the downing of Iran Air flight 655 still sparks US-Iran enmity," in *Responsible Statecraft*, 02 July, 2021. <https://responsiblestatecraft.org/2021/07/02/how-the-downing-of-iran-air-flight-655-still-influences-us-iran-enmity/>

³⁴ Nick Danby, "How the downing of Iran Air flight 655 still sparks US-Iran enmity."

³⁵ Nick Danby, "How the downing of Iran Air flight 655 still sparks US-Iran enmity."

³⁶ Hassan Rouhani (@Hassan Rouhani), Tweet regarding IR655, January 7, 2020. <https://x.com/hassanrouhani/status/1214236608196685824?lang=en>

³⁷ Mustapha Mouloua, and Peter Hancock, *Human performance in automated and autonomous systems, current theory and methods*, (CRC Press, 2020). 104.

³⁸ Mouloua & Hancock, *Human performance in automated and autonomous systems*, 104.

³⁹ Mouloua & Hancock, *Human performance in automated and autonomous systems*, 104.

⁴⁰ "Accident Report: Eastern Airlines Flight 401, N310EA." Federal Aviation Administration. Accessed September 20, 2024.

https://www.faa.gov/lessons_learned/transport_airplane/accidents/N310EA

⁴¹ "Accident Report: Eastern Airlines Flight 401."

adversaries can misinterpret unintended actions as deliberate and escalatory.

Research by Robert Arrabito et al. supports this view, identifying human factors as playing a major role in operational mishaps involving automated military platforms.⁴² Arrabito argues that human supervisors must maintain high levels of vigilance to address errors, especially during long-endurance missions. When this vigilance falters – due to fatigue or automation bias – errors go undetected, exposing critical vulnerabilities in the system.⁴³ Furthermore, Andre Haider highlights that the human-machine interface in partially automated drones is also susceptible to disruption through datalink failures, equipment malfunctions, or cyberattacks and jamming.⁴⁴ Together, these factors demonstrate the potential for critical errors emerging in the context of automated or autonomous platforms – and thus the potential for inadvertent escalation – is significant.

Automation and Error - Counterarguments

Critics may argue that automated systems are designed specifically to reduce error – by addressing human weaknesses such as fatigue and cognitive bias – and should therefore be less escalatory than platforms under more direct human control. However, this argument overlooks the complexity of automated and autonomous operations, and mistakenly focuses on the *rate of error* as the most important metric to consider. A more relevant measure for assessing escalatory risk is the *severity and number* of errors which *go undetected* due to inadequate human oversight, leading to more serious consequences.

By this measure, Shayne Longpre et al. argue that automation technology has a particularly poor record, as human supervision over machines is particularly unreliable and ‘rife with unsolved challenges.’⁴⁵ This is seen even in the most advanced systems; according to Yuval Abraham, some of the most sophisticated autonomous military technologies today still exhibit error rates as high as 10%, with many of these errors going undetected by human supervisors due to automation bias, leading in some cases to severe outcomes such as the unintended targeting of civilians.⁴⁶



⁴² Robert Arrabito et al. *Human Factors Issues for Controlling Uninhabited Aerial Vehicles*, (Toronto: Defence R&D Center, 2010), i. <https://apps.dtic.mil/sti/pdfs/ADA543186.pdf>

⁴³ Arrabito et al. *Human Factors Issues for Controlling Uninhabited Aerial Vehicles*.

⁴⁴ Andre Haider, “The Vulnerabilities of Unmanned Aircraft Systems Components.” In *A Comprehensive Approach to Countering Unmanned Aircraft Systems*, Joint Air Power Competence Center, January 2021. <https://www.japcc.org/chapters/c-uas-the-vulnerabilities-of-unmanned-aircraft-system-components/#data-link>

⁴⁵ Shayne Longpre, Marcus Storm and Rishi Shah, “Lethal autonomous weapons systems and artificial intelligence: Trends, challenges and policies,” in *MIT Science Policy Review*, Vol 3. August 29, 2022. 49.

⁴⁶ Yuval Abraham, “A Mass Assassination Factory: Inside Israel’s Calculated Bombing of Gaza,” In *+972 Magazine*, 30 November 2023, <https://www.972mag.com/mass-assassination-factory-israel-calculated-bombing-gaza/>.

Still, there are other sources of error unique to automated and autonomous systems that are likely to increase the intensity of conflict. The 44-day war between Armenia and Azerbaijan over Nagorno-Karabakh in 2020 illustrated how the pairing of humans and automated drones can drive errors resulting in unintended outcomes. Izabella Khachatryan attributes these errors to phenomena such as the 'soda straw' effect (tunnel-vision caused by the narrow field of view of a drone's camera), and the 'data crush' effect (overload of sensor data overwhelming operators).⁴⁷ Due to these sources of error across the human-machine interface, Azerbaijani forces, using UAVs, struggled to apply the warfare principles of *proportionality* and *distinction*, leading to errors resulting in the indiscriminate targeting in civilian areas, raising tensions between the two sides.⁴⁸ This escalation prompted reciprocal and reactionary munition strikes against population centres, a reactionary cycle which was only de-escalated upon the arrival of international peacekeeping forces.⁴⁹

The Nagorno-Karabakh war demonstrated how the errors in these systems triggered a breach of the salient limits of conflict, while also blurring the distinction between intentional and unintentional actions – a dynamic demonstrated in the aftermath of the Iran Air 655 incident. These dynamics, together with factors such as automation complacency – as seen in the Eastern Airlines accident – illustrate that automation can be inherently unpredictable. Further, the potential for unpredictable actions to be misinterpreted in a time of tension, demonstrates the potential for inadvertent escalation associated with these technologies.

Part 3: Autonomous Systems and Command and Control

The third mechanism contributing to escalation involves the temporal acceleration of warfare when autonomous systems are integrated into Command and Control (C2) frameworks. By increasingly delegating critical military decisions to machines, this shift fundamentally alters the nature and pace of decision-making in conflict, introducing significant escalatory tendencies. Near-autonomous decision-support systems, such as Israel's 'Gospel',⁵⁰ 'Lavender',⁵¹ and 'Where's Daddy',⁵² are examples of AI-driven technology that far surpass human-driven processes in both speed and volume of target generation. By rapidly processing vast amounts of surveillance and intelligence data, these platforms have reshaped the pace of conflict. As Elke Schwartz observes, integration of such systems has made 'the process of killing progressively more autonomous,' by reducing human deliberation and reflection in critical moments.⁵³

⁴⁷ Izabella Khachatryan, *The accuracy level of targeted killings by UAVs*. (Montrose CA: Center for Truth and Justice, 2022). <https://www.cftjustice.org/the-accuracy-level-of-targeted-killings-by-uavs-retrospective-to-nk-war-in-2020-is-the-usage-of-drones-legal-during-armed-conflicts-considering-the-high-risk-of-disproportionate-collateral-damage/>

⁴⁸ Khachatryan, *The accuracy level of targeted killings by UAVs*.

⁴⁹ Khachatryan, *The accuracy level of targeted killings by UAVs*.

⁵⁰ Yuval Abraham, "A Mass Assassination Factory."

⁵¹ Yuval Abraham, "'Lavender': The AI machine directing Israel's bombing spree in Gaza." In +972 Magazine. April 3, 2024. <https://www.972mag.com/lavender-ai-israeli-army-gaza/>

⁵² Rohit Kumar Sharma, "Human-in-the-loop Dilemmas: The Lavender System in Israel Defence Force Operations." In *Journal of Defence Studies*, Vol. 18, No. 2., April-June 2024. 166-175.

⁵³ Elke Schwartz, 'Gaza War: Israel Using AI to Identify Human Targets Raising Fears That Innocents Are Being Caught in the Net', *The Conversation*, 12 April 2024. <https://theconversation.com/gaza-war-israel-using-ai-to-identify-human-targets-raising-fears-that-innocents-are-being-caught-in-the-net-227422>.

A clear example of this dynamic is seen in the 2023-2024 Gaza conflict, where the Lavender system generated over 37,000 potential targets in its first days by rapidly processing vast amounts of surveillance data. The significant volume of targets drove a reduction in the time allocated to human reviews to approximately 20 seconds per target – barely enough for a human to confirm a target's gender – before authorising a strike.⁵⁴ While this rapid decision-making may minimise indecisiveness and delays associated with human 'bottlenecks',⁵⁵ it also diminishes crucial opportunities for humans to carefully consider their decisions and exercise restraint.

These opportunities for restraint have been historically important. In contrast to AI-driven C2 systems like Lavender, which enable approval of thousands of strikes in seconds, historical incidents such as the 1962 Cuban Missile crisis,⁵⁶ the 1983 Able Archer Incident,⁵⁷ and the 1999 Kargil Conflict⁵⁸ were characterised by slower, controlled decision-making processes that allowed time for critical human deliberation and restraint. In these instances, the human 'bottlenecks' provided essential opportunities for discussion, diplomatic intervention, and ultimately de-escalation. These opportunities appear to be rapidly diminishing as AI-enabled tools accelerate targeting decisions.

This acceleration of decision-making also compounds with machine error, especially in the algorithmic decision-making associated with systems such as Lavender. According to Yuval Abraham, Lavender's error rate is as high as 10%, and in some cases, the system has recommended strikes on low-level targets with as many as 20 civilians in close proximity – collateral damage deemed acceptable by the algorithm.⁵⁹ The apparent delegation of human moral and ethical considerations to rapid, algorithmic decision-making is concerning, as situations where autonomous systems like Lavender accept high levels of collateral damage as an efficient trade-off may set the scene for reactionary cycles of vengeance. This could increase the likelihood of uncontrolled vertical escalation.

Yet another factor that may accelerate escalation is the impact of these AI decisions on rational adversary behaviour. When rivals perceive that decisions are being made without human restraint, they may conclude that the salient limits of conflict have fundamentally changed. Zagare's application of game theory, specifically the *prisoner's dilemma* scenario, can be applied here to demonstrate how the perception that human restraint is diminished may lead rational adversaries to escalate conflicts pre-emptively.⁶⁰ The fear that restraint could increase vulnerability may drive more aggressive decisions, thus intensifying conflict. This could further accelerate warfare, pushing all actors toward exceeding Schelling's salient limits of behaviour in conflict.

The transformation of warfare through automation of C2 systems underscores the urgent

⁵⁴ Yuval Abraham, "Lavender."

⁵⁵ Yuval Abraham, "Lavender."

⁵⁶ "The Cuban Missile Crisis, October 1962," Office of the Historian, United States State Department. Accessed September 20, 2024. <https://history.state.gov/milestones/1961-1968/cuban-missile-crisis>

⁵⁷ Beyza Unal et al. *Uncertainty and Complexity in Nuclear Decision Making*, (London: Chatham House Publishing, March 2022).

⁵⁸ Edward Wise, "Brinkmanship in the Kargil Heights: A Study of Escalation and Restraint during the 1999 Kargil conflict." Leiden University Repository, Accessed 20 Sep, 21. <https://studenttheses.universiteitleiden.nl/access/item%3A2701698/view>

⁵⁹ Yuval Abraham, "Lavender."

⁶⁰ Frank Zagare, "The Dynamics of Escalation," 251.

need to address the escalatory risks posed by such technologies. While speed and efficiency are operationally advantageous, they diminish human oversight and shrink decision-making windows that are necessary for de-escalation. Though this section has focused on Israeli technology, the widespread development of AI-driven C2 systems by the U.S Department of Defense (e.g. *Project Maven*)⁶¹ and China's PLA research and development programs⁶² indicates that these trends are global. In great-power conflicts, where the stakes are exponentially higher, the potential for uncontrolled vertical escalation due to this mechanism is particularly alarming. Therefore, mitigating the risks of autonomous decision-support systems in military command and control architectures should be considered a global priority.

Part 4: How Australia Might Contribute to Contemporary Escalation Management

Having demonstrated the uniquely escalatory tendencies of autonomous and automated weapon systems – including moral hazard, machine error, and the acceleration of warfare - this section explores how middle powers such as Australia might implement strategies to mitigate these dangers. It will argue that due to its strong regional and global standing, Australia is well-positioned to play an important role in managing escalation in the context of automated warfare. This section outlines three potential avenues: Through operational strategies, international agreements, and crisis communication channels.

Operational Strategies

One of the most effective ways Australia might address the escalatory potential of automated systems is by adopting operational strategies focused on de-escalation. For instance, autonomous systems could be deployed in non-lethal conflict roles, such as using electronic warfare drones to disrupt enemy communications, deterring adversaries from attempting direct confrontation.⁶³ Similarly, automated command and control (C2) systems, akin to Lavender, could be adapted for less escalatory purposes: Instead of targeting individuals, these systems could be trained to identify and disrupt logistical vulnerabilities, such as military supply chains or military infrastructure.⁶⁴ This approach would allow Australia to impose significant costs on any hypothetical aggressor, deterring escalation without adopting an overly threatening posture.

Additionally, Australia could devise operational concepts for using autonomous platforms in humanitarian and disaster relief efforts. AI-powered C2 systems could assist in needs assessments, while automated platforms could deliver aid or clear land and sea mines in war-torn regions.⁶⁵ The use of drones for surveillance within UN peacekeeping operations exemplifies how these platforms could be employed in innovative ways that

⁶¹ Katrina Manson, "AI Warfare is Already Here," in Bloomberg. February 28, 2024. <https://www.bloomberg.com/features/2024-ai-warfare-project-maven/>

⁶² Christina Larson, "China's massive investment in artificial intelligence has an insidious downside," in Science, February 8, 2018. <https://www.science.org/content/article/china-s-massive-investment-artificial-intelligence-has-insidious-downside>

⁶³ Gabriel Honrada, "AUKUS ground robots pass hot electronic war test," in *The Asia Times*, February 8, 2024. <https://asiatimes.com/2024/02/aukus-ground-robots-pass-hot-electronic-war-test/>

⁶⁴ Jason Wolff, *The Department of Defense's digital logistics are under attack*, (Washington DC: The Brookings Institute, July 2023). <https://www.brookings.edu/articles/the-department-of-defenses-digital-logistics-are-under-attack/>

⁶⁵ Keirissa Lawson, *New Technology for Landmine Clearance*, (Canberra: CSIRO, April 4, 2023). <https://www.csiro.au/en/news/all/articles/2023/april/landmine-clearance>

avoid the escalatory tendencies identified in the previous section.⁶⁶ Finally, operational contingency plans should incorporate de-escalatory pathways to ensure unexpected machine errors or system malfunctions are not misinterpreted. By establishing pre-agreed crisis management protocols with both allies and adversaries, and considering carefully how the Australian Defence Force employs automated and autonomous systems, Australian military planners could reduce the likelihood of confusion and miscalculation in moments of crisis.

Crisis Communication Channels

Beyond operational strategies, Australia could advocate for (and pursue) enhancements to crisis communication mechanisms between nations. Historically, dedicated 'hot-lines' have played a crucial role in de-escalation during crises.⁶⁷ However, considering the acceleration of warfare identified in this paper, there may be a need to broaden these communication mechanisms to sub-political levels, potentially extending to the operational levels of militaries. This would facilitate more timely opportunities to clarify intent, and more opportunities to resolve misunderstandings in real-time, thus stabilising tense situations. These communication mechanisms would be particularly useful in scenarios where automated systems such as drones or autonomous sub-surface assets are involved in near-miss incidents or other ambiguous situations.

International Agreements and Controls

Australia could also review its approach toward international controls and treaties associated with automated and autonomous weapon systems. As Jonosch Delcker highlights, Australia has historically opposed international efforts to regulate these technologies.⁶⁸ However, as a contracted party to the UN Convention on Certain Conventional Weapons (CCW), Australia could, under Article 8 (2)(a) of the Convention, propose a new protocol addressing autonomous systems – a category not yet covered by existing CCW protocols.⁶⁹ Given the growing recognition of the escalatory risks posed by these systems, and particularly amid more frequent and intense flashpoints, it would be prudent for Australian policymakers to explore this option.

A growing number of nations are now seeking treaties or agreements to regulate the use of autonomous and automated weapons,⁷⁰ and Australia's endorsement could significantly bolster these global efforts. Historically, such treaties have had some success in curtailing the spread of destructive technologies, such as cluster munitions,

⁶⁶ Kelly A. Grieco, *What Can UN Peacekeeping Learn from Ukraine's Drones?*, (Washington DC: The Henry L. Stimson Center, 2023).

⁶⁷ Stephen E. Miller, "Nuclear Hotlines: Origins, Evolution, Applications," in *Analysis and New Insights*, Stanley Center for Peace and Security, October 2020, 5.

⁶⁸ Janosch Delcker, "How Killer Robots Overran the UN," in *Politico*, February 12, 2019. <https://www.politico.eu/article/killer-robots-overran-united-nations-lethal-autonomous-weapons-systems/>

⁶⁹ United Nations, *The Convention on Certain Conventional Weapons*, (Geneva: The United Nations Office of Disarmament Affairs, October 10, 1980). <https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/>

⁷⁰ Michael T. Klare, "Strong Support at Conference for 'Killer Robot' Regulation." In *Arms Control Today*. June 2024. <https://www.armscontrol.org/act/2024-06/news/strong-support-conference-killer-robot-regulation>

landmines, and nuclear weapons.⁷¹ While Australia's relatively small population and vast territory to defend may create incentives to maintain and develop automated and autonomous capabilities for deterrence,⁷² Its political standing uniquely positions it to *lead* global efforts to establish norms and standards around these technologies.

These agreements could address the escalatory risk in a number of ways. For example, by emphasising the importance of *human accountability* for the actions of automated and autonomous platforms, regulation could potentially address issues relating to moral hazard. Furthermore, by promoting transparency and confidence-building measures supporting the acquisition and employment of automated platforms, Australia could help reduce the likelihood of fear and miscalculation. Similarly, by advocating for enhancements to international crisis management frameworks, Australia's efforts could open windows for de-escalation at a time when technology is shrinking them. Collectively, these approaches could achieve significant headway in reducing risks, even if establishing a fully comprehensive treaty remains challenging due to diverse interests of global powers.

However, as Laura Varella highlights, the rapid pace of technological development in the current era complicates the creation of effective international agreements. The dynamics of Zagares' prisoner's dilemma⁷³ – where nations are incentivised to race for technological superiority – are now particularly pronounced among major military powers vying for technological dominance. Thus, as an interim measure, Australian efforts might be best targeted at achieving non-binding codes of conduct or voluntary agreements as intermediate steps toward more formal treaties.

Conclusion

The introduction of automated and autonomous systems in modern warfare has fundamentally transformed – and continues to transform – the landscape of conflict. This analysis has underscored the critical role that these technologies play in shaping escalation dynamics, driven by factors such as moral hazard, attribution of errors emerging from the human-machine interface, and the acceleration of warfare due to autonomous decision-making.

By examining illustrative incidents such as the destruction of U.S. Global Hawk and Reaper drones, and the Iran-Israel escalation in 2018, this paper has demonstrated that the moral hazard associated with autonomous and automated systems can lead decision makers to exceed the established thresholds of conflict. Furthermore, case examples on human-machine error, including the downing of Iran Air Flight 655 and the Nagorno-Karabakh conflict, illustrate how the errors associated with automated and autonomous systems, and the difficulty in determining the intent behind unexpected actions, can drive unintended escalation.

Moreover, this paper has highlighted how automated command and control (C2) systems, exemplified by Israel's Lavender and Gospel systems, can increase the risk of

⁷¹ Laura Varella, "Building Momentum to Ban AWS," in *AWS Diplomacy Report 1*, No. 1. May 7, 2024. <https://reachingcriticalwill.org/images/documents/Disarmament-fora/other/aws/2024-vienna/reports/AWSR1.1.pdf>

⁷² Commonwealth of Australia, *National Defence Strategy 2024*. (Canberra: Australian Government – Defence, 2024). 57.

⁷³ Frank Zagare, "The Dynamics of Escalation," 251. <https://reachingcriticalwill.org/images/documents/Disarmament-fora/other/aws/2024-vienna/reports/AWSR1.1.pdf>

rapid escalation by accelerating the conduct of warfare, diminishing human oversight and eliminating critical opportunities for diplomatic de-escalation. Thus, while these systems may enhance operational efficiency, they significantly raise the prospect of intensifying conflict.

The argument presented herein asserts that modern autonomous and automated weapon systems are uniquely destabilising and escalatory. While the empirical case illustrations presented here clearly support this argument, they also raise an essential question for further investigation: As Australia modernises its defence capabilities and strategy, how can it carefully weigh the operational benefits of automated and autonomous weapon systems against the imperative of escalation management in an increasingly tense geopolitical environment? This paper has briefly outlined potential pathways to achieving this balance through a combination of operational strategies, crisis communication channels, and by fostering greater international cooperation.

This final area warrants continued policy discussion and research. By reconciling the advantages of automation with the need for robust escalation control mechanisms, Australia may help ensure a more secure future in an increasingly automated world. Thoughtful engagement with international diplomacy, along with the development of robust crisis communication protocols, will be essential as Australia navigates the complexities of the global security environment in the 21st century.

References

Abraham, Yuval., "Lavender': The AI machine directing Israel's bombing spree in Gaza." In *+972 Magazine*. April 3, 2024. <https://www.972mag.com/lavender-ai-israeli-army-gaza/>

Abraham, Yuval., "A Mass Assassination Factory: Inside Israel's Calculated Bombing of Gaza," In *+972 Magazine*, 30 November 2023, <https://www.972mag.com/mass-assassination-factory-israel-calculated-bombing-gaza/>.

Arrabito, Robert., Ho, Geoffrey., Lambert, Annie., Rutley, Mark., Keillor, Jocelyn., Chiu, Allison., Au, Heidi., and Ming Hou. *Human Factors Issues for Controlling Uninhabited Aerial Vehicles*, (Toronto: Defence R&D Center, 2010), i. <https://apps.dtic.mil/sti/pdfs/ADA543186.pdf>

CNA Center for Autonomy and IA, "Impact of Unmanned Systems on Escalation Dynamics," Accessed September 20, 2024. https://www.cna.org/archive/CNA_Files/pdf/summary-impact-of-unmanned-systems-to-escalation-dynamics.pdf

Commonwealth of Australia, *National Defence Strategy 2024*. Canberra: Australian Government – Defence, 2024.

Cunningham, Erin and Missy Ryan, "Trump ordered an attack on Iran for downing drone, then called it off" In *The Washington Post*. June 21, 2019. <https://go.gale.com/ps/i.do?id=GALE%7CA589970749&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=01908286&p=AONE&sw=w&userGroupName=anon%7Eaa928ffb&aty=open-web-entry>

Danby, Nick., "How the downing of Iran Air flight 655 still sparks US-Iran enmity," in *Responsible Statecraft*, 02 July, 2021. <https://responsiblestatecraft.org/2021/07/02/how-the-downing-of-iran-air-flight-655-still-influences-us-iran-enmity/>

Delcker, Janosch., "How Killer Robots Overran the UN," in *Politico*, February 12, 2019. <https://www.politico.eu/article/killer-robots-overran-united-nations-lethal-autonomous-weapons-systems/>

Einav, Liran., and Amy Finkelstein. "Moral Hazard in Health Insurance: What We Know and How We Know It," In *Journal of the European Economic Association* 16, no. 4 (2018).

Federal Aviation Administration., "Accident Report: Eastern Airlines Flight 401, N310EA." Accessed September 20, 2024. https://www.faa.gov/lessons_learned/transport_airplane/accidents/N310EA

Garamone, Jim., "Iran Shoots Down US Global Hawk Operating in International Airspace," *Press Release*, US Department of Defense. June 20, 2019. <https://www.defense.gov/News/News-Stories/Article/Article/1882497/>

Grieco, Kelly, A., "What Can UN Peacekeeping Learn from Ukraine's Drones?" (Washington: The Henry L. Stimson Center, 2023). <https://www.stimson.org/2023/what-can-un-peacekeeping-learn-from-ukraines-drones/#:~:text=UN%20missions%20can%20also%20use,displaced%20people%20in%20conflict%20zones.>

Heider, Andre., "The Vulnerabilities of Unmanned Aircraft Systems Components." In *A Comprehensive Approach to Countering Unmanned Aircraft Systems*, Joint Air Power Competence Center, January 2021. <https://www.japcc.org/chapters/c-uas-the-vulnerabilities-of-unmanned-aircraft-system-components/#data-link>

Honrada, Gabriel., "AUKUS ground robots pass hot electronic war test," in *The Asia Times*, February 8, 2024. <https://asiatimes.com/2024/02/aukus-ground-robots-pass-hot-electronic-war-test/>

Kahn, Herman., *On Metaphors, Escalation and Scenarios*, (New York: Routledge, 1962).

Karmon, Ely., "How Serious the Russian Threat to Israel in Syria? A Historical Perspective." In *IPS Publications*. May 2018. 1. <https://www.runi.ac.il/media/02lmakus/elykarmon29-5-18.pdf>

Khachatryan, Izabella., *The accuracy level of targeted killings by UAVs*. (Montrose CA: Center for Truth and Justice, 2022). <https://www.cftjustice.org/the-accuracy-level-of-targeted-killings-by-uavs-retrospective-to-nk-war-in-2020-is-the-usage-of-drones-legal-during-armed-conflicts-considering-the-high-risk-of-disproportionate-collateral-damage/>

Klare, Michael T., "Strong Support at Conference for 'Killer Robot' Regulation." In *Arms Control Today*. June 2024. <https://www.armscontrol.org/act/2024-06/news/strong-support-conference-killer-robot-regulation>

Larson, Christina., "China's massive investment in artificial intelligence has an insidious downside," in *Science*, February 8, 2018. <https://www.science.org/content/article/china-s-massive-investment-artificial-intelligence-has-insidious-downside>

Lawson, Keirissa., *New Technology for Landmine Clearance*, (Canberra: CSIRO, April 4, 2023). <https://www.csiro.au/en/news/all/articles/2023/april/landmine-clearance>

Lin-Greenberg, Erik., "Wargame of Drones: Remotely Piloted Aircraft and Crisis Escalation," in *Journal of Conflict Resolution* 66, No. 10 (2022). <https://journals.sagepub.com/doi/10.1177/00220027221106960>

Lipsky, Phillip Y., and Haillie Na-Kyung Lee. "The IMF as a biased global insurance mechanism: Asymmetrical moral hazard, reserve accumulation, and financial crises." In *International Organization* 73, no. 1 (2019).

Longpre, Shayne., Storm, Marcus., and Rishi Shah, "Lethal autonomous weapons systems and artificial intelligence: Trends, challenges and policies," in *MIT Science Policy Review*, Vol 3. August 29, 2022. https://sciencepolicyreview.org/wp-content/uploads/securepdfs/2022/10/v3_AI_Defense-1.pdf

Manson, Katrina., "AI Warfare is Already Here," in *Bloomberg*. February 28, 2024. <https://www.bloomberg.com/features/2024-ai-warfare-project-maven/>

Merriam-Webster, 'Moral Hazard', Accessed September 20, 2024. <https://www.merriam-webster.com/dictionary/moral%20hazard>

Miller, Stephen E., "Nuclear Hotlines: Origins, Evolution, Applications," in *Analysis and New Insights*, Stanley Center for Peace and Security, October 2020.

Morgan Forrest E., Mueller, Karl P., Medeiros, Evan S., Pollpeter, Kevin L., and Roger Cliff. "The Nature of Escalation," In *Dangerous Thresholds: Managing Escalation in the*

21st Century, 1st ed., 7–46. RAND Corporation, 2008.
<http://www.jstor.org/stable/10.7249/mg614af.9>

Morgan, Forrest E., Boudreaux, Benjamin, Lohn, Andrew, Ashby, Mark, Curriden, Christian, Klima, Kelly and Derek Grossman. *Military Applications of Artificial Intelligence*, (Santa Monica CA: RAND Corporation, 2020), 140.
https://www.rand.org/content/dam/rand/pubs/research_reports/RR3100/RR3139-1/RAND_RR3139-1.pdf

Mouloua, Mustapha and Peter Hancock., *Human performance in automated and autonomous systems, current theory and methods* (CRC Press, 2020). 104.

Panter, Jonathan. “Naval Escalation in an Unmanned Context,” in *CIMSEC*, April 26, 2023. <https://cimsec.org/naval-escalation-in-an-unmanned-context/>

Rattray, Gregory J., “Explaining Weapons Proliferation: Going beyond the Security Dilemma,” in USAF Academy Institute for National Security Studies, FNSS Occasional Papers, no. 1 (2016). <https://irp.fas.org/threat/ocp1.htm>

Roff, Heather., “Distinguishing autonomous from automatic weapons,” in Bulletin of the Atomic Scientists. February 9, 2016.
https://thebulletin.org/roundtable_entry/distinguishing-autonomous-from-automatic-weapons/

Schaus, John and Kaitlyn Johnson, “Unmanned Aerial Systems’ Influences on Conflict Escalation Dynamics,” In *CSIS Briefs*, August 2, 2018.
<https://www.csis.org/analysis/unmanned-aerial-systems-influences-conflict-escalation-dynamics>

Schelling, Thomas C., *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960).

Schwartz, Elke., ‘Gaza War: Israel Using AI to Identify Human Targets Raising Fears That Innocents Are Being Caught in the Net’, *The Conversation*, 12 April 2024.
<https://theconversation.com/gaza-war-israel-using-ai-to-identify-human-targets-raising-fears-that-innocents-are-being-caught-in-the-net-227422>.

Sharma, Rohit Kumar., “Human-in-the-loop Dilemmas: The Lavender System in Israel Defence Force Operations.’ In *Journal of Defence Studies*, Vol. 18, No. 2., April-June 2024. 166-175.

Shoaib, Muhamad and Ruman Rabeet, ‘The Enron Scandal and Moral Hazard,’ in *SSRN Electronic Journal*, January 2012. DOI:10.2139/ssrn.1987424

Smoke, R., *War: Controlling Escalation* (Cambridge MA: Harvard University Press, 1977).

Soufan Centre, “Intelligence Brief: The U.S.-Iran Crisis.” Updated Jun 24, 2019.
<https://thesoufancenter.org/intelbrief-the-u-s-iran-crisis/>

The Defense Post, “Russian SU-27 Causes American MQ-9 Reaper Drone to Crash Over Black Sea: US”, published in *The Defence Post*. March 14, 2023.
<https://thedefensepost.com/2023/03/14/russian-jet-us-drone-crash/>

United Nations, *The Convention on Certain Conventional Weapons*, (Geneva: The United Nations Office of Disarmament Affairs, October 10, 1980).
<https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/>

Varella, Laura., "Building Momentum to Ban AWS," in *AWS Diplomacy Report* 1, No. 1. May 7, 2024. <https://reachingcriticalwill.org/images/documents/Disarmament-fora/other/aws/2024-vienna/reports/AWSR1.1.pdf>

Wolff, Jason., *The Department of Defense's digital logistics are under attack*, (Washington DC: The Brookings Institute, July 2023).
<https://www.brookings.edu/articles/the-department-of-defenses-digital-logistics-are-under-attack/>

Zagare, Frank C., "The Dynamics of Escalation," in *Information and Decision Technologies* 16, no. 3, (1990). University of Buffalo, NY.



Perspectives – the Defence Strategic Review and the Implications for Force Design

This section focusses on translating strategy into capability and offers the best essays from students of the Military Art Part Time program that address the question:

Has the 2023 Defence Strategic Review provided the broad force design needed for the demands of the next two decades?

Case Study 1 - Wing Commander Kelly Chan

Wing Commander Kelly Chan is an Aviation Electrical Engineer and graduate of the Australian Command and Staff Course (Military Art)–Part Time (formally ACSC-Remote) class of 2024. She is current posted to Air Force Headquarters in Canberra, where she leads Air Combat Program governance.

Case Study 2 - Major Matthew Jones

Major Matthew Jones is an Army Reserve infantry officer and Paediatric Surgeon currently serving as SO2 Strategic Analysis at the Australian Army Research Centre. He has commanded at a Company level, posted as an instructor on the Combat Officers' Advanced Course, and deployed on multiple domestic operations. A recent graduate of the Australian Command and Staff Course, he holds a PhD in paediatric surgery, a Doctor of Medicine and a Master of Surgery, among other qualifications. His current research focuses on the Defence of Australia.

Case Study 3 – Major Daniel Roberts

Major Danny Roberts is an Infantry Officer and graduate of the Australian Command and Staff Course (Military Art)-Part Time (formally ACSC-Remote) class of 2024. He is currently posted to the Defence People Group, where he works in Reserve Officer Career Management – Army.

Editorial Note: These papers were written prior to the release of the 2024 National Defence Strategy.

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Case Study 1

The purpose of the *Defence Strategic Review* (DSR) of 2023 is to optimise Defence capability and posture to meet the security challenges facing Australia over the next two decades and beyond.¹ Shaping and optimising the combat power of the ADF involves identifying the current and emerging strategic risks that will require an ADF operational response, developing posture and preparedness settings, and prioritising Defence spending on the force structures and capability options aligned to meeting the challenges of Australia's strategic circumstances. This paper will contend that by focussing the force design and investment priorities on the highest strategic risk, the prospect of major conflict in our region, the DSR has left gaps in responding to the most likely strategic risk related to the impacts of climate change. As a result of these gaps, the force design will be misaligned to the full scope of demands the ADF will face in the coming decades.

Bateman and Bergin's definition of the major elements of climate change risk to national security will be used as a framework for considering the DSR's success or otherwise in identifying, assessing and addressing the risks and demands posed to Defence by climate change. Bateman and Bergin identify four key themes of climate change risk to national security. Firstly, militaries are polluters and there need for militaries to reduce their emissions and impacts on climate change. Secondly, climate change has direct impacts on the roles and missions of militaries, with increasing participation in Humanitarian Assistance and Disaster Relief (HADR) becoming routine for militaries across the globe. Thirdly, climate change has an impact as a threat multiplier, exacerbating social, economic and political vulnerabilities and contributing to instability and potential conflict. Lastly, increasing variabilities and extremities of weather, temperature and sea-level have direct impacts on Defence estate, training, activities and supporting infrastructure.²

Defence's contribution as a polluter has been largely addressed and will not be considered further in this paper. Defence briefed the incoming Government in 2022 on a range of investments to drive a 43 per cent reduction in Greenhouse Gas Emissions by 2030 and achieve net zero by 2040.³ The DSR further identifies the need to accelerate the Defence transition to clean energy and outlines a plan to be presented to Government by 2025.⁴ The remaining three factors will be evaluated by firstly looking at climate change impacts in the Pacific region and the failure of the DSR to fully address expected climate related demands on the ADF in maintaining the regional stability critical to Australia's national security. Secondly, the use of the ADF in support of domestic disaster relief and recovery support will be reviewed, contending that it is unrealistic for Defence to distance itself from this role given the predicted increasing frequency and intensity of natural disaster events and lack of suitable response alternatives available to Government in the short term. Lastly, the gaps associated with climate change impacts on the DSR's pivot to the north will be identified, considering the risks to Defence estate,

¹ Australian Government - Department of Defence, *National Defence: Defence Strategic Review*, 2023, 12.

² S. Bateman and A. Bergin, *Naval, National Security and Defence Issues from Climate Change*, Research Handbook on Climate Change, Oceans and Coasts (Edward Elgar Publishing Ltd., 2020), 409–424, <https://doi.org/10.4337/9781788112239.00030>.

³ Australian Government: Department of Defence, "Incoming Government Brief (Declassified)," September 2022, 76, https://www.defence.gov.au/sites/default/files/2022-09/514_2122_documents.pdf.

⁴ Australian Government - Department of Defence, *National Defence: Defence Strategic Review*, 41.

infrastructure, training and activities.

Climate change impacts in the Pacific

Climate change effects in the Pacific will create significant demands on the ADF over the coming decades. Climate change remains the single greatest threat to the security of the Blue Pacific Continent⁵ and ADF operations will be impacted by both the first order effects of climate change, and climate change as a threat multiplier of existing vulnerabilities in traditional security concerns. The increasing frequency and intensity of extreme weather events and natural disasters can be expected to create increased requests for HADR from Australia as a regional leader. The higher order effects of climate change creating regional instabilities such as food insecurity, population migration, territorial disputes, political and economic instability, increase the likelihood of ADF involvement in peacekeeping operations in the region or related tasks such as bolstering the capacity of Australian Border Force in protecting Australia's borders from climate migration.⁶ The increasing occurrences of environmental and political instability as a result of climate change in the Pacific region will almost certainly translate into an increasing demand on the ADF to provide response options for Government in support of HADR and stability operations.

Beyond the tacit expectations of support from Australia as part of the Pacific family, the Australian Government has undertaken formal security commitments in the region to provide disaster relief and protection from military aggression, which would have severe political ramifications if not met. A salient example is the *Falepili Union treaty* with Tuvalu, in which Australia has committed to supporting migration of the Tuvaluan population as they are displaced by rising sea levels, but also providing assistance to Tuvalu in the event of a natural disaster, public health emergency or military aggression.⁷ Conceivably, all three of these scenarios could result in an ADF tasking. Questions have been raised about the ADF's capability to support a defence guarantee for Tuvalu, with Graham and Shrimpton suggesting the ADF difficulties in sustaining recent HADR operations in Tonga present a poor indicator of a credible response in Tuvalu.⁸ Whilst Australia's primary motivation for the agreement seems to be to deny China a security foothold in the region, the HADR and defence guarantee must be perceived as credible by Indo-Pacific nations in order for Australia's position as security partner of choice in the region to remain firm and prevent the pivot to Beijing for security, as has already occurred in the Solomons and Kiribati in recent years.

The DSR identifies that climate change is now a national security issue and a major destabilising factor in the Pacific and it should be expected that the DSR therefore provides some assessment and recommendations in relation to the Defence structure, posture and preparedness to respond. The DSR highlights that the Pacific is critical to the security of Australia and the essentiality of HADR to Australia's Pacific engagement. It further acknowledges the risk that climate change poses to the region as threat

⁵ Pacific Islands Forum Secretariat, "The Pacific Security Outlook Report: 2022-2023," 2022.

⁶ Amanda Gosling Clarke, "Military Challenges From Climate Change," *Contemporary Issues in Air and Space Power* 1, no. 1 (November 1, 2023): bp36471855, <https://doi.org/10.58930/bp36471855>.

⁷ "Australia-Tuvalu Falepili Union Treaty," Australian Government Department of Foreign Affairs and Trade, accessed April 4, 2024, <https://www.dfat.gov.au/geo/tuvalu/australia-tuvalu-falepili-union-treaty>.

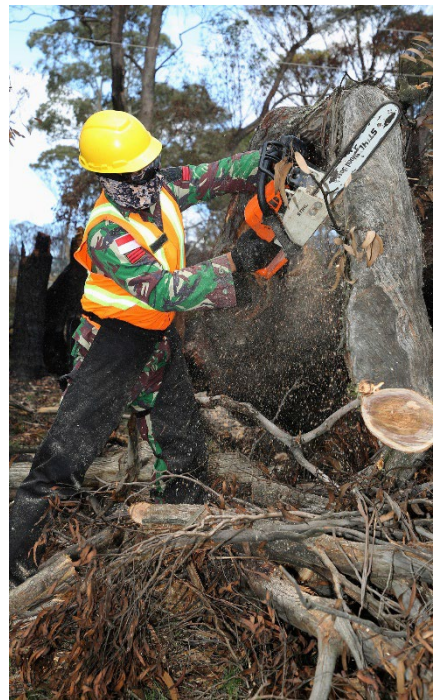
⁸ Euan Graham and Bec Shrimpton, "The Defence and Security Implications of the Australia–Tuvalu Treaty," *The Strategist*, November 23, 2023, <https://www.aspistrategist.org.au/the-defence-and-security-implications-of-the-australia-tuvalu-treaty/>.

multiplier, and ensuing potential for increasing demands for peacekeeping, peace enforcement, and response to intrastate and interstate conflict.⁹ In terms of force design priorities and recommendations however, the DSR is silent on explicit capability requirements to support the expected demands of Pacific HADR and stability operations. At most, the DSR definition of 'focused force'¹⁰ identifies that the capabilities required to address the primary military threat will provide some latent capability to deal with lower-level contingencies and crises.

The DSR is lacking in its stated aim of optimising Defence capability and posture to meet the nation's security challenges to 2033 and beyond when it comes to the national security impacts of climate change in the Indo-Pacific region. The DSR highlights the vital importance of Pacific stability and engagement and significant expected demands related to climate change in the region over the coming decades, but describes only a latent capability to respond. Demands on the ADF as a result of first, or higher order effects of climate change in the Pacific are almost a certainty and Australia's credibility as a security partner and regional leader relies on the ADF being able to credibly respond, yet the DSR does not specifically address these demands in its force design priorities.

Domestic disaster response and recovery support

Consistent with the upwards trend of climate change impacts in the Pacific, domestic climate events are also predicted to continue rising in frequency and intensity, presenting a significant risk to Australians. Since the extreme bushfire season of 2019-2020, which resulted in a significant loss of life and livelihood, Australia's resilience and response to domestic disasters has been the subject of intense debate. Significant weaknesses in emergency management structures, funding arrangements and responsibilities between the state and federal governments have been identified and the role of the ADF in augmenting response and recovery support, when state resources have been overwhelmed, has been a major consideration.¹¹ Clarke highlights the increasing trend in ADF involvement in climate change related operations over the past 25 years and its correlation with Australia's rising mean temperature anomaly.¹² Whilst alternatives to the ADF are being explored, the continuing pace of



⁹ Australian Government - Department of Defence, *National Defence: Defence Strategic Review*, 41–46.

¹⁰ Australian Government - Department of Defence, 54.

¹¹ Mark Binskin, Chair, "Royal Commission into National Natural Disaster Arrangements: Report," Inquiry Report ([Manuka, A.C.T.]: Royal Commission into National Natural Disaster Arrangements, October 28, 2020), Australian Family & Society Abstracts Database; Australian Government - Department of Climate Change, Energy, the Environment and Water, "National Climate Risk Assessment - First Pass Assessment Report," 2024.

¹² Clarke, "Military Challenges From Climate Change."

extreme weather events predicted and current immaturity of alternate capabilities make it likely that the demands on the ADF to contribute to domestic disaster response and recovery support will continue in the coming decades.

The use of ADF personnel to support domestic disaster relief is problematic due to the concurrency pressures on preparedness and capacity for primary security and warfighting tasks.¹³ This has been recognised by Government, with the *Royal Commission into National Natural Disaster Arrangements* and the DSR clearly articulating the risks to the defence of Australia inherent in continuing to use the ADF in this role.¹⁴ A suitable alternative to ADF support has not yet been agreed and implemented and there have been suggestions that the ADF should be postured to play a larger role, rather than be supplanted. In his speech to the National Press Club in 2020, Prime Minister Scott Morrison spoke of consideration for a greater role in domestic disaster relief for the ADF.¹⁵ Glasser has further highlighted the need to adapt the posture, training and capabilities of the ADF to meet the expected demands of disaster relief alongside traditional security roles.¹⁶ Until a clear decision and implementation of an alternative to Defence as a disaster response force is attained, it is likely that Defence will continue to be requested to provide support and concurrency pressures should be accounted for in the Defence force design.

The development of an alternative to the ADF for domestic disaster relief will be challenging to realise in the next decade. The support provided by the ADF to augment the capacity of the states is described by Alexander as being a function of capability and scale. The ADF maintains a range of military and support capabilities not readily available to community or industry, inclusive of skilled personnel trained to operate such capabilities in highly demanding situations. It also provides a readily accessible, prepaid workforce able to provide support to low-skilled support tasks, prepositioned and capable of internal management of planning, movement and logistical functions.¹⁷ Funding is a significant barrier to replicate the capabilities and scale that Defence currently provides, particularly as the responsibility for initial disaster response rests within individual states and territories. Recruiting, training, maintaining and coordinating a national disaster relief workforce, either paid or volunteer, is also a monumental task which will be further hampered if tackled differently by each state. Even if the funding barrier could be overcome, using the acquisition and force generation lead time of major Defence capabilities as an indicator, it could reasonably be expected to take a decade or more to develop a sufficiently equipped and skilled core of capabilities and workforce to provide a realistic alternative to the ADF. Such being the case, it would be reasonable to expect the ADF to plan and posture, via the DSR, to meet at least some level of the increasing needs of domestic disaster response and recovery support until able to transition to an alternative.

The DSR does not include demands for domestic disaster relief in the force design and

¹³ Australian Government - Department of Defence, *National Defence: Defence Strategic Review*, 41.

¹⁴ Mark Binskin, Chair, "Royal Commission into National Natural Disaster Arrangements: Report," 185–202.

¹⁵ Scott Morrison, "Address, National Press Club," PM Transcripts, January 29, 2020, <https://pmtranscripts.pmc.gov.au/release/transcript-42638>.

¹⁶ Robert Daniel Glasser, "The Rapidly Emerging Crisis on Our Doorstep" ([Barton, Australian Capital Territory]: Australian Strategic Policy Institute, 2021).

¹⁷ Stephen Alexander, "Australian Defence Force Refocus of Resources Will Leave a Gap in Response and Recovery," *The Australian Journal of Emergency Management* 38, no. 3 (July 1, 2023): 6.

assigns the responsibility to the Commonwealth to arrange suitable response measures in conjunction with the states and territories, with Defence as a measure of last resort only.¹⁸ Government has only agreed-in-principle to the recommendation, and exploration of alternatives continues. The recent *National Climate Risk Assessment* has identified the concurrency impacts to Defence preparedness as a key risk to progress to second pass assessment and implementation planning. Public submissions have also been collated in support of a discussion paper on *Alternative Commonwealth Capabilities for Crisis Response*.¹⁹ Development and implementation of alternative capacity and capability will take significant time and funding to implement, however, as previously described. There is not currently, nor likely to be in the next decade, a suitable mature alternative to calling out Defence as an adjunct domestic disaster relief force, despite acknowledgement of the impact on Defence preparedness to undertake primary security roles. By disassociating Defence from the problem, the DSR force design fails to recognise that until such time as an alternative is implemented, Defence will continue to be called out, realising the preparedness and concurrency risks highlighted.

ADF operations in the north

Defence activities in northern Australia will be particularly prone to the impacts of climate change over the next 20 years. Thomas describes two major aspects to this impact. Firstly, the increasing frequency and intensity of climate events will affect Defence bases, infrastructure, ports and equipment, including the reliance on civilian infrastructure such as sewerage, power, water. Extremes of heat, humidity, tides and weather have the potential to challenge both personnel and equipment, with the operating performance of fuels and sensors, and the ability of personnel to operate in high temperature environments posing significant challenges.²⁰ Secondly, climate hazards will impact the conduct of military training. Drought, floods, extreme weather and tide events will constrain the viability of training safely and to the extent needed to achieve required preparedness levels. For example, the fire danger associated with live fire activities in dry conditions.²¹ Townsville is an example of a major northern Defence base that also hosts some of Australia's largest joint and multilateral training exercises in the nearby training areas. The coming decades in the Townsville regions are predicted to bring higher temperatures and more frequent hot days above 35 degrees Celsius. The region will also be subject to more intense downpours and cyclones, rising sea levels, more frequent sea level extremes and warmer, more acidic seas.²² This increasingly harsh operating environment is representative of the challenges that must be a key consideration in ADF force design decisions when expanding its posture and operations

¹⁸ Australian Government - Department of Defence, *National Defence: Defence Strategic Review*, 41.

¹⁹ Australian Government - Department of Climate Change, Energy, the Environment and Water, "National Climate Risk Assessment - First Pass Assessment Report," 13–15; Department of Home Affairs Website, "Alternative Commonwealth Capabilities for Crisis Response Discussion Paper," Department of Home Affairs Website, accessed April 6, 2024, <https://www.homeaffairs.gov.au>.

²⁰ Clarke, "Military Challenges From Climate Change."

²¹ Michael Thomas, "Climate Change and Military Forces," ed. Robert Glasser, Cathy Johnstone, and Anastasia Kapetas, *The Geopolitics of Climate and Security in the Indo-Pacific* (Barton, Australian Capital Territory: Australian Strategic Policy Institute, 2022).

²² Mark Ogge, Bill Browne, and Travis Hughes, "HeatWatch: Increasing Extreme Heat in Townsville" (The Australia Institute, March 2019), https://australiainstitute.org.au/wp-content/uploads/2020/12/P692-HeatWatch-Townsville-WEB_0.pdf; Queensland Government: Department of Environment and Science, "Climate Change in the Townsville-Thuringowa Region," 2019, https://www.qld.gov.au/__data/assets/pdf_file/0025/124675/townsville-climate-change-impact-summary.pdf.

in northern Australia.

Previous Defence reviews have highlighted the pressures climate change will levy on the Defence estate, however the DSR does not articulate or assess climate change when assigning priorities for estate and force posture in the north. The DSR places significant emphasis on remediation and hardening of Defence bases in the north of Australia and the strategic criticality of the ability to posture in the north, including robust civil infrastructure. The DSR's land domain force structure design priorities include major redistribution of Army personnel and equipment across northern bases, including an additional 500 personnel and their families to move from Adelaide to Townsville. The need to consider climate risks to estate is well established with the *2016 White Paper* highlighting the need to ensure Defence estate is appropriately planned and postured to meet the implications of climate change beyond 2025.²³ The 2018 senate committee on the *Implications of climate change for Australia's national security* noted the additional stress that climate change places on a range of military support and enabling functions.²⁴ The DSR does note the vulnerability of northern civil infrastructure to the effects of climate change, including road and rail networks and security of fuel supply, but recommends that these be dealt with by other bodies or in future work. Therefore, the DSR as it stands fails to fully identify or address the climate risks associated with the force design priorities in the north of Australia, one of the most climate affected areas of Australia. This suggests that the ADF will be inadequately prepared to deal with these climate risks as they are realised.

Conclusion

When considering a three-point estimate of the strategic risks facing Australia in the next two decades, the worst-case scenario is that major power competition spills over into a conflict scenario that impacts Australia's sovereignty and national interests. The best-case is of course that the Indo-Pacific region is stable, secure and prosperous economically, politically and environmentally and the ADF remains an uncalled upon insurance policy. This paper contends that the most-likely, in fact almost certain scenario, is that the ADF will be operationally tasked in relation to the effects of climate change. The DSR has framed its force design and investment priorities around the highest strategic risk, and there is no argument that the ADF must be capable of deterrence and response to the highest level of threat Australia is likely to face. When addressing the most-likely threat of climate change however, this paper has shown that the force design articulated in the DSR contains serious gaps in its ability to meet the demands expected to be meted on Defence in the coming decades.

Batemen and Bergin's definition of the major elements of climate change risk to national security provides a useful framework against which this paper has examined the extent to which the DSR addresses climate change impacts in the Pacific, domestically and in the execution of Defence activities in the north. The DSR is clear in recognising that climate change will amplify challenges across the region, and emphasises the importance of the collective security and engagement in the Indo-Pacific, yet describes only latent capability to deal with emergent crises and low-level conflicts. The ADF's role in HADR, peacekeeping and stability operations, as a result of climate change, are critical to Australia's reputation and regional leadership, and the credibility of Australia's ability to provide a defence guarantee under formal arrangements such as that with Tuvalu.

²³ Australian Government - Department of Defence, *2016 Defence White Paper*, Parliamentary Paper (Australia. Parliament) ; 2016, No. 59, 2016, 102, <http://www.defence.gov.au/whitepaper/Docs/2016-Defence-White-Paper.pdf>.

²⁴ Senate Foreign Affairs, Defence and Trade References Committee, *Senate Report: Implications of Climate Change for Australia's National Security*, 2018, 26–27.

The DSR dissociates Defence from a routine role in domestic disaster relief and recovery support, citing the concurrency pressures impacting preparedness, readiness and combat effectiveness for the ADF's primary task. It is unrealistic for Defence to expect operational taskings in support of domestic disaster relief to cease until a viable alternative has been implemented, which could conceivably take more than a decade. This will leave Defence realising the identified concurrency risks when Government has no other response alternatives and must act to save the lives of Australians. Lastly, Defence estate and infrastructure has been established on the basis of a stable climate with predictable variability.²⁵ The DSR places an immediate priority on remediation and hardening of Defence bases in the north of Australia and makes significant posture changes in the region. The impact of climate change is likely to have severe ramifications on Defence activities and critical infrastructure in northern Australia in the coming decades. Despite there being an established case for consideration through previous Defence reviews, the DSR does not explicitly address these issues.

The implications of the gaps identified in this paper are manifold. By not designing the force to meet the demands of the most-likely national security threat, climate change, the risks of concurrency pressures impacting preparedness, readiness and combat effectiveness are more likely to be realised. This could have severe follow-on consequences to the ADF's ability to meet the primary military security threat identified in the DSR as well as reputational impacts to Australia's position in the Indo-Pacific, putting further pressure on regional stability. It is heartening to see that there is significant energy being devoted to addressing, or at least further defining, some of these issues through parallel initiatives such as the *National Climate Change Risk Assessment*, *Alternative Commonwealth Capabilities for Crisis Response Discussion Paper* and others. The forthcoming *National Defence Strategy* and biennial net assessment of the DSR provide significant opportunities to recognise the significance of climate change impacts and should seek to refine the ADF force design priorities to ensure Defence is truly postured to meet the demands of the coming decades.

²⁵ Anthony Bergin, "Senate Report on Climate Change and National Security Offers Opportunities for Defence," *The Strategist*, June 4, 2018, <https://www.aspistrategist.org.au/senate-report-on-climate-change-and-national-security-offers-opportunities-for-defence/>.

References

- Alexander, Stephen. "Australian Defence Force Refocus of Resources Will Leave a Gap in Response and Recovery." *The Australian Journal of Emergency Management* 38, no. 3 (July 1, 2023): 6.
- Australian Government - Department of Climate Change, Energy, the Environment and Water. "National Climate Risk Assessment - First Pass Assessment Report," 2024.
- Australian Government - Department of Defence. *2016 Defence White Paper*. Parliamentary Paper (Australia. Parliament) ; 2016, No. 59, 2016. <http://www.defence.gov.au/whitepaper/Docs/2016-Defence-White-Paper.pdf>.
- . *National Defence: Defence Strategic Review*, 2023.
- Australian Government: Department of Defence. "Incoming Government Brief (Declassified)," September 2022. https://www.defence.gov.au/sites/default/files/2022-09/514_2122_documents.pdf.
- Australian Government Department of Foreign Affairs and Trade. "Australia-Tuvalu Falepili Union Treaty." Accessed April 4, 2024. <https://www.dfat.gov.au/geo/tuvalu/australia-tuvalu-falepili-union-treaty>.
- Bateman, S., and A. Bergin. *Naval, National Security and Defence Issues from Climate Change*. Research Handbook on Climate Change, Oceans and Coasts. Edward Elgar Publishing Ltd., 2020. <https://doi.org/10.4337/9781788112239.00030>.
- Bergin, Anthony. "Senate Report on Climate Change and National Security Offers Opportunities for Defence." *The Strategist*, June 4, 2018. <https://www.aspistrategist.org.au/senate-report-on-climate-change-and-national-security-offers-opportunities-for-defence/>.
- Clarke, Amanda Gosling. "Military Challenges From Climate Change." *Contemporary Issues in Air and Space Power* 1, no. 1 (November 1, 2023): bp36471855. <https://doi.org/10.58930/bp36471855>.
- Department of Home Affairs Website. "Alternative Commonwealth Capabilities for Crisis Response Discussion Paper." Department of Home Affairs Website. Accessed April 6, 2024. <https://www.homeaffairs.gov.au>.
- Glasser, Robert Daniel. "The Rapidly Emerging Crisis on Our Doorstep." [Barton, Australian Capital Territory]: Australian Strategic Policy Institute, 2021.
- Graham, Euan, and Bec Shrimpton. "The Defence and Security Implications of the Australia–Tuvalu Treaty." *The Strategist*, November 23, 2023. <https://www.aspistrategist.org.au/the-defence-and-security-implications-of-the-australia-tuvalu-treaty/>.
- Mark Binskin, Chair. "Royal Commission into National Natural Disaster Arrangements: Report." Inquiry Report. [Manuka, A.C.T.]: Royal Commission into National Natural Disaster Arrangements, October 28, 2020. Australian Family & Society Abstracts Database.
- Morrison, Scott. "Address, National Press Club." PM Transcripts, January 29, 2020. <https://pmtranscripts.pmc.gov.au/release/transcript-42638>.
- Ogge, Mark, Bill Browne, and Travis Hughes. "HeatWatch: Increasing Extreme Heat in Townsville." The Australia Institute, March 2019. https://australiainstitute.org.au/wp-content/uploads/2020/12/P692-HeatWatch-Townsville-WEB_0.pdf.
- Pacific Islands Forum Secretariat. "The Pacific Security Outlook Report: 2022-2023," 2022.

Queensland Government: Department of Environment and Science. "Climate Change in the Townsville-Thuringowa Region," 2019.
https://www.qld.gov.au/__data/assets/pdf_file/0025/124675/townsville-climate-change-impact-summary.pdf.

Senate Foreign Affairs, Defence and Trade References Committee. *Senate Report: Implications of Climate Change for Australia's National Security*, 2018.

Thomas, Michael. "Climate Change and Military Forces." Edited by Robert Glasser, Cathy Johnstone, and Anastasia Kapetas. *The Geopolitics of Climate and Security in the Indo-Pacific*. Barton, Australian Capital Territory: Australian Strategic Policy Institute, 2022.

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Case Study 2

Set against a backdrop of increasing major power competition, particularly with China's assertive stance in the Indo-Pacific region, rapid geopolitical shifts and emerging security challenges will likely be the defining features of Australia's Defence operating environment over the next two decades. The 2023 Defence Strategic Review (DSR) addresses this as a holistic consideration of Australia's Defence broad force design, ensuring it has the right capabilities and posture for these strategic challenges¹. The end-state for this review was to identify six priority areas for immediate action (*Figure 1*)². The DSR, however, is jeopardised by its poor implementation tempo and orchestration, uncertain political and financial support, and failure to provide the versatile and flexible force structure required for evolving, non-traditional, regional threats and diplomatic demands of the Indo-Pacific. These shortfalls critically undermine the effectiveness and relevance of the DSR and, therefore, its ability to provide the broad force design needed for the coming decades.

Australia's Defence Operating Environment

Over the next two decades, Australia's threat operating environment is anticipated to be shaped by several key factors. These include the rise of China as a strategic competitor, technological advancements in warfare, and evolving geopolitical dynamics in the Indo-Pacific. The expansion of China's military capabilities and assertive posture in and beyond the South China Sea have been identified as primary concerns, necessitating a recalibration of Australia's Defence strategy and capabilities³. The focus on technological advancements, particularly in cyber warfare, artificial intelligence, and quantum computing, underscores the need for Australia to enhance its technological edge and cyber resilience⁴. Establishing AUKUS and expanding this partnership reflects Australia's strategic pivot towards deepening alliances with like-minded countries to address these challenges⁵.

¹ The Australian Government. Defence Strategic Review: Terms of Reference for the Independent Leads of the Review (2022), 1

² Anthony Albanese. "Release of the Defence Strategic Review." (news release, 24/04/2023, 2023)

³ The Australian Government. Defence Strategic Review (2023), 23

⁴ Jennifer Jackett. Laying the Foundations for Aukus: Strengthening Australia's High-Tech Ecosystem in Support of Advanced Capabilities. (University of Sydney, 2022), 25-28

⁵ Peter Lee and Alice Nason. 365 Days of Aukus: Progress, Challenges and Prospects. (University of Sydney, 2022).

Figure 1: The DSR's identified order of six priority areas requiring immediate action²:

1. **Acquisition of nuclear-powered submarines** through AUKUS to improve our deterrence capabilities;
2. Developing the Australian Defence Force's (ADF) **ability to precisely strike targets at longer-range** and manufacture munitions in Australia;
3. Improving the **ADF's ability to operate from Australia's northern bases**;
4. Initiatives to improve the **growth and retention of a highly skilled Defence workforce**;
5. Lifting our capacity to rapidly translate disruptive new technologies into ADF capability, in **close partnership with Australian industry**; and
6. **Deepening of our diplomatic and defence partnerships** with key partners in the Indo-Pacific.

It is now well established that Australia's strategic environment no longer affords the luxury of extended warning times. The rapid pace of geopolitical developments, especially China's military modernisation and regional assertiveness, necessitates swiftly adapting Australia's defence capabilities⁶. China has already begun to project hard power into the South China Sea, East China Sea, and around Taiwan to assert its interests in the Indo-Pacific. With President Xi Jinping's modernisation goals of 'informationisation', 'professionalisation' and 'intelligentisation' stratified out to 2050⁷, these hard power means will likely continue to advance at an accelerating rate.

Tempo of Implementation and Strategic Orchestration

The concept of "tempo" is crucial in defence readiness. As described by Robert Leonhard in the context of a chess game, "*tempo consists of the player's pace of moves, such that the opponent, who may have a good plan, has no time to execute it*". In this way, tempo will force the opponent to consistently 'react' defensively while the player advances their plan⁸. In defence planning, "tempo" refers to the speed and efficiency with which military capabilities can be developed, acquired, and operationalised. A rapid tempo is crucial for maintaining strategic relevance, especially in a fast-evolving security environment. The DSR's effectiveness is contingent not only on the strategies it outlines but also on the relative speed and efficiency of its implementation compared to that of competing nations.

Australian acquisition of the DSR's key capabilities must be viewed in context to the aforementioned rate of China's military evolution. Comparison can be drawn from the procurement and implementation plans for the nuclear-powered submarines and an anti-access/area-denial (A2/AD) shield. The transition to nuclear-powered submarines under the AUKUS agreement involves acquiring at least three Virginia-class submarines in the

⁶ Greg Austin, China's Military Buildup: The Biggest since 1945? (2024).

⁷ Meia Nouwens, China's Military Modernisation: Will the People's Liberation Army Complete Its Reforms?. (In Strategic Policy. International Institute for Strategic Studies, 2022), 53-64

⁸ Robert R Leonhard, The Art of Maneuver: Maneuver-Warfare Theory and Airland Battle (Novato, CA: Presidio Press, 1991), 16

early 2030s and building a new design in cooperation with the United Kingdom and the United States for delivery in the early 2040s. However, concerns about a capability gap during this transition period have been raised⁹. Without domestic large-scale nuclear infrastructure, including weapons or power generation, considerable planning and consideration are still required for managing Virginia-class nuclear-powered submarines (i.e. nuclear waste disposal¹⁰) and the eventual development of the 'AUKUS-class'. On top of existing international post-COVID economic supply chain and inflation demands, this significant friction has already seen delays to this forecast acquisition¹¹, and risks further extension of the Collins-class capability gap.

While nuclear-powered submarines will allow Australia to deter throughout the region, the A2/AD shield provides the deterrent back home. Through 'deterrence by denial' the DSR aims to stop an adversary by denying any attempt to project power against Australia through its northern approaches¹². Australia's current surveillance capabilities lack the fidelity required to support targeted long-range fires¹³, and a strike capability (identified as necessary in both the 2009 and 2016 white papers) is yet to arrive. Subsequently, Australia's A2/AD shield is effectively being established from scratch¹⁴. 2022 saw many announcements regarding the procurement of A2/AD strike capabilities and the sovereign development of guided weapons and explosive ordnance with Raytheon Australia and Lockheed Martin Australia¹⁵, scheduled to start production by 2025. In contrast to the nuclear-powered submarines, Australia looks likely to have this capability long before threat forces have the capacity or reason to test it.

While the orchestration of the AUKUS acquisition sequence may be driven through procurement timelines, it is essential to acknowledge what it means in the temporal context of peer actions in Australia's region. While the Chinese military build-up and modernisation are impressive, the PLA remains fixated on its near region. Most Chinese ship-building is focussed on corvettes and patrol-class, and missile development and build-up prioritising that of intermediate-range¹⁶. Through rapid integration of the A2/AD shield, contrasted with the delayed acquisition of nuclear submarines, Australia is placing its immediate prioritisation on a defence capability and posture that is not soon to be challenged. This capability is in exchange for the inability to sufficiently force-project strategic assets into the regions currently or soon may be under competition of influence. Furthermore, based on these timelines and the intense focus of China on military modernisation, it is uncertain if the AUKUS submarines will be the dominant military hardware in this region when they arrive¹⁷. In this way, the current implementation of DSRs critical strategic capabilities is sacrificing an indefinite amount of time, in exchange for a dubious capability advantage.

It is also imperative to reflect on this order of capability development and what it implies

⁹ David Feeney, *The Submarine Capability Gap*. (2020).

¹⁰ Four Corners, "Can Australia handle its new fleet of nuclear submarines?"2023.

¹¹ WSJ Opinion, "Nuclear Submarines, Aukus and Rebalancing the Indo-Pacific Security Environment."2024, on The Wall Street Journal

¹² The Australian Government, *Defence Strategic Review*, (2023) 49

¹³ Daniel Molesworth, *Australian Army's Long-Range Strike Capability Could Be Firing Blind* (Australian Strategic Policy Institute, 2022).

¹⁴ Andrew Carr, *Australia's Archipelagic Deterrence*. (Survival 65, no. 4, 2023/07/04, 2023): 82-83

¹⁵ Peter Dutton, *Australia Takes Next Step to Delivering Guided Weapons and Explosive Ordnance Enterprise*, (2022).

¹⁶ Nouwens, *China's Military Modernisation*, 62

¹⁷ The Wall Street Journal, *U.S. Vs. China: Can China Catch Up With U.S. Nuclear Submarine Tech?* (2023)

for Australia's influence in the Indo-Pacific region. Australia's immediate focus on near-region A2/AD appears to underscore a Defence philosophy, signalling a myopic approach. One that places haste on immediate deterrence but fails to prioritise a timeline focussed upon regional influence or security. Indo-Pacific partners may begin to view Australia as a country that prioritises its ability to deliver explosive ordinance onto their doorstep rather than send other strategic assets capable of supporting them against their adversaries. This narrative may further undermine Australian influence in the Indo-Pacific.

In summary, in an environment of accelerated geopolitical competition in Australia's near region, where the argument can be made, Australia failed to observe its own stipulated 10-year warning time. The DSR fails to prioritise the rapid acquisition of strategic capabilities which can force-project quick enough to deter near-term competition. Combined with the rapid focus on an A2/AD shield, this prioritisation fails to appreciate the current threat force capability or intent and undermines Australia's legitimacy as a nation aiming to support its peers to maintain independence.

Financial and Political Risks

Implementing the DSR's proposals requires stable and substantial financial investment, yet political uncertainties and the prospect of shifting priorities pose significant risks. Financially, the DSR comes off a reduced funding base, a repercussion of what could be considered a premature post-Cold War 'peace dividend'. Historical budget allocations to Defence in 1987 stood at approximately 9% of the total budget and about 2.5% of GDP, compared to significantly lower current proportions¹⁸. Restoring funding to these levels would require substantial increases in the defence budget, which may not be politically feasible given the myriad other demands on government spending. Over the last 25 years, extensive underfunding has had detrimental impacts on Australia's defence capability and infrastructure, leading to a critical under-preparedness in the Australian Defence Force that the DSR seeks to address. The recommendation to significantly increase the defence budget will face harsh scrutiny and possible opposition in the Expenditure Review Committee meetings, where any proposals for such substantial increments will likely be resisted due to the broader fiscal implications.

Politically, the DSR is at risk due to the gap between the politically endorsed strategic priorities and the actual capability proposals received from the Defence Department. In the past, scenarios for the ADF's force-structuring were only approved by the Chiefs of Staff Committee without explicit political endorsement¹⁹. For the DSR's goals to be effectively met, there must be alignment between government strategic intent and the operational scenarios for force design. The DSR's intent for the ADF to focus on a clear and present threat rather than a range of potential adversaries suggests a shift toward force design scenarios that align with the increasing tension with China. This shift necessitates a degree of political consensus and support that may be challenging to sustain over the long term, especially in a democratic nation where the short tenure of political parties risks their prioritisation towards policies that see more immediate benefit for their voting constituents.

The other political friction about to be encountered is the soon-to-be-released 2024 National Defence Strategy. While it's said this strategy will broadly reflect the DSR, this document will outline the Labour Government's capability plan to align the ADF with the

¹⁸ Kim Beazley, *Affording Australia's Defence* (Australian Strategic Policy Institute, 2023)

¹⁹ Stephan Fruehling, *The Defence Strategic Review: A Revolution in Australian Defence Planning?* (Australian Strategic Policy Institute, 2023)

DSR²⁰. In this way, it risks becoming a politicised instrument that could either reinforce the DSR's recommendations through a broader, more coordinated approach to defence planning or overshadow and divert from them, depending on political influences at its release²¹. As the National Defence Strategy is set to be a living document, this further risks a continuous 'watering down' of the DSR's recommendations to align with financial and political pressures, meaning the force design proposed may never come to fruition.

These risks underscore the complex challenge facing the implementation of the DSR. While it sets ambitious targets for reforming Australia's defence posture and capabilities, the financial and political landscapes present formidable hurdles that could significantly impact its successful execution and, by extension, its effectiveness.

Misalignment with Indo-Pacific Regional Strategy

Australia's strategic recalibration must account for the complex dynamics of the Indo-Pacific region. Australia must maintain a balanced approach that navigates the challenges posed by China's strategic ambitions while fostering regional stability and cooperation. This balance involves a nuanced foreign policy that leverages alliances and partnerships, advocates for a rules-based international order, and promotes engagement with China in areas of mutual interest.



While the DSR advocates the transition from a Balanced to a Focused force, inclined towards acquiring high-end offensive capabilities and could be seen as reactive to perceived threats, an alternate Defence Strategy lies within the philosophy of defensive realism. This philosophy proposes that a state can achieve adequate security without threatening others, thereby reducing the chances of escalation and conflict. Sam Roggeveen's "Echidna Strategy" articulates this vision for Australia's Defence, advocating for a formidable but non-provocative defence posture, one that emphasises making Australia a 'hard target' through investments in asymmetric capabilities while enhancing its ability to contribute to regional stability through non-offensive means²². Not only could this strategy be more sustainable and less likely to contribute to regional arms races, but this approach resonates with Australia's strategic context, where the primary aim is to dissuade potential aggressors by showcasing robust defensive capabilities rather than seeking to match the offensive power of regional powers like China. By investing in and enhancing capabilities tailored to Australia's unique strategic circumstances, the "Echidna Strategy" proposes a cost-effective way to maintain sovereignty, security, and regional stability, all of which are crucial for Australia's long-term defence posture in a rapidly evolving Indo-Pacific environment.

The need to oppose non-traditional threats is another argument favouring a Balanced

²⁰ Richard Marles, Speech to the Sydney Institute (2024)

²¹ Courtney Stewart and Gregory MacCallion, National Defence Strategy Will Need to Clarify Australia's Approach to Deterrence (Australian Strategic Policy Institute, 2023).

²² Sam Roggeveen, *The Echidna Strategy* (La Trobe, 2023), 161-197

force. Susan Harris Rimmer argues that alongside traditional security, non-traditional threats, particularly the impact of climate change as a 'threat multiplier', need to be integrated into strategic considerations²³. This argument suggests that Australia should focus on dual-use military capabilities for climate emergencies, reject nuclear options incompatible with international law and a rules-based order, and increase investment in conflict prevention, climate response, development assistance, and preventive diplomacy. Integrating dual-use capabilities would allow the ADF to maintain a robust deterrent posture while providing humanitarian assistance, disaster relief, and support for regional stability. This Defence posture would promote a favourable image of Australia that underscores responsible and engaged regional leadership. The balanced application of hard and soft power requires a versatile and responsive military (i.e. a Balanced force) capable of addressing a spectrum of challenges, from high-end military deterrence to securing peace and stability within the region.

The DSR's focus has also been criticised for its singular emphasis on defence capabilities, potentially at the expense of other dimensions of national security. Strating and Wallis argue that a comprehensive National Security Strategy that considers the full spectrum of security challenges, including cyber threats, transnational crime, and climate change, has not yet been adequately developed²⁴. The DSR, therefore, risks establishing a path-dependent trajectory that predominantly views security through an exclusively defence lens, which may divert attention and resources away from other crucial areas of national or regional security that require investment and development. Rather than focusing on the DSR's more forthright military capabilities, Geoff Raby recommends leveraging diplomatic channels and fostering economic ties to build mutual trust and cooperation within the Indo-Pacific²⁵. This strategy emphasises a more balanced approach, prioritising regional stability and prosperity through partnership and dialogue rather than predominantly military posturing. A whole-of-government approach is necessitated to deal with the strategic circumstances that are not solely the purview of Defence but require a national unified strategic response.

Australia's security is interlinked with that of its neighbours in the South Pacific and Southeast Asia. Rory Medcalf describes the concept of Indo-Pacific middle-players (i.e. not China or the United States) focused on inclusive democracy in a region of shared space, aimed to support regional stability and avail the need to take sides in the growing tension between the two hegemons²⁶. While this concept was initially formed as an insulator against the United States' unreliability under Trump, it has been undermined by the Biden administration's targeted re-engagement in the region. Key to this, the AUKUS agreement has shaped Australia and the DSR towards firming an alliance that is increasingly interested in building its own front against China. This shift has led other middle-player nations in the Indo-Pacific to increase their engagement with China, which, rather than isolating, has sought to build their domestic resilience. Unlike the United States, Australia has the unique opportunity within the Indo-Pacific to leverage its decades of diplomatic support to fellow middle-players to support their independence, prosperity and continuity of a rules-based order in the region. However, this will be contingent on having a Defence force design and diplomatic capability to project

²³ Susan Harris Rimmer, *How to Defend Australians: A Heterodox Approach*, (Centre of Gravity Series, no. 51, 2020), 13-22

²⁴ Bec Strating and Joanne Wallis, *Australia's Future Security: Where the Defence Strategic Review Falls Short* (Lowy Institute, 2023)

²⁵ Geoff Raby, *China's Grand Strategy and Australia's Future in the New Global Order* (Carlton, Victoria: Melbourne University Press Digital, 2020), 145-153

²⁶ Rory Medcalf, *Contest for the Indo-Pacific: Why China Won't Map the Future* (Vol. 2: La Trobe University Press, 2022), 22-25

influence and support to the region, which may be hampered by the DSR prioritisation of a Focused force and increased presence of the United States military on Australian shores.

In summary, the DSR's emphasis towards a Focused force, centred on the defence of Australia rather than support to Australia's near region, risks creating the perception that Australia is no longer interested in supporting partnerships in this region. It risks isolating Australia from its peers and China (as a trading partner) through the perception of starting an 'arms race' in the region. It fails to provide a balanced, broad force design capable of responding to non-traditional threats. Furthermore, through being established before a coherent National Security Strategy, the DSR risks shaping government responses to regional tensions led by Defence rather than a balanced diplomatic reaction. These risks, combined with the DSR prioritising deeper integration with the United States, undermine Australia's influence and capability to shape and support the regional security necessary to contain China's influence and maintain a rules-based order.

Summary

Australia's 2023 DSR contends with an increasingly competitive and uncertain geopolitical landscape, heavily influenced by the assertive rise of China and the technological acceleration of warfare capabilities. While the DSR aims to recalibrate Australia's defence force to address these emerging challenges, its execution risks being marred by a slow tempo of implementation, budgetary constraints, and potential misalignments with broader strategic goals. The agile development and deployment of advanced military technologies, critical for maintaining regional influence and deterrence, may not keep pace with rapid advancements and strategic manoeuvres by potential adversaries, particularly China.

Moreover, the DSR's focus on specific capability acquisitions, such as the AUKUS-led nuclear-powered submarines, underscores concerns about a capability gap and questions the strategic prioritisation amid evolving threats. The possibility that Australia may prioritise near-region deterrence capabilities over immediate force projection assets could result in a defence posture reactive to rather than shaping regional dynamics. The strategic vision articulated in the DSR, while robust in its objectives, requires a more nuanced execution plan that enhances military readiness and ensures the alignment of defence initiatives with diplomatic efforts to promote stability and security in the Indo-Pacific. Balancing these complex strategic considerations will be critical to forging a resilient Defence broad force design capable of navigating the multifaceted security environment projected for the coming decades.

References

Four Corners, "Can Australia handle its new fleet of nuclear submarines?" 2023, on ABC. <https://www.youtube.com/watch?v=lgqs1qDbnK4>.

Albanese, Anthony. "Release of the Defence Strategic Review." news release, 24/04/2023, 2023, <https://www.minister.defence.gov.au/media-releases/2023-04-24/release-defence-strategic-review>.

Austin, Greg. *China's Military Buildup: The Biggest since 1945?* (2024). <https://www.internationalaffairs.org.au/australianoutlook/chinas-military-buildup-the-biggest-since-1945/>.

Beazley, Kim. *Affording Australia's Defence*. Australian Strategic Policy Institute (2023). <https://www.aspistrategist.org.au/affording-australias-defence/>.

Carr, Andrew. "Australia's Archipelagic Deterrence." *Survival* 65, no. 4 (2023/07/04 2023): 79-100. <https://doi.org/10.1080/00396338.2023.2239058>.
<https://doi.org/10.1080/00396338.2023.2239058>.

Dutton, Peter. *Australia Takes Next Step to Delivering Guided Weapons and Explosive Ordnance Enterprise*, 2022.

Feeney, David. *The Submarine Capability Gap*. (2020). <https://www.lowyinstitute.org/the-interpreter/submarine-capability-gap>.

Fruehling, Stephan. *The Defence Strategic Review: A Revolution in Australian Defence Planning?* Australian Strategic Policy Institute (2023). <https://www.aspistrategist.org.au/the-defence-strategic-review-a-revolution-in-australian-defence-planning/>.

The Australian Government. *Defence Strategic Review: Terms of Reference for the Independent Leads of the Review*, 2022.

———. *National Defence: Defence Strategic Review*, 2023.

Jackett, Jennifer. *Laying the Foundations for Aukus: Strengthening Australia's High-Tech Ecosystem in Support of Advanced Capabilities*. University of Sydney (2022). <https://cdn.sanity.io/files/ooh1fq7e/production/c8e54e01eb241e8c1fa1ae574cd2a137509d656d.pdf/Laying-the-foundations-for-AUKUS-Strengthening-Australias-high-tech-ecosystem-in-support-of-advanced-capabilities.pdf>.

U.S. Vs. China, "Can China Catch Up With U.S. Nuclear Submarine Tech?" 2023, on The Wall Street Journal. <https://www.youtube.com/watch?v=IIWeJHmh0xY>.

Wsj Opinion, "Nuclear Submarines, Aukus and Rebalancing the Indo-Pacific Security Environment." 2024, on The Wall Street Journal. <https://www.youtube.com/watch?v=iGrW66fPMjk>.

Lee, Peter, and Alice Nason. *365 Days of Aukus: Progress, Challenges and Prospects*. University of Sydney (2022). <https://www.ussc.edu.au/365-days-of-aukus-progress-challenges-and-prospects>.

Leonhard, Robert R. *The Art of Maneuver : Maneuver-Warfare Theory and Airland Battle*. Novato, CA: Presidio Press, 1991.

Marles, Richard. *Speech to the Sydney Institute*, 2024.

Medcalf, Rory. *Contest for the Indo-Pacific: Why China Won't Map the Future*. Vol. 2: La Trobe University Press, 2022.

Molesworth, Daniel. *Australian Army's Long-Range Strike Capability Could Be Firing Blind*. Australian Strategic Policy Institute (2022).

<https://www.aspistrategist.org.au/australian-armys-long-range-strike-capability-could-be-firing-blind/#:~:text=Australian%20Army's%20long%20range%20strike,be%20firing%20blind%20%7C%20The%20Strategist&text=The%20Australian%20government%20has%20committed,System%2C%20better%20known%20as%20HIMARS>.

Nouwens, Meia. "China's Military Modernisation: Will the People's Liberation Army Complete Its Reforms?". In *Strategic Policy*, 53-64. International Institute for Strategic Studies, 2022.

Raby, Geoff. *China's Grand Strategy and Australia's Future in the New Global Order*. Carlton, Victoria: Melbourne University Press Digital, 2020. Book.

<https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=nlebk&AN=2658558&site=eds-live&custid=s3330841>.

Rimmer, Susan Harris. "How to Defend Australians: A Heterodox Approach." *Centre of Gravity Series*, no. 51 (2020): 13-22.

https://capweb01.cap.anu.edu.au/sites/default/files/publications/attachments/2020-03/cog_51_web.pdf.

Roggeveen, Sam. *The Echidna Strategy*. La Trobe, 2023.

Stewart, Courtney, and Gregory MacCallion. *National Defence Strategy Will Need to Clarify Australia's Approach to Deterrence*. Australian Strategic Policy Institute (2023).

<https://www.aspistrategist.org.au/national-defence-strategy-will-need-to-clarify-australias-approach-to-deterrence/>.

Strating, Bec, and Joanne Wallis. *Australia's Future Security: Where the Defence Strategic Review Falls Short*. Lowy Institute (2023). <https://www.lowyinstitute.org/the-interpreter/australia-s-future-security-where-defence-strategic-review-falls-short>.

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Case Study 3

This paper will argue that the Force Design outlined in the Defence Strategic Review (DSR) does not meet the demands of the next two decades, a period marked with significant and unpredictable strategic challenges.

The first section argues that the force design in the DSR is too narrowly focussed on denial, the planning carries significant risk due to the reliance on assumptions about the PRC, allies, and partners that history has shown these assumptions are often inaccurate. A broader force design is necessary to mitigate risks associated with these assumptions, emphasising that while a focused force provides clarity and direction, it also limits the military's ability to respond to unforeseen challenges. Australia needs a broad force structure to address a wide range of strategic outcomes and contingencies.

The second argument identifies that the A2AD force design is missing a survivable long-range strike capability until the SSNs capability in 2040. It examines the long-range strike capabilities proposed across the land, air, and sea domains, showing that the force design lacks credible long-range strike in a contested environment due to the survivability and limited ranges from the platforms and missiles being acquired. The argument recommends acquiring the B21 bomber, which could address a survivable long-range strike requirement by 2030, ten years sooner than the SSNs.

The third argument highlights the narrow force design focussing on A2AD in the land domain, arguing that this approach leaves Australia ill-prepared for other contingencies such as an engagement with PRC amphibious forces. It assesses the terrain and infrastructure within the archipelago to the north and provides a detailed comparison of force structures highlighting a capability mismatch between the two forces. It recommends Australia acquire the originally planned 450 IFVs to address the shortcoming.

The DSR terms of reference outlined that the authors were to “ensure that Defence has the right capabilities that are postured to meet the growing strategic challenges that Australia will face in the world in the coming years.”¹ These arguments clearly show that the DSR is based on risky assumptions, delivering a force design that lacks ability to address contingencies, that the key focus of A2AD lacks survivable long range strike and that the current land domain options and contingencies would be ineffective against the PRC.

DSR Force Structure is too narrowly focused on Denial

The DSR force structure has a narrow focus on denial. If assumptions about PRC, our allies' and partners actions are incorrect, then there are too few alternative options for government.

Assessments over the last 20 years have continually misread the PRC, its growth, its economics, its ambition and significantly its strategic actions. President Xi has indicated that re-unification with Taiwan may come to conflict, in his statement of “taking all

¹ “Defence Strategic Review Terms of Reference for the Independent Leads of the Review.” <https://www.pm.gov.au/media/defence-strategic-review>

necessary measures”² which remains a policy of the Ministry of National Defence today.³ How re-unification, and a conflict would be achieved is not well understood due to the differing cultures, values, and approach to competition.⁴ Assumptions for how the PRC would conduct a major conflict must cater for an extremely broad set of questions:

- What would the conflict between the US and PRC look like and how would it evolve?
- What would be the military and strategic goals, and how would the economic and business factors impact a conflict?
- What is the US Plan?
- How would all this impact Australia and any military activities we would be required to do?⁵
- How will Space and Cyber impact the operational and strategic level?

The breadth and complexity of assumptions around PRC actions carry significant risk of incorrect assumptions, therefore a broad force design is required to mitigate the risk of incorrect assumptions.

The DSR moves Australia from a balanced force to a focussed force⁶, with limited resources focusing the force on specific objectives, is prudent. However, the force is focussed on assumptions of potential PRC actions where the west has a poor track record of getting this right. Effective force design balances the tension between focussing on a specific strategy and retaining agility and flexibility of the force. A focussed force aligns the force with a clear objective, and it is an efficient use of resources providing more combat power at a specific point/objective.⁷ The downside being most forces are aligned to a single objective limiting the options not aligned to that objective. Flexible and agile force design creates options and reduces the risk as situations evolve; it brings less force to bear pre-assessed objectives, however it has the benefit of bringing more force on unexpected or unplanned objectives.⁸ Decision makers should be reminded that the Maginot Line in World War 2 was based on incorrect assumptions which lead to French capitulation in just over six weeks.⁹ Ultimately force design cannot eliminate all uncertainties, and a focussed force provides clear unity and direction to the force, yet, additional agile and flexible force capabilities provide a broad agile and flexible force design, providing decision makers with more denial options.

The DSR focusses the force on a narrow strategy of denial, specifically A2AD, ¹⁰ it offers

² Tian, Yew Lun. “China Will Never Renounce Right to Use Force over Taiwan.” Reuters, October 16, 2022. China. <https://www.reuters.com/world/china/xi-china-will-never-renounce-right-use-force-over-taiwan-2022-10-16/>

³ “Defense Policy - Ministry of National Defense.” <http://eng.mod.gov.cn/xb/DefensePolicy/index.html>

⁴ Mitter, Rana, and Elsbeth Johnson. “What the West Gets Wrong About China.” Harvard Business Review, May 1, 2021. <https://hbr.org/2021/05/what-the-west-gets-wrong-about-china>

⁵ Babbage, Ross. The next Major War: Can the US and Its Allies Win against China? Amherst, New York: Cambria Press, 2023.

⁶ “National Defence, Defence Strategic Review,” Page 53

⁷ “The Importance Of Strategically Focused Force Design | Future Forge.” Accessed April 7, 2024. <https://theforge.defence.gov.au/article/importance-strategically-focused-force-design>.

⁸ Macgregor, Douglas. “Thoughts on Force Design in an Era of Shrinking Defence Budgets.” Joint Force Quarterly, no. 63 (Quarter 2011).

⁹ “Battle of France | History, Summary, Maps, & Combatants | Britannica,” March 9, 2024. <https://www.britannica.com/event/Battle-of-France-World-War-II>

¹⁰ “National Defence, Defence Strategic Review,” Para 7.1

few options if this approach is unsuccessful or is not able to be implemented. A2AD relies on exquisite and expensive capabilities; a single strike containing 4 x F-35 (\$400m) is 6% of Australia's fighter force firing 10% (\$24M)¹¹ of the long-range missiles. A task group containing 2 x Hobart Class Destroyers (\$4 Billion)¹² is 66% of the capability and once fired would need weeks to re-arm and re-position. Due to the size of the PRC military, there is risk that their forces could overwhelm the missile stockpiles, delivery platforms or timelines for Australia to achieve effective A2AD in the northern archipelago. Similar to Russia's reported firing of 2,154 missiles¹³ in the first two months of the Ukraine war, draining their stockpiles and requiring conventional military forces to conduct the bulk of the fighting. The DSR does not provide a broad force structure that accounts for a failure, or defeat of our A2AD forces or for the PRC to conduct actions that mitigate or negate A2AD within the northern approaches.

Long-range strike before 2040

The DSR force structure is too narrow in long-range strike capability until SSN capability arrives in 2040. The DSR states long-range strike, undersea warfare, and surface to air missiles as enablers for A2AD.¹⁴ Australia has a potent undersea warfare capability in the Collins class submarines and ANZAC frigates, surface to air missiles are being acquired with the short-range surface to air missiles in the form of NASAMs entering service, and the AIR6502 project to introduce medium and long-range air defence over the coming years.¹⁵ Australia does not currently field a long-range strike capability to implement effective long-range strike. This paper will assess long-range strike using Marcus Hellyer and Andrew Nicholls definition:

*"Operational or theatre-level effects, for example against an adversary's supply lines, logistics hubs, forward operating bases, air bases, deployed air defence networks and command and control systems in Australia's nearer region and approaches. That is, degrading an adversary's ability to conduct operations that directly threaten Australia, our friends, and neighbours in the region and our sea lanes."*¹⁶

Air domain long-range strike missiles are on order such in the form of the JASSM-ER, coupled with the F/A-18F Super Hornets and F-35 Lightnings which will provide an unrefuelled strike radius of 2,000 kilometres. The AGM 158C Long Range Anti-Ship Missile (LRASM) coupled with the F/A-18F Super Hornets, F-35 Lightnings and P-8A Poseidon, with the P-8A will provide a strike radius of 3,000 kilometres.¹⁷ However, the

¹¹ "US Approves JASSM ER Sale to Australia - Australian Defence Magazine." Accessed April 5, 2024. <https://www.australiandefence.com.au/defence/joint/us-approves-jassm-er-sale-to-australia>

¹² Gloury, Darren. "Should Australia's Navy Have More Hobart-Class Air Warfare Destroyers?" The Strategist, September 16, 2021. <https://www.aspistrategist.org.au/should-australias-navy-have-more-hobart-class-air-warfare-destroyers/>

¹³ Beardsworth, James. "Explainer: Is Russia Running Low on Missiles?" The Moscow Times, May 17, 2022. <https://www.themoscowtimes.com/2022/05/17/explainer-is-russia-running-low-on-missiles-a77704>

¹⁴ "National Defence, Defence Strategic Review," Page 49

¹⁵ Department of Defence. "Medium Range Ground-Based Air Defence | Defence." Website. Accessed April 3, 2024. <https://www.defence.gov.au/defence-activities/projects/medium-range-ground-based-air-defence>

¹⁶ Marcus Hellyer, and Andrew Nicholls. "Impactful Projection': Long-Range Strike Options for Australia." *ASPI*, December 2022. Page 11 <https://www.aspi.org.au/report/impactful-projection-long-range-strike-options-australia>.

¹⁷ Perrett, Bradley. "A Guide to Australia's Planned Strike Missiles." The Strategist, June 29, 2023. <https://www.aspistrategist.org.au/a-guide-to-australias-planned-strike-missiles/>

survivability of these systems at the ranges proposed in a competitive environment is highly questionable. The F/A-18F is not a stealth platform, the F-35 would be required to carry both missiles on external pylons due to the missile's size negating the F-35 stealth characteristics and the P-8A is a large slow ISR Platform. In a contested environment, a strike at these ranges would require usage of jamming, refuelling and supporting assets in a narrow, small pool of air domain assets. The strike would require accepting significant risk of losing platforms in a contested environment due to the complexity and distances involved.

In the naval domain, Australia will acquire the Tomahawk missiles for use in the Hobart Class Air Warfare Destroyers (AWD) with a range of 1,500 kilometres.¹⁸ The Tomahawk is a sophisticated and proven missile. However, with only three AWD platforms in total, Australia would be at a stretch to put two AWDs in a taskforce. This taskforce would then be required to close within 1,500 kilometres of a target in a contested environment without a full complement of air-defence missiles as several VLS cells would be occupied with Tomahawk missiles. In the land domain Australia is acquiring the High Mobility Artillery Rocket System (HIMARS) the range is currently 70 kilometres, and participating in the Precision Strike Missile (PrSM) with an expected range of 500 kilometres in the short term which does not qualify as long-range.

As announced in 2022 under pillar one of the AUKUS agreement, Australia will acquire SSN submarines.¹⁹ These submarines see a significant increase in capability in ASuW, ASW, intelligence, and reconnaissance. They will also provide the most potent long-range strike capability the ADF has ever fielded. Australia will initially acquire three to five Virginia class submarines with 12 VLS capable of firing the Tomahawk cruise missile; submarines can move undetected through the archipelago to strike at very long range. While the AUKUS design submarine is still in development, it is not expected until the "early 2040s" more than two decades away.²⁰

Australia has limited long-range strike options until the Virginia SSN submarines provide effective long-range strike capability in 2040. The optimal pathway report slates the first Virginia SSN acquisition in 2034, with likely an additional submarine every two or three years. Naval capability requires three platforms to provide one on station, with one in maintenance, one on training and working up, and one deployed to theatre. Australia's proposed three Virginia class submarines will be able to provide one on station continuously by 2040 at the earliest. While contingency has not been disclosed publicly, there are many hurdles for US and Australian politicians to overcome and significant training and knowledge transfer required. Coupled with the history of Australia regularly failing acquisition timelines, the risk of achieving this 2040 timeline is significant with recent unconfirmed reports saying the plan is already two to three years late.²¹

The DSR outlines that Australia has lost its ten-year strategic warning time; it is adopting

¹⁸ "Australia Invests in Powerful New High-Tech Missiles," August 21, 2023.

<https://www.minister.defence.gov.au/media-releases/2023-08-21/australia-invests-powerful-new-high-tech-missiles>

¹⁹ "Joint Media Statement: Australia to Pursue Nuclear-Powered Submarines through New Trilateral Enhanced Security Partnership," September 16, 2021,

<https://www.minister.defence.gov.au/statements/2021-09-16/joint-media-statement-australia-pursue-nuclear-powered-submarines-through-new-trilateral-enhanced-security-partnership>

²⁰ "Optimal Pathway," January 30, 2024, <https://www.asa.gov.au/aukus/optimal-pathway>

²¹ Creighton, Adam. "Construction of Virginia Class Submarines Is Running Two to Three Years Late." *The Australian*, April 4, 2024. <https://www.theaustralian.com.au/world/construction-of-virginia-class-submarines-is-running-two-to-three-years-late/news-story/7f38f57cfba4079709aa5fb2814fff7a>

a strategy of denial through A2AD where long-range strike is critical. While the recommended force design provides some long-range strike capabilities in the near term, there would be significant survivability challenges from these platforms in a conflict with the PRC until the Virginia SSNs arrive at scale in 2040 or later.

This paper recommends for a broad force structure; Australia should acquire the B-21 Bomber to provide a survivable long-range strike capability from 2030, and to supplement the SSNs from 2040. Northrop Grumman was selected to build the B21 in 2015 to replace the B-1 Lancer and B-2 Spirit and eventually B-52 Stratofortress as they reach their end of life. They have recently commenced low-rate production²² with the bomber taking its first flight in November 2023.²³ It is estimated to have similar capabilities to the B2 Bomber which has 11,000 kilometre range, and a payload of 12 anti-ship strike missiles or 50-60 250 Kilogram JDAMs. This is a similar payload as six F35 Lightnings at four or five times the combat radius. Australia can take an approach like the F-35 and acquire one platform from each of the initial low-rate production rounds, roughly expected to take one year each, providing Australia with six airframes by 2030, and 12 by 2034 once full production starts. Following the rule of three, this provides Australia with a broad force structure with a survivable long-range strike capability by 2030, ten years before the arrival of an SSN capability.

Land force flexibility

The DSR force design provides a Land force that has very little capability other than A2AD nodes, leaving no credible capability against a Chinese Amphibious Brigade. The DSR has identified that the land force must project into the archipelago to facilitate A2AD. Positioning forces in Australia will have limited ability to project into the archipelago due to the limited range of land-based systems. A2AD nodes forward deployed on islands to the north have unique characteristics of persistency, concealment and dispersion when compared to the Air and Naval Surface platforms achieving the same task.

There are arguments that Infantry Fighting Vehicles (IFV) and Main Battle Tanks (MBT) are not suited to the terrain in the archipelago to the north. There has been significant development in the nations in the archipelago and southern islands of the South China sea. While there are still areas that are reached only by foot, there are over 500,000 Kilometres of road in Indonesia²⁴ which have also seen a reduction in jungle coverage, losing 18% of its tree cover

since 2001 (Figure 1)²⁵. The Indonesian military themselves have over 100 MBTs and are currently adding more tanks to their military. In 1942 less than 50 light and medium tanks made a significant impact to the Japanese advance against a numerically superior force leading to the fall of Singapore.²⁶ While there would be challenges for heavy armour

²² Marrow, Michael. "B-21 Raider Stealth Bomber in Production,," Breaking Defense (blog), January 22, 2024. <https://breakingdefense.sites.breakingmedia.com/2024/01/b-21-raider-stealth-bomber-in-production-pentagon-says/>

²³ Stone, Mike, and David Swanson. "US Air Force's New B-21 Raider Takes First Flight." Reuters, November 11, 2023, sec. Aerospace & Defense. <https://www.reuters.com/business/aerospace-defense/us-air-forces-new-b-21-raider-flying-wing-bomber-takes-first-flight-reuters-2023-11-10/>

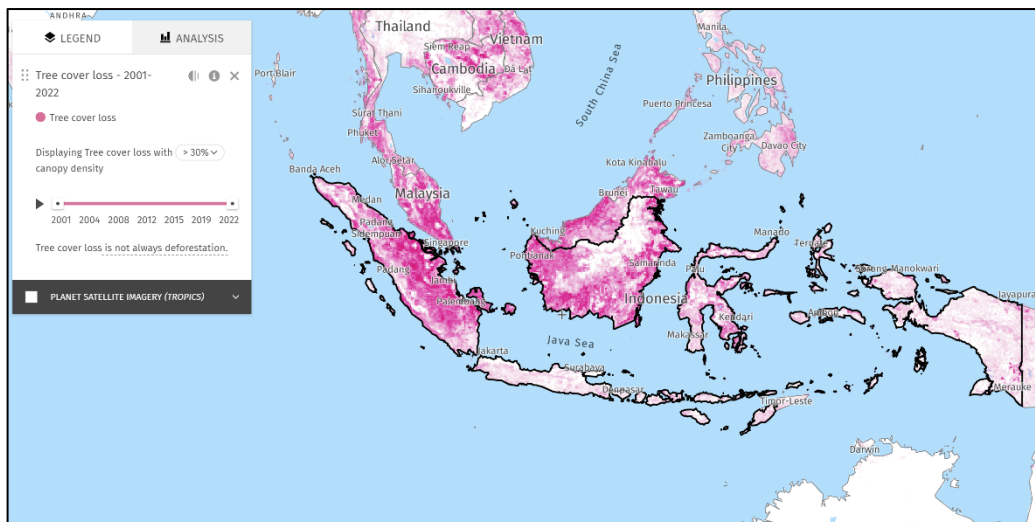
²⁴ Worlddata.info. "Transport and Infrastructure in Indonesia." <https://www.worlddata.info/asia/indonesia/transport.php>

²⁵ Vizzuality. "Indonesia Interactive Forest Map & Tree Cover Change Data | GFW." <https://www.globalforestwatch.org/map/country/IDN/>

²⁶ Bayly, Christopher Alan, and Timothy N. Harper. *Forgotten Wars: Freedom and Revolution in Southeast Asia*. First Harvard University Press paperback edition. Cambridge, Massachusetts: The @Belknap Press of Harvard University Press, 2010.

in the wet season and in areas of jungle, there remains a credible risk of PRC using its powerful amphibious force in the northern archipelago.

Figure 11



The PRC may decide to occupy a location in the archipelago to protect a flank in a conflict with the US, control global sea lines of communication through a key straight, or base forces to enable strike against Australia's north. To achieve this, they would likely use one of their amphibious brigade which has the mass to dominate a local area. An amphibious brigade would be challenging to dislodge with Australia's limited long-range strike options due to the number of targets an amphibious brigade presents. The PRC Peoples Liberation Army Land Force (PLALF) currently fields six amphibious Brigades and is rapidly expanding their Peoples Liberation Army Navy Marine Corps (PLANMC) brigade's with the following force structure:

- Four combined arms battalions, each with two amphibious assault gun companies, two amphibious mechanized infantry companies, and a firepower company.
- One reconnaissance battalion with amphibious recon vehicles.
- One artillery battalion with amphibious 122mm howitzers, tracked 122mm rocket launchers, and anti-tank guided missile systems.
- One air defence battalion with tracked anti-aircraft gun systems, short-range surface-to-air missile systems, and MANPADs.²⁷

If the limited Australian A2AD resources failed to dislodge a PRC amphibious brigade and the ADF was called to deploy its one mechanised brigade it would consist of:

- One armoured battalion with three companies of M1A2 SEP3 MBT

²⁷ Blasko, Dennis J. "The PLA Army Amphibious Force." China Maritime Report No 20. CMSI China Maritime Reports, 2022

- Two Infantry Battalions – Three Companies mechanised infantry of redback infantry fighting Vehicles. Three companies mechanised infantry of Bushmaster PMV.
- One reconnaissance battalion with three companies of Boxer Combat Reconnaissance Vehicles
- One Artillery Battalion with companies of Huntsman 155 SPH and HIMARS Rockets
- One air defence battalion with three companies of NASAMS and other air defence capabilities.
- A combat aviation battalion comprising of AH-64 Apache Attack Helicopter, UH-60M Black Hawk and CH-47 Chinook Air Mobility Helicopters.²⁸

The three PMV motorised companies cannot survive the 0-400m close fight and would be limited to rear area security for the Brigade combat service support.

From a quantitative comparison the most combined arms combat weight comes from mechanised infantry. Here the PRC would field eight mechanised infantry companies compared to Australia's three. In total combined arms teams Australia would field two battalion sized combined arms teams where PRC would field four. While Australian platforms are equal or better than those from the PRC, this is an insurmountable challenge and means the Australian mechanised brigade would not be effective against a PRC amphibious brigade due to the lack of IFVs.

This paper recommends that Australia acquire the originally planned 450 vehicles. This would provide a broad force design enabling security and protection of A2AD nodes, four mechanised infantry battalions on the Redback IFV²⁹ assessed as equal or better than the PRC ZBD-05³⁰. This would allow rotation of forces allowing Australia to maintain a brigade combat effective for longer. With the capability overmatch in other platforms in the brigade and the higher professionalism and training, Australia would have a broad land force structure to handle unforeseen contingencies.

Conclusion

The 2023 Defence Strategic Review (DSR) proposes a force design intended to navigate the complexities of the upcoming two decades, marked by unpredictable strategic challenges and potential conflict with the PRC. This paper argues that while the DSR attempts to align Australia's defence capabilities with perceived future threats, it does not provide a broad enough force design in several critical areas, thus not fully meeting the demands over the next twenty years.

Firstly, the DSR's emphasis on denial, focusing largely on Anti-Access/Area Denial (A2AD), is too narrow. This approach is heavily reliant on assumptions about the PRC, allies, and global partners that have historically been proven inaccurate. The DSR underestimates the necessity of a broad force design capable of mitigating risks associated with these uncertainties. While it aims to provide clarity and direction, the focused force design lacks the flexibility and agility needed to respond to unforeseen

²⁸ Commonwealth of Australia, Department of Defence; "Major changes to Army announced | | Defence." Website. <https://www.defence.gov.au/news-events/news/2023-09-28/major-changes-army-announced>

²⁹ "ODIN - OE Data Integration Network." <https://odin.tradoc.army.mil/Search/WEG/k21>

³⁰ "ODIN - OE Data Integration Network." [https://odin.tradoc.army.mil/WEG/Asset/ZBD-05_\(ZBD-2000\)_Chinese_Amphibious_Infantry_Fighting_Vehicle](https://odin.tradoc.army.mil/WEG/Asset/ZBD-05_(ZBD-2000)_Chinese_Amphibious_Infantry_Fighting_Vehicle)

challenges.

Secondly, the A2AD strategy's is not viable due to the absence of a survivable long-range strike capability until the expected introduction of SSNs in 2040. Although efforts to enhance long-range strike capabilities through acquisitions such as the JASSM-ER and Tomahawk missiles are underway, these platforms face survivability challenges in contested environments. The acquisition of B-21 Bombers, recommended by this paper, would address this gap by providing a viable long-range strike option a decade prior to the SSNs, significantly enhancing Australia's strategic posture.

Thirdly, the DSR's narrow focus extends to the land domain, which is inadequately prepared for potential engagements with PRC amphibious forces. The limited A2AD capabilities and the proposed reduction in the acquisition of Infantry Fighting Vehicles (IFVs) leave Australia vulnerable to amphibious assaults. This paper suggests that adhering to the original plan of acquiring 450 IFVs would significantly bolster Australia's capability to protect A2AD nodes and offer a more resilient force structure if it was ever required to engage a PRC amphibious brigade.

In conclusion, while the DSR outlines a strategic vision for Australia's defence, it critically overlooks the importance of flexibility, agility, and broad force design in addressing the multifaceted challenges of the next two decades. To ensure Australia's defence force is adequately postured to meet growing strategic challenges, it must diversify its capabilities beyond a narrow focus on A2AD, incorporate survivable long-range strike options before 2040, and enhance its land domain strategies to counter a wider array of potential threats.

References

“Defence Strategic Review Terms of Reference for the Independent Leads of the Review.” <https://www.pm.gov.au/media/defence-strategic-review>

Tian, Yew Lun. “China Will Never Renounce Right to Use Force over Taiwan.” Reuters, October 16, 2022. China. <https://www.reuters.com/world/china/xi-china-will-never-renounce-right-use-force-over-taiwan-2022-10-16/>

“Defense Policy - Ministry of National Defense.” <http://eng.mod.gov.cn/xb/DefensePolicy/index.html>

Mitter, Rana, and Elsbeth Johnson. “What the West Gets Wrong About China.” Harvard Business Review, May 1, 2021. <https://hbr.org/2021/05/what-the-west-gets-wrong-about-china>

Babbage, Ross. *The next Major War: Can the US and Its Allies Win against China?* Amherst, New York: Cambria Press, 2023

“National Defence, Defence Strategic Review”

“The Importance Of Strategically Focused Force Design | Future Forge.” Accessed April 7, 2024. <https://theforge.defence.gov.au/article/importance-strategically-focused-force-design>.

Macgregor, Douglas. “Thoughts on Force Design in an Era of Shrinking Defence Budgets.” *Joint Force Quarterly*, no. 63 (Quarter 2011).

“Battle of France | History, Summary, Maps, & Combatants | Britannica,” March 9, 2024. <https://www.britannica.com/event/Battle-of-France-World-War-II>

“US Approves JASSM ER Sale to Australia - Australian Defence Magazine.” <https://www.australiandefence.com.au/defence/joint/us-approves-jassm-er-sale-to-australia>

Gloury, Darren. “Should Australia’s Navy Have More Hobart-Class Air Warfare Destroyers?” *The Strategist*, September 16, 2021. <https://www.aspistrategist.org.au/should-australias-navy-have-more-hobart-class-air-warfare-destroyers/>

Beardsworth, James. “Explainer: Is Russia Running Low on Missiles?” *The Moscow Times*, May 17, 2022. <https://www.themoscowtimes.com/2022/05/17/explainer-is-russia-running-low-on-missiles-a77704>

Department of Defence. “Medium Range Ground-Based Air Defence | Defence.” Website. Accessed April 3, 2024. <https://www.defence.gov.au/defence-activities/projects/medium-range-ground-based-air-defence>

Marcus Hellyer, and Andrew Nicholls. "Impactful Projection': Long-Range Strike Options for Australia." *ASPI*, December 2022. Page 11
<https://www.aspi.org.au/report/impactful-projection-long-range-strike-options-australia>.

Perrett, Bradley. "A Guide to Australia's Planned Strike Missiles." *The Strategist*, June 29, 2023. <https://www.aspistrategist.org.au/a-guide-to-australias-planned-strike-missiles/>

"Australia Invests in Powerful New High-Tech Missiles," August 21, 2023.
<https://www.minister.defence.gov.au/media-releases/2023-08-21/australia-invests-powerful-new-high-tech-missiles>

"Joint Media Statement: Australia to Pursue Nuclear-Powered Submarines through New Trilateral Enhanced Security Partnership," September 16, 2021,
<https://www.minister.defence.gov.au/statements/2021-09-16/joint-media-statement-australia-pursue-nuclear-powered-submarines-through-new-trilateral-enhanced-security-partnership>

"Optimal Pathway," January 30, 2024, <https://www.asa.gov.au/aukus/optimal-pathway>

Creighton, Adam. "Construction of Virginia Class Submarines Is Running Two to Three Years Late." *The Australian*, April 4, 2024.
<https://www.theaustralian.com.au/world/construction-of-virginia-class-submarines-is-running-two-to-three-years-late/news-story/7f38f57cfba4079709aa5fb2814fff7a>

Marrow, Michael. "B-21 Raider Stealth Bomber in Production,." *Breaking Defense* (blog), January 22, 2024. <https://breakingdefense.sites.breakingmedia.com/2024/01/b-21-raider-stealth-bomber-in-production-pentagon-says/>

Stone, Mike, and David Swanson. "US Air Force's New B-21 Raider Takes First Flight." *Reuters*, November 11, 2023, sec. Aerospace & Defense.
<https://www.reuters.com/business/aerospace-defense/us-air-forces-new-b-21-raider-flying-wing-bomber-takes-first-flight-reuters-2023-11-10/>

Worlddata.info. "Transport and Infrastructure in Indonesia."
<https://www.worlddata.info/asia/indonesia/transport.php>

Vizzuality. "Indonesia Interactive Forest Map & Tree Cover Change Data | GFW."
<https://www.globalforestwatch.org/map/country/IDN/>

Bayly, Christopher Alan, and Timothy N. Harper. *Forgotten Wars: Freedom and Revolution in Southeast Asia*. First Harvard University Press paperback edition. Cambridge, Massachusetts: The @Belknap Press of Harvard University Press, 2010.

Blasko, Dennis J. "The PLA Army Amphibious Force." *China Maritime Report No 20*. CMSI China Maritime Reports, 2022

Commonwealth of Australia, Department of Defence; “Major changes to Army announced | Defence.” <https://www.defence.gov.au/news-events/news/2023-09-28/major-changes-army-announced>

“ODIN - OE Data Integration Network.” <https://odin.tradoc.army.mil/Search/WEG>

