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Talk us through AUKUS

…and Australia's dream submarine

The 2021 AUKUS announcement came with the promise of a sovereign Australian fleet of nuclear-powered submarines. Nearly 18 months on, however, it remains unclear if these submarines will ever be delivered—or if Australia actually needs them.

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Summary

The AUKUS agreement was announced to much fanfare in September 2021. The headline feature of this "enhanced trilateral security partnership" between Australia, the United Kingdom and the United States of America was its "[commitment] to a shared ambition to support Australia in acquiring nuclear-powered submarines for the Royal Australian Navy."[1]

Nearly 18 months later, AUKUS remains essentially an exercise in political theatre, lacking in both legal enforceability and a wealth of practical detail—and Australia is no closer to the actual acquisition of nuclear-powered submarines than it was when the agreement was announced.

When, or whether, Australia might actually ever see delivery of either the options notionally available to it via AUKUS—the US-designed Virginia-class submarine and the UK-designed Astute class—is very much open to question. The USA's shipyards are struggling to meet its own requirements for the former, let alone Australia's, while the UK has taken nearly two decades to construct seven of the latter. The last is still on the way.

Both submarines will be nearing obsolescence if and when they are delivered, needing to be superseded by as-yet-unannounced designs, further complicating matters and potentially extending delivery timelines into the 2060s.

More to the point, it also remains unclear, at best, whether the acquisition of nuclear-powered submarines would be in Australia's best interests. The RAN has no experience or expertise in operating such submarines, meaning that it would be left dependent on the US or UK for construction and training. As a non-nuclear weapons state in good standing, Australia would need to settle an agreement with the International Atomic Energy Agency to cover Highly Enriched Uranium fuelling the reactors. And AUKUS places Australia squarely into the USA-China contest, without any accompanying US guarantee of military assistance if Australia were to find itself in danger.

Australia's eagerness to jump at the chance to acquire nuclear-powered submarines, blithely ignoring both the practical challenges of acquiring and operating such vessels and the risk involved in committing to such a significant purchase, exemplifies systemic problems in our approach to defence policy. These include a preoccupation with perceived threats that distracts us from basing strategic policy on Australia's national interests, a reliance on notions of "mateship" with the great and powerful based more on sentiment

[1] White House Briefing Room (2021) *Joint Leaders* [sic] *Statement on AUKUS*, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/15/joint-leaders-statement-on-aukus/

and selective reading of history than on present-day reality, and the desire for a “sovereign” naval industry.

While the promise of a fleet of nuclear-powered submarines is tantalising to some in Australia’s defence establishment, the decision on how to replace our existing fleet of Collins-class submarines should be based on a clear-eyed examination of Australia’s unique strategic requirements, along with an in-depth analysis of strategic circumstances and strategic challenges. The strategic policy assumptions underpinning nuclear propulsion are unclear and unargued. The notion that a direct military threat from China justifies the proposal is insupportable by evidence at this time.

Committing to a nuclear submarine purchase under AUKUS without undertaking such analysis represents putting the cart before the horse. The question should be whether strategic policy requires nuclear submarines, not how policy should accommodate them because of their availability.

Introduction

The triumph of hope over experience is an enduring leitmotif in Australian public policy. The hopes that gave us the Ord River scheme remain largely unrealised. The Bradfield scheme and its dreams of diverted waters delivering eternal agricultural life continue to fascinate some parts of the Australian polity and excite the imaginations of the National party. Malcolm Turnbull's hopes for the Snowy hydro-battery have already turned into a cash sink, with a major contractor going into voluntary administration.[2]

In the realm of Defence, the prevailing hope is controlling the seas, thus denying potential adversaries the ability to exercise sea power, even in their home waters—and, ideally, by doing so with ships built in Australia. In the same way that the dreams of irrigating the vast arid areas of central Australia have led to a great deal of expenditure and little in the way of results, the hope of sea control risks swamping both Australia's force capability planning and defence budget for decades to come. And at the centre of this risk is AUKUS (Australia-United Kingdom-United States), with its tantalising hopes for a fleet of domestically-built nuclear-powered submarines—a fleet that would be unprecedented in both scope and cost for the Royal Australian Navy (RAN).

Australian Defence policy has long been characterised by the tension between the desire for "sovereign" capabilities—i.e. equipment and strategies designed specifically for Australian use, and manufactured domestically—and the enormous investments required to establish and maintain such capabilities. As Cameron Stewart put it in *The Australian* over a decade ago: "Does Canberra keep risking billions of dollars to subsidise a small and struggling defence industry for the sake of nation-building, knowing that the flip-side of creating jobs by approving large, complex local defence projects such as the AWDs is the probability, if not the certainty, of enormous cost overruns and delays?"[3]

The various branches of the Defence forces have taken differing approaches to this question. The RAN is currently struggling with the Hunter class frigate program[4]—the outturn costs (i.e. build and support costs) of which are already estimated to exceed $45 billion—to the extent that a former Chief of Navy is advocating abandoning the project and

[2] Wiggins (2023) "Collapsed Clough owes creditors $248 million", *Australian Financial Review*, https://www.afr.com/companies/infrastructure/collapsed-clough-owes-creditors-248-million-20230122-p5cejk

[3] Stewart (2011) "Government and industry out of their depth on defence procurement", *The Australian*, https://www.theaustralian.com.au/nation/politics/government-and-industry-out-of-their-depth-on-defence-procurement/news-story/1cc22da2f664bd2cc4dbee3a62a1945b

[4] Hellyer (2022) "Hunter-class frigate report indicates Australian naval shipbuilding in disarray", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/hunter-class-frigate-report-indicates-australian-naval-shipbuilding-in-disarray/

redesigning the frigate.[5] If the sunk costs of the failed Attack class submarine program (based on the French Barracuda design) are also taken into account, around $50 billion will have been flushed down the defence expenditure drain with nothing to show for it. The opportunity costs have been enormous.

Of course, Defence is familiar with such project failures and cancellations: early in the life of the first Rudd government, the Minister for Defence Joel Fitzgibbon had to announce the cancellation of navy's Seasprite helicopter project, writing off over a billion dollars' worth of investment.[6] This was followed by a barrage of horror stories and bad publicity focused on the Air Warfare Destroyer program. Nevertheless, naval shipbuilding continues to be the Holy Grail of Australian heavy industrial capacity—a status granted without much consideration of either the real economic benefits or the downstream opportunity costs.

Elsewhere, the picture is quite different. Australia neither designs nor builds its own strike or support aircraft, but the ADF seems quite unperturbed at the lack of sovereignty in the design or construction of its air fleet. Long gone are the days of the Boomerang, the Wirraway and the Nomad. Nor has Australia retained the ability to design and construct tanks or weapons for the Army. While armoured fighting vehicles—the Bushmaster and Hawkei (both of them successful vehicles)—are manufactured in Australia, it should be noted that in 2018 the Auditor General queried whether Australia's joining the US-led Joint Light Tactical Vehicle project might have offered better value for money.[7]

On the whole, though, it seems that the days of turning defence procurement into an instrument for industrial nation-building are not yet over. Governments continue to favour employing the Defence budget as a muti-dimensional pork barrel, creating a bit of advanced naval design capability here, a bit of advanced engineering capability there, a bit of heavy industry somewhere else, and an advanced submarine skills workforce in South Australia when the relevant trade skills and training institutions are in New South Wales and Victoria.

But suddenly, we are to believe that this conundrum has been resolved. AUKUS has been presented as a kind of strategic cornucopia, one that will deliver untold—and certainly unexplained—future security benefits and defence capabilities. America and Great Britain to the rescue. Really?

[5] Shackleton (2022) "Australia's Hunter-class frigate program must be stopped and redirected", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/australias-hunter-class-frigate-program-must-be-stopped-and-redirected/

[6] Fitzgibbon (2008) "Seasprite helicopters to be cancelled", Department of Defence, https://web.archive.org/web/20080311071450/http:/www.minister.defence.gov.au/Fitzgibbontpl.cfm?CurrentId=7480

[7] Auditor-General (2018) *Army's Mobile Protected Vehicle—Light*, Australian National Audit Office, https://www.anao.gov.au/sites/default/files/Auditor-General_Report_2018-2019_6.PDF

What is AUKUS (besides an acronym)?

When explaining what AUKUS is, it's perhaps easier to start with what it *isn't*. Unlike ANZUS, it is not a treaty. Nor is it an inter-governmental agreement specifying responsibilities and liabilities. Nor is it an "exchange of notes" (to use the quaint diplomatic term) signalling firm intentions on the part of each of the three governments involved.

At present, AUKUS is no more than a statement by three political leaders. Its emergence in September 2021 as a "Joint Leaders Statement"[8] was little more than an exercise in political expediency conceived by former Australian and UK Prime Ministers Scott Morrison and Boris Johnson, both of whom faced deteriorating domestic political situations at the time of the announcement, and both of whom were no strangers to playing the national security card at such moments. US President Joe Biden was essentially an obliging if somewhat distracted co-sponsor: his inability to remember Morrison's name at the carefully staged announcement suggests something less than total commitment or engagement. (The perturbations and rumblings in the US Congress[9] and the US Navy[10] appear to confirm this impression.)

The AUKUS partnership rests on two "pillars". The first is "an optimal pathway to deliver a nuclear powered submarine capability", while the second is "enhancing the three nations' technological edge".[11] But at this early stage, AUKUS resembles less an impressive edifice founded on two sturdy pillars than it does a two-legged stool: it requires considerable determination and a strong sense of balance to get it to work.

Lacking any legal enforceability, the Joint Statement is no more than a statement of intent, committing the three countries to do no more than they already do: partner extensively in the defence and security domains in pursuit of their individual and joint national interests. Its specific focus is to support Australia "in acquiring nuclear-powered submarines".

[8] White House Briefing Room, op cit.

[9] Karp (2023) "US senators urge Joe Biden not to sell 'scarce' US submarines to Australia", *The Guardian*, https://www.theguardian.com/world/2023/jan/06/us-senators-urge-joe-biden-not-to-sell-scarce-nuclear-submarines-to-australia

[10] Thomas (2022) "US Navy wants to chop six months off build time of Columbia-class submarines", *Naval Technology*, https://www.naval-technology.com/analysis/us-navy-wants-to-chop-six-months-off-build-time-of-columbia-class-submarines/

[11] Department of Defence (2022) "AUKUS: A new partnership for joint capability development" in *Department of Defence Annual Report 2021-22*, https://www.transparency.gov.au/annual-reports/department-defence/reporting-year/2021-22-6

Morrison's defeat in the general election barely eight months after the announcement of AUKUS left it to his successor, Prime Minister Anthony Albanese, with the task of sitting on the AUKUS stool. Shortly after taking office, he reaffirmed Australia's commitment to acquiring "conventionally armed, nuclear-powered submarines . . . at the earliest possible date".[12] The first milestone is March 2023, when the recommendations of a Defence Strategic Review,[13] conducted by a former Defence Minister, the Hon. Stephen Smith, and a former Chief of the Australian Defence Force, Sir Angus Houston, are to be considered by the Government.

It is anticipated that the Review will confirm the preliminary assessments of both the previous and current governments, which is that developments in Australia's strategic circumstances warrant a step-change in Australia's submarine and undersea warfare capabilities. Widespread opinion notwithstanding, it will be interesting to see what evidence of "clear and emerging (if not present) danger" the Review might provide to substantiate a fundamental redirection of strategic policy and a reorientation of the nation's defence force structure. We can only hope that the authors grasp the difference between force structure and force posture, as outlined in The Australia Institute's earlier paper on the Defence Strategic Review.[14] The difference comprehends at least eight inter-related facets: capability; disposition; location; regional defence connectivity; preparedness; readiness; sustainment and professionalism.

[12] Prime Minister of Australia (2022) "Joint leaders statement to mark one year of AUKUS", https://www.pm.gov.au/media/joint-leaders-statement-mark-one-year-aukus

[13] Department of Defence (2022) "Defence Strategic Review", https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review

[14] Behm (2022) *Defence strategic review: Submission*, The Australia Institute, https://australiainstitute.org.au/wp-content/uploads/2022/10/P1310-Defence-Strategic-Review-Web.pdf

Do we need AUKUS?

The simple answer to the question, "Do we need AUKUS?" is that we do not know yet. The rationale for the program presumes a particular but unargued force capability outcome from an as-yet-unrealised root-and-branch review of Australia's strategic policy in the light of yet-to-be analysed changed strategic circumstances and unevaluated strategic challenges. The premise that the availability of nuclear propulsion should determine strategic policy is tantamount to positing advances in technology as the driver of strategy. To put it in domestic terms, a microwave oven is no guarantor of a good meal.

The various cooperation targets included in the Joint Leaders' statement are little more than padding for the central enterprise, which is nuclear propulsion for the RAN's submarines and the involvement of the UK and the US as partners. By pre-empting decisions on the more basic issues of strategic rationale for nuclear propulsion, the ability of the national industrial infrastructure to manage the construction and support of a new generation of submarine, and the capacity of the national economy to pay for an effective number of platforms, AUKUS is a hostage to fortune.

Beyond the questions of necessity and utility, AUKUS represents a more profound problem with Australia's approach to defence: it is yet another symptom of Australia's deep-seated insecurity and isolation. We are distracted by our preoccupation with threats from a focus on national interests as the basis for long-term strategic policy. This preoccupation both foments fear and legitimises dependence on the great and powerful as the ultimate bulwark against our deep national insecurities. So AUKUS is a symptom of policy inhibition, of a reluctance to exercise our agency and realise our latent power—which is considerable.

AUKUS constitutes a systemic transfer of sovereignty. Yes, the United Kingdom and the United States are our traditional friends. But with respect to our national defence, they do not have financial or national security skin in the game. Our gushing paeans of praise for enduring mateship may serve short-term political purposes, but they are also emblematic of a more fundamental insecurity, insouciance and naivete. These issues were all exemplifed by the "100 years of mateship" campaign, launched in 2018 as Australia tried to come to grips with an unpredictable, irascible and volatile President Trump. This campaign was political spin built on a highly selective reading of history and the characters who populate it. As Professor James Curran commented at the time, "The fundamental problem with the 'mateship' project . . . is that it represents once again the apparent triumph of stale thinking, and the lazy fusion of the Anzac legend with the US alliance".[15]

[15] Curran (2017) "Joe Hockey and the limits of mateship", Lowy Institute, https://www.lowyinstitute.org/the-interpreter/joe-hockey-limits-mateship

Hope is realised through ambition. But if AUKUS is an expression of hope, it is also a substitute for ambition. AUKUS transfers ambition's centre of gravity from self-actualisation, self-realisation and self-reliance to third parties, to partners who reap the benefits of providing inputs without carrying the risks of suboptimal or failed delivery of outcomes. The Australian taxpayer carries the total risk of financial failure, and the ADF carries the risk of capability failure. As The Australia Institute pointed out in an earlier report,[16] those risks are high.

[16] Behm et al (2022) *Australia's Future Submarines: An Explainer*, The Australia Institute, https://australiainstitute.org.au/wp-content/uploads/2022/11/Submarine-Explainer-WEB.pdf

Who gets what out of AUKUS?

For a small partnership, the various benefits of AUKUS are distributed differently and unevenly. The economic benefits lie clearly with the supplier, which will be whichever of the US and UK (assuming France continues to be excluded as a supplier) is finally chosen for the basic nuclear propulsion design. The capability dividend will be shared, though ultimately the US would appear to derive the greatest benefit, since it will inevitably exercise a considerable measure of influence and control over certification of both crew[17] and capability,[18] and the additional submarine capacity will offer operational benefits to the US Pacific Command. The US will also share the management of a nuclear propulsion safety regime.[19]

While possible bottlenecks in the US construction will generate a measure of risk for the US should the Virginia class (or another US design) eventuate as the preferred design, most of the risk burden will fall onto Australia's shoulders. In the commercial world, a partnership such as AUKUS would collapse—the recent collapse of the two-partner Sun Cable project, which aimed to deliver of renewable electricity to Singapore, is a salutary case in point.[20]

THE UNITED KINGDOM

The Royal Navy (RN) and the RAN have a long history of submarine collaboration, which certainly whets the British appetite for prospective commercial advantage. This history goes right back to the very beginning of RN and RAN submarine operation. Australia's first two E-class submarines—HMAS AE1 and HMAS AE2—were purchased at the outbreak of WWI and played short-lived roles in the Solomon Sea and in The Dardanelles. Neither survived the conflict, and the loss of AE1 off New Britain in the first month of the war and the scuttling of AE2 in the Sea of Marmara in April 1915 were the RAN's only operational losses in WWI.

[17] Briggs (2021) "Making the shift to nuclear-powered submarines: training and recruiting", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/making-the-shift-to-nuclear-powered-submarines-training-and-recruiting/

[18] Briggs (2021) "Making the shift to nuclear-powered submarines: technical skills and oversight", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/making-the-shift-to-nuclear-powered-submarines-technical-skills-and-oversight/

[19] Briggs (2021) "Making the shift to nuclear-powered submarines: safety first", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/making-the-shift-to-nuclear-powered-submarines-safety-first/

[20] Powell (2023) "$25bn Sun Cable project collapses after dispute between Forrest, Cannon-Brookes", *The Sydney Morning Herald*, https://www.smh.com.au/business/companies/25b-sun-cable-project-collapses-after-dispute-between-forrest-cannon-brookes-20230111-p5cbvh.html

Nevertheless, as Prime Minister Deakin foresaw, submarines lent themselves well to the strategic task of maritime defence, and the British link with the RAN continued post-WWI. In the immediate post-WWI years, the RN transferred six J-class to Australia, but they were all in poor condition and were quickly decommissioned. Australia then purchased two O-class submarines, but returned them to the RN during the Depression.

The RAN did not own or operate submarines during WWII. After WWII, the RN stationed several T-class submarines to assist the RAN and the Royal New Zealand Navy (RNZN) in anti-submarine warfare training. In 1964, the RAN submarine service was reformed, and eight Oberon-class submarines were ordered from the UK, of which six were ultimately delivered. These highly capable vessels formed the backbone of the RAN's undersea capability for the next 30 years, until they were replaced by Collins-class submarines between 1996 and 2003. These Collins-class vessels remain in service.

But the relationship between the RN and RAN is not just built around the latter owning and operating the former's submarines. The deep cultural and professional alignment between the RN and the RAN also makes choosing a British-designed submarine under AUKUS an option that is attractive to both the UK and Australia. The two navies share a common heritage and continue to enjoy a close professional relationship. The Australian submarine training system, along with the concepts and doctrines that guide submarine operations, are closely aligned with the British models. So the UK's participation in scoping Australia's next generation submarine needs is not surprising. It is equally unsurprising that the two countries are approaching the AUKUS partnership on quite different terms. Quite simply, the UK wants money, while Australia is looking for capability.

When he announced Britain's participation in the AUKUS partnership, then-UK Prime Minister Boris Johnson put the UK's hopes squarely on the table: "Together with the other opportunities from AUKUS, [we are] creating hundreds of highly skilled jobs across the United Kingdom … [and] taking forward this Government's driving purpose of levelling up across the whole country."[21]

The economic benefits to the UK, especially if Australia were to be on the ground floor of a new submarine design to succeed the trouble-plagued Astute class, would be significant. Britain would be looking for a long-term Australian investment that would both amortise at least part of the costs of a new design and guarantee long-term construction jobs in the north of England. Should Australia come to the decision that local construction of an Astute follow-on submarine was a bridge too far for South Australian industry, and out of the reach of Australian industry more generally, the UK would celebrate its bonanza for decades to

[21] Prime Minister's Office (UK) (2019) "PM Statement on AUKUS Partnership", https://www.gov.uk/government/speeches/pm-statement-on-aukus-partnership-15-september-2021

come. As Johnson said, “This will be one of the most complex and technically demanding projects in the world, lasting for decades and requiring the most advanced technology”.[22]

THE UNITED STATES OF AMERICA

In comparison to the UK, the US has a much more hard-edged interest: defeating China in a Pacific war. It is looking to both attack (hunter-killer) and ballistic missile (assured nuclear second strike) submarine superiority in the Pacific. The website of the Pacific Submarine Force of the US Navy (USN) lists 31 submarines on its order of battle.[23] Eight of these are Los Angeles-class guided missile attack submarines, and two are Ohio-class ballistic missile submarines, to be replaced in due course by the new Columbia class. The other 21 are attack submarines of three classes: 11 Los Angeles-class, three Seawolf-class and five Virginia-class. As the older Los Angeles class submarines are retired, they will be replaced by Virginia-class boats. It is the Virginia class that Australia is contemplating.

As the strategic competition between the US and China intensifies, too many attack submarines would never be enough for the US. So the idea that a loyal ally such as Australia might be able to provide additional submarines—fully compatible with those of the USN—is attractive, at least to the theorists in Washington. At the same time, some of the realists in both the US Senate and the USN are concerned that production problems and supply chain bottlenecks could perhaps overwhelm US construction yards, which are already struggling to meet USN deadlines. These problems are being compounded by the performance delays in reaching scheduled maintenance targets for the existing Virginia-class boats.

These concerns were reflected in a US Government Accountability Office report published on 24 January 2023.[24] The report deals with risks associated with the Columbia SSBN[25] program, and draws attention in passing to the implications for the Virginia-class program. Tellingly, the report says:

> The Navy plans to deliver the first, or lead, *Columbia*-class submarine—the largest and most complex submarine in its history—more quickly than it did for the lead submarines of prior classes, such as the *Virginia*-class program. But the shipbuilder has not conducted a schedule risk analysis of the lead submarine's construction schedule. Both GAO leading practices and Department of Defense (DOD) guidance identify schedule risk analysis as a critical tool for understanding and managing

[22] Ibid.

[23] Subpac (n.d.) “Subpac Commands”, Commander, Submarine Force, US Pacific Fleet, https://www.csp.navy.mil/SUBPAC-Commands/Submarines/

[24] United States Government Accountability Office (2023) *Report to Congressional Committees: Columbia Class Submarine Program Lacks Essential Schedule Insight amid Continuing Construction Challenges*, https://www.gao.gov/assets/gao-23-106292.pdf

[25] “SSBN” is the US military’s term for a nuclear-powered submarine equipped with ballistic missiles.

> program risks that could impact the schedule. Without a statistical schedule risk analysis, programs have limited insight into how schedule risks could affect the likelihood of achieving key program milestones, including delivery, and the amount of margin—or a reserve of extra time—needed to manage critical risks and avoid delays.
>
> After more than a year of full-scale construction on the lead *Columbia* submarine, the shipbuilders are facing delays because of challenges with design, materials, and quality. The shipbuilders are working to mitigate delays using additional shipyard resources, such as more staff to complete work more quickly. Because of the *Columbia* class program's essential role in strategic deterrence, it has priority status over most national defense related programs, including the *Virginia* class program. The shipbuilder added staff to the *Columbia* class program who were originally planned for the *Virginia* class program, contributing to delays for that program. However, long-term planning does not account for shared risks between these programs that are likely to present production challenges and could result in additional costs. Without updated long-term planning, the Navy cannot be certain that the fiscal year 2024 budget request will be sufficient to meet the production schedule it has planned for these submarine classes.

This report provides the context within which comments by other senior USN officers should be construed—such as that by Rear Admiral Scott Pappano, programme executive officer for USN strategic submarines, who was reported in 2022 to have said, “If we were going to add additional [Australian] submarine construction to our base that would be detrimental right now”.[26]

Accordingly, it is unclear whether the US will be willing, or able, to meet Australia’s hopes for eight or more Virginia-class nuclear-powered submarines to join the RAN. Three inter-related questions arise: does the US stretch and slow down its production program to accommodate Australia; does the US increase its production capacity by investing in a third shipbuilding yard; do Australia and the US blend their submarine fleets through cooperative arrangements and co-manning?

These are make-or-break questions that demand answers before Australia commits itself to a submarine purchase as momentous—and costly—as one involving the acquisition of nuclear propulsion.

AUSTRALIA

In a Panglossian best of all possible worlds, Australia would emerge as the clear winner in the AUKUS partnership. In such a world, the UK and the US would be generous to a fault as

[26] Thomas, op cit.

they worked towards ensuring that Australia could own and operate nuclear-propelled submarines effectively. For its sizeable investment, Australia would acquire an advanced state-of-the-art underwater capability that would facilitate the deployment of a formidable strike capability well north of the equator, taking Australia's area of direct military interest to the Sea of Japan. While this would represent a remarkable extension of Australia's strategic focus from Australia's direct maritime approaches to China's home ports, it would also exercise a valuable deterrent effect. And, of course, were deterrence to fail, it would enable Australia to project strategic power sufficient to deliver the "impactful projection" advocated by the Minister for Defence.

Or would it? We do not live in a Panglossian world. We live in a chaotic world where strategic surprise is the norm. We live in a world where experience generally triumphs over hope. It is for this reason that Australia's defence planners need to mitigate the large element of risk that the next-generation submarine project carries, and do so well before commitments are made and large wads of cash are spent. We need to learn the many lessons of the aborted Shortfin Barracuda (French) project and the Collins project before it. Sadly, if experience and history are any guide, we will do no such thing, and will instead once again take on significant capability and financial risk without effective mitigation strategies. Caveat emptor!

Either way, it is important to realise that the most significant aspect of AUKUS is what it does *not* promise: the unfailing and unstinting military support of the US, come what may. While US participation in the AUKUS partnership sends an unmistakable signal to China that the US has alliances on which it can call, the AUKUS agreement does not commit the US to supporting Australia militarily were China to flex its muscles and throw its military weight around in the South Pacific or in South East Asia.

Despite this, AUKUS brings Australia squarely into the China-US contest. China's economic and strategic rise is deeply problematic for the US. But, at this point at least, China is not an existential threat to the US or its core interests. So Australia has taken upon itself an unusual and rather unbalanced role in the burgeoning tussle between the US and China by positioning itself as the canary in the coal mine, as The Lowy Institute's Nick Bisley noted when China imposed economic sanctions on Australia in 2016.[27]

Geography places Australia on the edge of Asia. The US is in Asia by choice and can play a role of its own choosing. It is not obliged to go to war on anyone else's behalf, including Australia's. To that extent, AUKUS is a risky bet on Australia's part,[28] because deepening its

[27] Bisley (2016) "Why Australia is the canary in the regional coalmine", The Lowy Institute, https://www.lowyinstitute.org/the-interpreter/why-australia-canary-regional-coal-mine

[28] Roggeveen (2021) "Australia is making a risky bet on the US", *The New York Times*, https://www.nytimes.com/2021/09/20/opinion/AUKUS-australia-us-china.html

engagement with the US does not constitute a guarantee of US military assistance should Australia find itself subject to military pressure.

What does AUKUS mean for Australian sovereignty?

Commentators have drawn attention to the possibility of a loss in national sovereignty were Australia to acquire a nuclear-propelled submarine from the US or the UK. Former Prime Minister Paul Keating, for instance, entered the AUKUS discussion early when he wrote, "This arrangement would witness a further dramatic loss of Australian sovereignty, as materiel dependency on the US would rob Australia of any freedom or choice in any engagement it may deem appropriate".[29] Professor Stephan Fruehling of the Australian National University, on the other hand, took a somewhat different tack when he remarked that reliance on the US (or the UK for that matter) represented a rejection of self-sufficiency and a choice consistent with "self-reliance in alliance".[30]

Like the words "strategy" and "posture",[31] "sovereignty" is one of those Humpty Dumpty words that means whatever its user chooses it to mean—"neither more nor less", as Lewis Carroll wrote. It is also important to remember that "sovereignty" is not an absolute. No country is absolutely sovereign, because all countries are linked in a complex web of treaties, agreements, understandings, commercial and investment relationships, membership of international institutions (such as the UN) and other arrangements that limit the absolute exercise of independent choice and action.

While politicians like to talk up the advantages of sovereign capabilities—such as naval shipbuilding—the fact is that global supply chains are an integral part of national self-sufficiency. For instance, Australia does not have a sovereign jet fighter capability, but relies instead on the US (and France) for deep support for almost all its military aviation assets. Even the US is not completely sovereign when it comes to the management and operation of the F-35 fighter, a multinational enterprise. The same applies to Australia's civil aviation, where deep engine maintenance is conducted offshore. And as one commentator pointed out, sovereignty with respect to submarine operations would require a national microchip industry.[32] Castles in Spain come cheaper.

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[29] Keating (2021) "This pact ties Australia to any US military engagement against China", *The Age*, https://www.theage.com.au/national/this-pact-ties-australia-to-any-us-military-engagement-against-china-20210916-p58s5k.html

[30] Fruehling (2021) "Does the AUKUS submarine deal compromise Australia's sovereignty?", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/does-the-aukus-submarine-deal-compromise-australias-sovereignty/

[31] Behm (2022), op cit.

[32] Palazzo (2022) "The definitive case against nuclear subs", *The Saturday Paper*, https://www.thesaturdaypaper.com.au/opinion/topic/2022/11/12/the-definitive-case-against-nuclear-subs

The real issue here is not sovereignty, but agency. Just how much agency will Australia be able to exercise within the AUKUS partnership? It is unlikely that the RAN will be able to certify either the operational status of nuclear-propelled UK/US sourced submarines or the professional competence of their crews. But when Washington—or, in less likely circumstances, London—asks Australia to provide submarines in support of their particular naval adventures, will an Australian government be able to decline? Given Australia's pattern of overseas military deployment since WWII, precedent at least would suggest that Australia would continue its practice of "all the way with the USA".

In the final analysis, the exercise of independent national agency is a fundamental geopolitical and geostrategic issue. The interests of allies are often complementary and sometimes overlap—but they are rarely, if ever, identical. Similarly, while the values that underpin those interests may align, they are never identical. So, whatever decision Australia may ultimately take on the question of nuclear-propelled submarines, it will be critical that Australian governments—along with their policy advisors and the citizens that elect them—are clear-eyed and totally devoid of assumptions and prejudice in their exercise of strategic judgement.

The dream submarine

The comments of many submarine advocates notwithstanding, "military off-the-shelf" (MOTS) submarines do not exist. Submarines are bespoke systems, built to order and manufactured to the specifications of the purchaser. Australia's geography dictates unique range, endurance and payload characteristics that cannot be met by European manufacturers whose strategic focus is principally bounded by the Baltic and North Seas. While submarines built by Japan and South Korea may meet the interests of Australia's neighbours (such as Singapore, Indonesia and Malaysia) where transit times are measured in days rather than weeks, these vessels are also insufficient for Australia's requirements.

Australia's ideal submarine is one that fulfils the following requirements:

- It can travel long distances quickly;
- It has a low indiscretion ratio (i.e. it does not spend much time on the surface recharging its batteries);
- It carries a sufficiently large weapons payload to maximise its effectiveness;
- It can undertake a range of different roles; and
- It has a submerged speed large enough to get out of harm's way should its position be compromised.

In selecting and constructing Australia's "dream submarine", two features dominate: propulsion system (nuclear or air-independent diesel) and size (dictated by range, payload and habitability considerations). In an ideal world—one in which Australia's technical and industry competencies include people skilled in the relevant nuclear science and nuclear reactor management—nuclear propulsion would be the go-to propulsion choice. In an earlier "submarine explainer", The Australia Institute outlined the distinct advantages of nuclear propulsion, which include removing the necessity to surface to charge batteries, and as a result, allowing limitless high-speed travel.[33]

However, as noted above, this is not an ideal world—and as the then-head of the submarine replacement program, Rear Admiral Greg Sammut, said during an entertaining exchange in the Senate in 2017,[34] nuclear propulsion was excluded as a matter of government policy from the design parameters on which the choice of the Shortfin Barracuda (the French submarine) was based. Its exclusion reflected the fact that Australia could neither design, construct nor support nuclear-propelled submarines.

[33] Behm et al (2022), op cit.

[34] https://www.youtube.com/watch?v=UYF08jJi9Hg

What has changed? Essentially, the politics. Nuclear propulsion is no more supportable by Australia in 2023 than it was in 2017. But the risk appetite has evidently risen. The following sections summarise the various options available, and the amount of risk involved.

THE HIGH-RISK OPTIONS: NUCLEAR PROPULSION—DREAM OR NIGHTMARE?

In the world of submarine design, construction, maintenance and operation, submarines are always high-risk options. These risks are often justified: as the Defence Science and Technology Group wrote in 2016, "although submarines are costly to acquire and run, they deliver a disproportionately large military effect".[35] They also impose disproportionately large defensive costs on the adversary.

Some risks, however, are much more significant than others, and when governments decide to commit to high-risk ventures, the benefits must outweigh the risks. It is not at all clear that Australia's current appetite for risk matches the benefits that might accrue.

The AUKUS partnership brings two nuclear propelled submarines into calculation, the American Virginia-class (and/or a successor version, the SSN(X), planning for which began in 2018) and the British Astute-class (and/or the successor version, the SSN(R), which is in the early stage of planning). These are both large submarines: the Virginia-class submarine weighs in at just under 8,000t and has a crew of 130, while the Astute-class weighs just over 7,000t and has a crew of 90. By way of comparison, the RAN's Collins class submarines displace less than half the US or British submarines, and have a complement of just over 50 people.

The Virginia-class is a tried and true attack submarine, limited only by the aforementioned construction capacity issues in the two naval dockyards where they are built and maintained. The design and delivery of the Astute-class, on the other hand, was plagued with problems. The initial concepts were developed in the late 1980s, around the same time that the Collins-class was designed and built, and the last of seven submarines is to be commissioned in 2026 (estimated)—almost two decades after the 2007 launch of the first of the class, the HMS Astute. We can only guess how long it might take for the UK to deliver eight submarines to Australia.

The UK and US submarines are quite different boats in both design and function. However, these differences are largely irrelevant to Australia's specific needs, where range, speed, endurance and payload are the main design requirements. Both are high-risk choices, a risk

[35] Department of Defence, Science and Technology (2016) *Australia's requirement for submarines*, https://www.dst.defence.gov.au/sites/default/files/publications/documents/DSC%201618%20-%20DST%20Submarine%20Report%20PRO4%20LR.pdf

that increases significantly if they were to be constructed in Australia. They are both heading towards obsolescence, which means that the SSN(X) and the SSN(R) must be brought into consideration, adding at least a decade to the construction and delivery timeline. That increases the acquisition, construction, financial and operational risk, extending the timeline beyond four decades. (Marcus Hellyer and Andrew Nicholls covered this issue comprehensively in a 2022 essay for *The Strategist*.[36])

For anyone who might imagine that a couple of used vessels, from either the UK or the US, could serve as an interim measure, Canadian experience suggests that the risk associated with second-hand vessels is insuperable.[37] The RAN would also be well advised to revisit the lessons of the mid-1990s acquisition of HMAS Manoora and Kanimbla from the USN: both proved very expensive (and substandard) "cheap" options.[38]

At this point, it is anyone's guess what the outturn cost of Australia's nuclear-propelled submarine ambitions might be. It was estimated in 2019 that even the doomed Attack-class submarines, based on the French Barracuda design but replacing nuclear propulsion with diesel engines, would cost around $225bn over their 50-year lifespan.[39] The answer to the old question "how long is a piece of string?" seems to be "as long as it wants to be".

This is totally unsatisfactory when it comes to such critical national decision-making. While it is good to have ambition, that ambition always must be tested against reality. Australia is a wealthy country: it can afford anything. It cannot afford everything.

Against objective criteria—capability risk, construction risk, delivery risk, support risk, operational risk and financial risk—both the Astute and Virginia designs are a bridge too far. They are excellent submarines, but well beyond Australia's industrial and operational capability at this point in our submarine development. Without a transition plan—and more of that below—the step-change from a well-performed diesel-powered submarine to a nuclear-propelled boat with twice the displacement must depend on US or UK construction and training.

As India discovered with its leasing experiences with ex-Soviet submarines, the RAN will potentially need US or UK seconded officers and crew. To go down that path would be a

[36] Hellyer and Nicholls (2022) "Australia's transition to nuclear-powered submarines could run into the 2060s", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/australias-transition-to-nuclear-powered-submarines-could-run-into-the-2060s/

[37] Hellyer (2021) "Can Australia get second-hand nuclear submarines? The UK option", *The Strategist*, Australian Strategic Policy Institute, https://www.aspistrategist.org.au/can-australia-get-second-hand-nuclear-submarines-the-uk-option/

[38] Oakes (2011) "Fatal accident fears over neglected navy fleet", *The Age*, https://www.smh.com.au/national/fatal-accident-fears-over-neglected-navy-fleet-20110215-1av50.html

[39] Packham (2019) "Cost of new submarines blows out to $225bn", *The Australian*, https://www.theaustralian.com.au/nation/defence/cost-of-new-submarines-blows-out-to-225bn/news-story/b4f7afa23da2480cc2a1e499a5c7f180?amp

radical departure from Australia's traditional exercise of its defence independence. Whether such people are even available, and whether Australia is willing or able to exercise both sovereignty and agency over vessels that are so dependent on foreign support, are make-or-break questions.

THE HIGH-RISK OPTIONS: AN ALTERNATIVE

The Australian government may need to exercise more imagination than its military advisers, because there is a third nuclear-propelled option: the French Barracuda. The planning and political fiasco surrounding the cancellation of the Attack-class boats notwithstanding, France's President Emmanuel Macron has left the French option on the table.[40] With a displacement of around 5,000 tonnes and a crew of 60, the Barracuda is comparable with the Collins-class, and with a reactor fuelled by Low Enriched Uranium it avoids the nuclear safeguarding issues of the Virginia and Astute classes, both of which are subject International Atomic Energy Agency (IAEA) safeguards to prevent diversion of nuclear materials. France's modular construction of its Barracuda-class would also align with Australia's preference for domestic construction.

Governments never dine on humble pie, even if the chef that prepared it was sacked at the last election. And if the gossip circulating around Canberra's defence circles about a USN veto on weapons-systems cooperation with France is to be believed the arguments in favour of a French acquisition, put succinctly by Alan Kuperman in mid-2022,[41] may face serious US opposition. If such rumours are true, it would do Australia well to remember that bilateral alliances cut both ways. The price that the US might need to pay for Australia's strategic support (and at this point, it might be argued that the US needs Australia as much as Australia needs the US) could well be that it should grit its teeth and swallow hard.

THE LOWER-RISK OPTION

Whether Australia is caught between a dream or a nightmare, there remains a way out: a conventionally-powered submarine that acts as both a pathway to an essential strategic capability in the short-term and to a nuclear-propelled submarine in the longer-term—if the latter offers the best long-term solution to Australia's unique needs. It is nothing short of a planning disgrace that Australia has lost almost two decades in deciding how to develop and replace a critical strategic capability. Had the Rudd and Gillard governments determined a

[40] Leali and Caulcutt (2022) "Macron says submarine offer to Australia still 'on the table'", Politico, https://www.politico.eu/article/emmanuel-macron-says-france-submarine-offer-to-australia-still-on-the-table/

[41] Kuperman (2022) "France can help Albanese fix AUKUS", *The Interpreter*, The Lowy Institute, https://www.lowyinstitute.org/the-interpreter/france-can-help-albanese-fix-aukus

way forward, a quiet conventional submarine based on the Collins design would almost certainly be undergoing sea trials right now, if it were not already in service.

For all the misinformation that attended claims that the Collins-class submarine was noisier than "a rock band under water"[42], the Australian-built submarine ultimately proved itself to be at the leading edge of conventional submarine development. In their remarkable 2008 book on the Collins story, Derek Woolner and Peter Yule demonstrate that it is possible to make a silk purse out of a sow's ear.[43] Notwithstanding a project cost that more than doubled during construction, and systems management issues that reflected the RAN's lack of familiarity with the responsibilities and obligations that accompany the status of "parent navy", the Collins-class turned out to be a capability worth the risk. And had it been seen as the capability and industry base for an ongoing conventional submarine design and construction program (as has been the case in Germany and Sweden), Australia would now be well advanced in operating an underwater system purpose designed to meet its strategic needs.

Even a slender acquaintance with economic history reinforces the fact that a strong and diverse national industrial base is an essential prerequisite for advanced industrial and defence technologies. The US, UK, France, China and Russia – the only current operators of home-grown nuclear submarines – all boast heavy industries that reach back to the beginnings of the Industrial Revolution. Dealing with the interface between heavy industry and technological innovation is in their industrial DNA and, more importantly, their national economic cultures. The other submarine builders – Brazil (in association with France), Germany, India, Iran, Italy, Japan, South Korea, Spain, Sweden, Spain, the Netherlands and Turkey (in association with Germany) – also have the industrial capacity and experience to support the construction of advanced defence systems.

Australia has nowhere near the industrial capacity of most of its G20 peers, with the possible exception of Argentina and Brazil. Indeed, in the two decades since the final Collins-class submarine was delivered, both technical know-how and industry skills in Australia have declined.

While a decision to build a home-grown boat would not entail a standing start, there is no doubt that a reset would be risky and difficult. But it would not be nearly as risky as embarking *de novo* on a nuclear-powered design with which the RAN has no operational familiarity and Australian industry no construction experience. As Kym Bergmann pointed

[42] Toohey (1998) "Big trouble with Beazley's big toys", *The Australian Financial Review*, https://www.afr.com/companies/manufacturing/big-trouble-with-beazleys-big-toys-19981212-k8hu6

[43] Yule and Woolner (2008) *The Collins Class Submarine Story: Steel, Spies and Spin*, Cambridge University Press

out recently, there are several different avenues to the re-establishment of an enduring domestic submarine industry.[44] But we do need to learn to walk again before we can run.

As was noted earlier in this paper, the question facing Australia's defence planners is ultimately one of agency: do we make our own decisions in our own interests, or do we cede responsibility for critical decisions to another state? Sovereignty is never absolute, even for exceptional powers like the US. But the ability to make independent decisions in the national interest is the ultimate responsibility of all governments, not least of all governments that are as deeply invested in regional prosperity, stability and security as Australia.

To have any effect, hope must always be grounded in common sense, experience and practicality.

[44] Bergmann (2023) "Australia's contribution to AUKUS should be a next-generation conventional submarine", *Asia-Pacific Defence Reporter*, https://asiapacificdefencereporter.com/australias-contribution-to-aukus-should-be-a-next-generation-conventional-submarine/