

Hedging our bets:

A potential Japanese option for managing risk in the AUKUS Optimal Pathway

REPORT

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Australia needs to begin planning now for options to hedge against the risk of a serious capability gap emerging in the 2030s due to any significant delay in the Collins-class life-of-type extension, the delivery of US Virginia-class submarines, and the design, construction and delivery to the RAN of SSN-AUKUS-class submarines. One possibility is to explore options for leasing an interim capability—and Japan offers a potential solution.

Executive summary

Australia's 'Optimal Pathway' to acquiring and maintaining a nuclear-propelled, conventionally armed submarine capability from the 2030s and beyond has been agreed by all three AUKUS nations and is a matter of public record.¹ This paper is supportive of pursuing that path. To be clear: AUKUS represents the best opportunity for Australia to acquire an essential strategic capability underpinning its future defence. However, the Optimal Pathway has significant cumulative risk involved. There are three major complex enterprises that must all align if Australia is not to experience a serious gap in its sovereign submarine capability in following this path. Those are the Collins-class life-of-type extension (LOTE), the transfer of three or more Virginia-class nuclear attack submarines (SSNs) from the US, and Australia's construction—with UK and US assistance—of the SSN-AUKUS, which is to be a new class of SSN submarines for the Royal Australian Navy (RAN).

Australia's defence plans require a sovereign submarine capability to be effective. 'Sovereign' in this sense means under Australia's national control. The potential capability gap that we're describing as a risk is—in terms of submarine acquisition—an awkward one. It could emerge suddenly. It's probably too long a period for Australia to run the risk of being without an essential capability, but it isn't a long time to acquire and operate a new class of submarine.

To assist in managing these three areas of separate but compounding significant risk, Australia should explore the backup option of leasing or otherwise rapidly acquiring small numbers of an advanced conventional submarine capability from Japan. Japan has a comparatively large, 'young', highly capable conventional submarine fleet. It has two active production lines that together turn out an advanced submarine each year and have the potential to ramp up production even further. It's also one of Australia's few international partners with the depth of trust and a similar view of the international security situation necessary to make this option a viable one.

Noting that AUKUS is the primary initiative for the US, the UK and Australia to work together to help deter China and for Australia to acquire a nuclear-powered submarine capability, the first part of this paper sets out the three main risks to AUKUS success. The second part then highlights how Japan could help to provide the best risk-mitigation strategy, not as an alternative but as a viable option should it be needed.

Recommendations

Australia should:

- continue its investment in the AUKUS Optimal Pathway as the best option to acquire this critical military capability
- acknowledge that, notwithstanding the benefits of AUKUS for all three nations and the extensive risk mitigation that is taking place, three significant risks still exist to the delivery of that pathway, from the current Collins-class life-of-type extension, to the delivery of the US Virginia-class submarines, to the building and delivery of the SSN-AUKUS-class submarines
- in relation to the Collins-class LOTE, note that, due to the age and condition of the boats, it may not be possible to upgrade all of them, and so it might be judged at some point well into the schedule that the entire LOTE enterprise no longer represents value for money
- in relation to the Virginia-class transfer, note that while significant focus has been on US domestic industrial capacity, the unknown state of the global security environment in the early 2030s means a known risk of a postponement of the transfer even if the AUKUS enterprise remains fully supported
- in relation to the SSN-AUKUS-class, note that delays are common to many major defence projects and Australia has never constructed nor managed a nuclear-powered program, so schedule slippage is not guaranteed but a known risk
- be aware that these risks create the potential for a submarine capability gap which could emerge suddenly
- note that, welcome as it will be, allied submarines operating through Submarine Rotational Force-West will not replace a submarine capability under Australian government control
- begin planning now for options to hedge against the risk of a serious capability gap emerging in the 2030s due to the three significant risks (Collins-class LOTE; Virginia-class submarines; SSN-AUKUS)
- explore as a matter of urgency the risk mitigation option of leasing or otherwise rapidly acquiring small numbers of advanced conventional submarines from Japan.

Part 1: Three main risks to a sovereign submarine capability in the 2030s

Two of the three enterprises that mark the Optimal Pathway—the Collins LOTE and the transfer of the Virginia-class—contain risks that could emerge rapidly.

The risks to the Collins-class LOTE are already well defined. Due to the age and condition of the boats, it may not be possible to upgrade all of them, and so it might be judged at some point well into the schedule that the entire LOTE enterprise no longer represents value for money in terms of the capability delivered. The LOTE is scheduled to begin this year (2026), so those risks could be among the first to emerge.

The second main source of risk is that, under Phase 2 of the AUKUS Optimal Pathway, the US is to transfer three or more Virginia-class nuclear-propelled submarines to Australia from the US in the early 2030s.² Yet there are known risks of a significant delay in their delivery, or—potentially—their non-delivery. Those risks revolve around the US production rate for the submarines (currently behind schedule) combined with a future US administration and US Congress judging that they have insufficient such boats for their own security, especially with regard to the Indo-Pacific. Even if there weren't known pressures militating against their delivery, the Virginia-class submarine delivery would still be the central risk to manage, as without it Australia will be forced to rely on six or less of its LOTE Collins-class submarines for the entirety of the 2030s. There's no government-endorsed alternative to the failure of either enterprise.

The third source of risk is more conventional, in that Australia has more ability to control it, but is still substantial: a significant delay in the construction and delivery of the new SSN-AUKUS class. Any such delay would be most significant for the compounding effect it would have on any gap for Australia of a modern sovereign submarine capability resulting from the non-delivery of the Virginia-class boats, combined with the sole reliance on the remaining Collins class. There's a realistic prospect for such a delay with the first of the SSN-AUKUS boats for Australia. There are known risks inherent in the design and construction of a new class of nuclear-propelled submarines. Those risks are magnified when one considers that Australia will be constructing nuclear-powered boats for the first time. Australia will be doing so based on a design from an experienced manufacturer (the UK) with substantial engineering and technical inputs from both the UK and the US (for example, the naval reactors from the UK). Further, the UK has been building SSNs for decades, and its own strategic planning requires the construction and delivery of a new class of SSNs from the late 2030s onwards. Still, it isn't unreasonable to point out that, even with such risk mitigation, delays are possible.

The parties to AUKUS Pillar 1 are aware of the three risks described above and where possible have built in some risk mitigation—for example, Submarine Rotation Force – West (SRF-W), the rotation

of US and UK nuclear attack submarines through HMAS Stirling in Western Australia. But it's impossible to fully mitigate all the risks involved to prevent a potential 10-year-plus gap in Australia's sovereign submarine capability, and SRF-W isn't intended as a substitute.

SRF-W isn't a sovereign Australian submarine capability

The primary purpose of SRF-W is to support Australia's acquiring, owning, operating (and in the case of our SSN-AUKUS submarines, constructing) SSNs. The ancillary benefits for all parties are substantial. Starting in 2027, US Navy and Royal Navy submarines will conduct extended rotations from HMAS Stirling. As part of the steady build-up to that state, US and UK submarines are visiting and undertaking increasingly complex maintenance. HMS *Anson*, a UK Astute-class SSN, arrived at HMAS Stirling just south of Perth in late February 2026 to undertake a one-month submarine maintenance program, like that undertaken by USS *Vermont*, a Virginia-class SSN, in November last year.

With both US Virginia-class and UK Astute-class boats operating from Stirling, Australia gains operating and maintenance expertise in one class of vessel that we intend to own and operate in the early-to-mid-2030s (the Virginia class) and in another (the Astute class) that will form the basis of the design of what's Australia's ultimate AUKUS goal into the 2040s and well beyond—the SSN-AUKUS. Australians and Brits are already serving on US SSNs (in the UK's case, for many years), but when SRF-W is fully operational Australian sailors will deploy in ever-increasing numbers on US and UK boats to develop practical at-sea experience on nuclear submarines, and allied and Australian personnel will continue to develop the maintenance and support capabilities ashore. This is designed to lower the overall risk in the Optimal Pathway and to build and demonstrate to our AUKUS partners the abilities of 'sovereign readiness'—that is, that we're technically capable of safely owning and operating nuclear submarines by ourselves, without becoming an undue alliance burden.

For their part, the US and the UK get access to increasingly significant maintenance at a strategic location, allowing for the forward rotation of crews and the ability to conduct regular and eventually deeper maintenance without having to make lengthy transits to home ports—all increasing the time their subs can spend on patrol in the region. One perhaps understated additional benefit for the US and UK is that, as they mature, HMAS Stirling and the shipyards nearby at Henderson will be among the most modern SSN-capable facilities available to the allies.

But the stated main purpose of the SRF-W is to increase Australia's skill base and experience with nuclear-propelled submarines,

to ‘build the necessary operational capabilities’ and ‘accelerate our efforts to develop Australia’s capability to safely and securely operate and sustain its future nuclear-powered submarines.’³ It isn’t to substitute for an Australian submarine capability under Australian Government control.

The presence of allied submarines operating from Australia might offer a measure of strategic comfort. It’s always preferable to have such an allied capability available (in theory), given the central role submarines play in Australia’s concept of maritime defence. And there are reassuring historical echoes from a time when Australia last faced an existential threat without a sovereign submarine capability, during World War II.⁴ A historic illustration of the potential utility of SRF-W isn’t literally or figuratively far away—in World War II, between 1942 and 1945, US, UK and Dutch submarines operating out of Fremantle Harbour sank over 1.5 million tons of enemy shipping, directly contributing to shortening the war in the Pacific.

But, while the mutual benefits are clear for Australia and its allies, there’s no suggestion that SRF-W is intended to—or could—replace a sovereign submarine capability for Australia. Australia has explicitly rejected the idea of allied ships simply operating out of Australia. Responding specifically to such a suggestion, Australia’s then Chief of the Defence Force, Admiral Johnston, said: ‘That firmly remains our objective — to have an Australian national capability that brings all of the extraordinary capacity that a nuclear submarine brings, but having one that is under our national control.’⁵ Even if it were agreed that US and UK submarines would operate out of Australia in return for some measure of protection (and that’s not the stated agreement), it should be clear that any benefits would be significantly less than those gained from controlling one’s own capability. For their part, the US and UK haven’t given any indication that their SSNs would in any way operate other than under their own sovereign control. Indeed, based on previous public comments by current senior US officials,⁶ any divergence in strategic or operational priorities for US SSNs would very likely see US interests take priority—a completely unsurprising conclusion. SRF-W, therefore, while a prudent and mutually beneficial approach to ensuring Australia can operate and maintain its own SSNs, isn’t a substitute for a modern, sovereign submarine capability.

Risk profile 1: the Collins-class LOTE

The current main method of ensuring that Australia possesses at least some crewed submarine capability under national control during the 2030s is via an extension of Australia’s existing submarine capability—the Collins-class LOTE. The intent behind this A\$4–5 billion program is to extend the life of (if possible) all six Collins-class submarines by 10 years from their original scheduled life of type—28 years. The first of type (HMAS *Collins*) was due to retire in 2024, with the others to follow. The LOTE program itself is planned to stretch from this year (2026) to the mid-2030s. The total cost of the Collins LOTE is budgeted in the 2024 Integrated Investment Program budget for A\$4–5 billion,⁷

although the Australian Submarine Agency quotes a LOTE figure of A\$4.3–6.4 billion.⁸ By way of comparison, a new, modern conventional submarine, such as Japan’s Taigei-class, costs approximately A\$600–700 million.⁹

The LOTE will be challenging in terms of engineering and schedule and expensive relative to the capability delivered even if it proves possible. A large part of the uncertainty revolves around the physical condition of the submarines. They’re older boats by modern submarine standards and may have damage such as corrosion or fatigue that isn’t able to be fully assessed until the boat is already undergoing deep maintenance. Thus, the final decision as to whether an individual boat is too damaged to be worth subjecting to a full LOTE can’t be made until the process is underway.

It may well be that, upon a deeper examination, one or more individual submarines might be found to not be worth undergoing a full LOTE.¹⁰ For example, in 2024, two boats (HMAS *Sheean* and HMAS *Farncomb*) were found to have unanticipated levels of corrosion in certain parts of the vessels.¹¹ Corrosion itself isn’t unexpected in submarines undergoing maintenance, but for the purposes of deciding whether to undergo a full (and expensive) extension it’s possible that in older vessels like the Collins-class unexpected levels of damage could be discovered that make a full LOTE uneconomical.

Another factor affecting the scope of the overall LOTE is that there are very specific windows for each submarine in which the LOTE works must be completed, during the scheduled full cycle docking (FCD). These are part of the regular maintenance schedule of the submarines, and each FCD takes two years, every 10 years. The LOTE works must take place within that two-year window or risk a cascading series of impacts on the availability, timing and capability of the entire class of submarines. There are already significant risks with what can be accomplished in the FCD window, and reports are emerging that the first scheduled vessel in the LOTE program, HMAS *Farncomb*, might not be subject to a full LOTE as planned, with its main motor, diesel engines and generators possibly not being replaced.¹²

It’s worth noting here that if the LOTE for this boat or others is de-scoped then there will be distinct levels of capability within the single class.¹³ Presumably, the de-scoped boats will have a much shorter life span remaining (that is, not the full 10 years provided by an extension) and/or possibly a reduced capability compared to the ‘full-LOTE’ boats (they may be less quiet or have less endurance, for example). If that’s the case, they would be the most obvious candidates for early retirement, and they wouldn’t be the first choice for the most challenging missions for the remaining Collins class.

Whatever the capability that’s ultimately delivered and however many in the 2030s, even six fully upgraded LOTE boats will be increasingly less capable compared with newer additions to regional fleets.¹⁴ Regional powers are rapidly increasing the numbers and quality of their submarine fleets. As competing nations develop and acquire increasing familiarity with their own

new classes of submarines, the technical threat they might pose to Australian vessels increases over time. The result will be an increasingly dangerous environment in which our older submarines must operate—over time resulting in either restricting the types of missions they can conduct or accepting increasing levels of risk to the vessels and their crews. Even without the threat posed by a potential adversary, the RAN will have to accept an increasing baseline operational risk, especially with any non-LOTE boats—operating submarines even in peacetime comes with a certain level of risk.¹⁵ At its most extreme, a total reliance on the LOTE boats could well see the effective loss of a modern sovereign submarine capability for Australia.

Risk profile 2: Virginia-class numbers

There's a reason Australia is seeking to acquire the Virginia-class submarine under the Optimal Pathway—it's a very highly capable SSN, and among the best or arguably the best in the world. It's at present the best submarine capability available (in theory) to meet Australia's strategic requirement for a quiet, long-endurance, fast submarine capability able to undertake the full suite of required missions.¹⁶ The capability gap in the 2030s discussed above is explicitly referenced in Australian Government documents as the rationale for the acquisition of the Virginia class.¹⁷ If delivered in sufficient time (early in the 2030s) and numbers (at least three) the principal risk described in this paper—the absence of a modern sovereign submarine capability for Australia in the 2030s—largely falls away or is totally mitigated. That is, even with three boats, supplemented by the remaining Collins class, Australia would have a credible minimum sovereign submarine capability, greatly enhancing its military deterrence. The Australian Virginias would be capable of undertaking the most challenging missions, presenting potential adversaries with a significant threat and complicating their planning considerably in almost all scenarios. The less-capable remaining Collins boats would be able to undertake less-challenging missions in peacetime, spending less time in the most taxing environments (such as long-range, long-duration missions), but still be available *in extremis* to undertake missions to Australia's near north, possibly in conjunction with a growing underwater autonomous vehicle capability.¹⁸

In terms of the rationale for the numbers of Virginias that Australia is seeking as a minimum capability, three boats is generally considered a minimal viable capability. The rough capability rule is that 'three gets you one': in the case of submarines, at any given time one boat is likely to be in deep maintenance, one in temporary or regular maintenance and one boat on patrol or available for operations. The Optimal Pathway agreement with the US allows for up to five, the larger number granting more redundancy and operational flexibility (although also bringing greater requirements for crewing and expense in general). It would also allow for the more rapid retirement of the remaining Collins class.

The issue of the timing of the delivery of the Virginias is therefore critical for Australia maintaining a modern sovereign submarine

capability. The Optimal Pathway lays out 'the early 2030s' as the target for the transfer of the first such boat.¹⁹ The US Congress has passed legislation—the AUKUS Submarine Transfer Authorisation Act, passed into law in 2023—that requires that the President must certify to congress no later than 270 days before any transfer that the transfer won't harm US interests, before the transfer can proceed, notwithstanding the agreement reached to date.²⁰ The transfer date window was originally decided upon by a combination of the end of the Collins-class life-of-type from 2024 (and subsequent LOTE decision), the likely ability of Australia to achieve sovereign readiness by that time, and estimates of the ability of the US's industrial capacity to expand to lift the production rate of its nuclear vessels, in the context of the likely US requirements weighed against the security environment.²¹

This is the central source of risk in the most critical part of the Optimal Pathway. In the case of the Virginia-class production line, we're already seeing the outline of challenges that would result in a delay to the delivery of those subs to Australia. There's been a recognition of the need for an increase in an already operating production line from (at the time of writing) an average of 1.2 boats per year to 2 per year by 2028, growing to 2.33 per year, to build sufficient replacement boats for the US Navy to allow the three to five boats to be transferred to Australia.²² This is based on the US Navy's assessed requirement for sufficient submarines to meet contingencies primarily in the Indo-Pacific, among others. In recognition of this challenge, a core feature of the early steps along the Optimal Pathway is for Australia to invest directly in expanding the US's industrial capacity to increase the rate of production of boats—and Australia has delivered at least A\$1.6 billion in two instalments at the time of writing (the third, due by the end of 2025, has not yet been publicly confirmed), with around A\$4.6 billion over 10 years planned (US\$2 billion by the end of 2025, the remaining US\$1 billion over the next 10 years; total US\$3 billion).

However, the Virginia-class SSN program is currently facing significant production delays. Due to setbacks engendered by the Covid-19 pandemic stressing the supply chains and skilled workforce of an already sluggish nuclear submarine construction program, the prioritisation of the construction of the Columbia-class nuclear-missile boats, and the increased size and complexity of the new 'Block V' variant, some individual boats are running 24 to 36 months behind schedule. USS *Iowa* (SSN-795) was delivered approximately 40 months late. As of March 2026, the program as a whole is estimated to be roughly 41 months behind its original targets.²³ Following the use of the US Defense Production Act and an emergency investment program planned to approach US\$20 billion by 2029, expectations are for a return to a steady production cadence only by 2028, by which time it's hoped they can return to producing two boats per year.²⁴

At the same time, the US is retiring its older Los Angeles-class SSNs at a rate that's outpacing the delivery of the Virginias. Even with mitigation plans, the projected result is a drop in US SSNs to 47 by 2030, rising to 50 by 2032 before reaching the US Navy's stated required level of 66 boats by around 2052.²⁵ Those numbers don't include a reduction of three to five boats resulting from a transfer

to Australia under AUKUS. If the submarines are to be released to Australia by 2032, the US administration will probably make the determination (that it must do by law no later than 270 days before any transfer) to the US Congress in the same year (2030) that US SSN numbers are projected to reach their lowest point, some 19 boats fewer than the previously assessed requirement.

So, the delay in the planned increase in production puts extra focus on the probable 2030 or 2031 decision point to proceed with the transfer of the Virginia-class boats to Australia (the decision-maker is the US President). If the President of the day decides at that point that the risk to US planning in the Indo-Pacific or any other theatre is too great, they may delay or indefinitely defer the delivery. It's true that the declining numbers of SSNs projected to be available to the US Navy have been known since at least 1995, but the US has also recognised a steadily deteriorating security environment since then, with an increasing rapidity in recent years. The assessed advantages that the US maintains in submarine warfare are especially pertinent to security contingencies in the Indo-Pacific, including those arising from Taiwan or the South China Sea.

The current US administration is presently supportive of AUKUS Pillar 1 arrangements, following an internal Pentagon review, but only after public comments by senior administration officials that crystallised US concerns about the transfer. Elbridge Colby, US Under Secretary of War for Policy at the Pentagon—in comments shortly before his appointment to that position—specifically questioned the rationale for the proposed transfer. He stated:

Pillar I is very problematic ... we have way too few attack submarines for what we need as a nation. How are we supposed to give away nuclear attack submarines in the years of the window of potential conflict with China? A nuclear attack submarine is the most important asset for a western Pacific fight, for Taiwan, conventionally. But we don't have enough, and we're not going to have enough.²⁶

Significantly, Colby was the primary author of the Pentagon review and would have had access to classified information and other inputs that he did not when making his earlier comments. The mutually beneficial and transactional nature of the agreement, involving not a 'give away' but an acquisition, is also known to provide confidence to all three nations that the partnership will remain on foot. Of course, the view of any administration can be subject to change, depending on changing political imperatives and strategic circumstances. And the fact that the review into AUKUS was instigated shows that each administration will decide whether it's to be bound by the agreements of previous administrations in this space, given its perceived centrality to US national security. Lastly, the inherent unpredictability of the international security environment in three or four years—the likely first decision point—given the current rapidly deteriorating security situation, weighs heavily on the risk that the US may decide that the risk of transferring SSNs to even a trusted ally is too great. Such an outcome is more likely to initially involve a temporary decision that postpones transfer rather than a permanent termination, but that would still mean a gap in Australian capability.

Risk profile 3: SSN-AUKUS

Should the US decide to delay or indefinitely defer the transfer of the Virginia-class boats to Australia, the question of when the resulting gap could be closed by the delivery of the new SSN-AUKUS class comes into sharper focus. The current plan is for the RAN to take delivery of the first such boat in 2040, after its construction in Australia in the 2030s. Any delay to this timeline would result in an extension of any capability gap created by the absence of the Virginias. The Optimal Pathway requires Australia to construct its SSN-AUKUS boats in Australia (integrating technology from the US and the UK, including the naval reactors from the latter).

Australia has begun making substantial investments in its own industrial capacity. As well as the investments in facilities in Western Australia in the form of HMAS Stirling and the shipyards at Henderson, and the direct investment in both US and UK SSN industrial capacity, the government has announced A\$3.9 billion to begin construction of the SSN-AUKUS design build shipyards at Osborne in South Australia, out of an estimated total of A\$30 billion to be spent there.²⁷ It has also ordered the first components of the future submarines from the UK, making a A\$310 million payment for the acquisition of long-lead items, including the nuclear propulsion systems of Australia's first two SSN-AUKUS boats.²⁸ Significant investment is also being made in recognition of the need to begin now to develop the necessary workforce to conduct the engineering and construction of what will arguably be Australia's most complex industrial endeavour.

Nonetheless, all costs and schedule estimates for the Australian-built SSN-AUKUS boats have even more uncertainty and contingency than most large, complex engineering projects for the simple reason that Australia has never built any SSNs before now. Cost overruns and even more importantly schedule slippage are of course not guaranteed, but if they were to occur they would be unremarkable in such a novel, long-term, complex, technically challenging, large-scale engineering project. Even with this very large outlay of national resources, the timely construction of these vessels will be an enormous challenge for Australia. Should delays occur to their delivery in the absence of the Virginia class and with a reduced, increasingly technologically obsolete remnant Collins fleet, Australia would face what's increasingly likely to be a challenging regional security environment without a modern sovereign submarine capability. In such circumstances, it seems logical to investigate ways to reduce risk.

This substantial investment across all facets of the Optimal Pathway is necessary to ensure that Australia is ready to initially safely and effectively own and operate from three to five SSNs and in the medium to long term build, own and operate six SSN-AUKUS vessels. Each investment at this stage is an attempt to reduce future risk. Given the very large sums involved (by its conclusion, developing such a capability will have consumed a significant fraction of Australia's GDP), it seems prudent that Australia should explore every opportunity to further reduce risk. Leasing a modern capability, should the need arise, represents such an opportunity.

Part 2: Mitigating risks to the Optimal Pathway

Advantages of a leased capability

Should it become necessary due to the risks explored above manifesting at short notice, leasing or otherwise rapidly acquiring a submarine capability of a small number of boats for a relatively short time would avoid most of the risk of a decade-long gap in submarine capability. It would be much faster to implement than the usually arduous undertaking of selecting and negotiating a full, time-consuming acquisition process for a fleet of submarines, especially if prior preparation to enable such an option had already taken place. Even if the Australian Government of the day didn't insist on building some or all of the new submarines in Australia, added requirements to the design (or insisted on a completely new design), or both, an 'off-the-shelf' purchase would normally require joining the queue for the production of new submarines. This could mean in practical terms that it would be many years before the first such boats would be in service with the RAN from the date of a decision to procure them, unless Australia could somehow 'jump the queue'.

The likely gap we're describing as a risk is, in terms of submarine acquisition, an awkward one. It could emerge suddenly. It's probably too long a period for Australia to run the risk of being without an essential capability, but it isn't a long time to acquire and operate a new class of submarines. With the advent of the SSN-AUKUS class scheduled for the end of the decade, it might not represent value for money to fully acquire a new class of conventional submarines that would arrive not long before the SSN-AUKUS boats are in service. In such a scenario, a government left with no options following the non-arrival of sufficient Virginia-class submarines might decide that Australia must endure a critical capability gap in our defence. However, in such an event, a leasing option could be implemented quickly, especially if prior agreement had been reached in principle with a reliable partner.

In a leasing scenario, Australia wouldn't be responsible for all the costs of owning a class of submarines over their usually very long operational life—from designing and building, through trials and introduction into service, through-life deep maintenance, any LOTE and ultimately to decommissioning. The economies are therefore also different, and Australia wouldn't be required to either make a large order for conventional submarines to reduce the unit cost (thus extending the time it would be operating such submarines by many years) or purchase only a few vessels as a minimum viable capability and thus greatly increase the likely unit cost, to make it profitable for the manufacturer. In the case of any lease, in principle a great deal of overheads and cost are avoided for the lessee, while the lessor potentially gets some continued use of the asset for whatever purpose before and after the lease is concluded. As with any leasing arrangement, there are trade-offs for the flexibility it offers, but it's that flexibility that makes leasing such a capability attractive in the circumstances we're describing.

While not necessarily the first choice for Australian defence planners, there's ample precedent in Australia's history for leasing (sometimes under the rubric of 'cost sharing') capability. There have been many situations in which its flexibility has represented the best option. Australia has not only leased naval capabilities before, but it does so now—MV *Sycamore* and MV *Mercator* are leased from commercial suppliers by the RAN for training purposes. HMAS *Jervis Bay* was (very briefly) leased before it was rapidly acquired to fill a naval transport capability gap highlighted by the Australian-led intervention in East Timor in 1999. A relevant example is the 'loan and cost-sharing arrangements' for the Royal Navy's Oberon-class submarines during the establishment of HMAS *Platypus* as the training and operational base for Australia's own Oberon boats. HMS *Odin*, an Oberon-class submarine,²⁹ was 'loaned' under a cost-sharing and crewing arrangement to cover a capability gap created during delays to the refit of HMAS *Oxley* (an RAN Oberon-class submarine)—a delay caused due to it being the first time an Australian shipyard had undertaken an extensive refit of that class of submarine.

A contemporary example is provided by the leasing arrangement between the Indian Navy and Russia³⁰—India leases Russian SSNs to fill a capability gap and to further develop its indigenous capability. India has in fact taken this route three times: once during the Cold War when it leased a nuclear submarine from the Soviet Union between 1988 and 1991; again in 2012; and most recently in 2019, when it leased Akula-class nuclear-powered SSNs from Russia,³¹ the lease being for 10 years on each occasion. India regards those leases as a necessary but flexible and cost-effective stopgap to bridge a critical capability gap, given its strategic circumstances.

If the flexibility and potential suitability of a leasing arrangement might suit Australia's circumstances, the question arises: lease the submarines from whom? While on paper there are many potential candidates, in reality the number is a much smaller one. First, who has an active submarine production pipeline that would enable the rapid acquisition of a modern, capable submarine in the time frame we're considering—the early 2030s, with a decision required possibly as soon as 2030? A second factor is who would realistically be trusted and willing to enter such an arrangement with Australia. A third and arguably the most important criterion is that they would need to be able to transfer sufficient numbers in a relatively short time frame without compromising their own security.

There are a significant number of submarine capabilities that might be available to Australia to lease under such circumstances, but applying the criteria above reduces the list. The types of modern capability Australia might be seeking for the period of a potential submarine capability gap can be illustrated by the current short-listing process for the Canadian Patrol Submarine Project (CPSP). By looking at Australia's own relatively recent short-listing process for the Attack-class / Shortfin Barracuda and Canada's

ongoing CPSP acquisition process, we can get a reasonable idea of the types of capability Australia would seek.

Canada’s candidates were a mix of in-service/in-production advanced conventional submarines and boats reportedly on the verge of production. The contenders were the C71 Expeditionary from Sweden’s Saab, the Orka class from France’s Naval Group, the KSS-III from South Korea’s Hanwha Ocean, the S-80 Plus from Spain’s Navantia, the Taigei class from Japan’s Mitsubishi Heavy Industries and the Type 212CD from Thyssenkrupp Marine Systems, jointly developed by Germany and Norway. In August 2025, the Canadian Government short-listed the Type 212CD and KSS-III.

This is a fair survey of the types of capabilities available in the relevant time frame and the result of an acquisition selection process roughly similar to that typically conducted by Australia. Similar geopolitical and alliance factors would be in play, for example. Indeed, South Korean designs, especially the Dosan Ahn Changho-class (KSS-III Batch II) submarines have been proposed³² in terms of a potential replacement for AUKUS—but not under a leasing arrangement; that is, they’ve been suggested for a full acquisition instead of the Virginia-class. While South Korea has formidable manufacturing capability and capacity, it probably doesn’t have sufficient numbers of existing or projected modern submarines that would enable a rapid acquisition or leasing. There are other submarine types and manufacturers that could be added to the list, but they’re few in number and none meets the central criteria for our purposes of availability of modern boats in sufficient numbers in a short time frame. Applying all three criteria above arguably reduces the number of suitable countries to one: Japan.

The case for Japan

Several factors put Japan at the forefront when considering potential sources to mitigate any Australian submarine capability gap. Due to a combination of a prudent industrial manufacturing policy with likely spare submarine production capacity, advanced R&D with continuous, incremental introduction of technologies, and effectively a ‘surge’ capacity, Japan possesses a large, modern, technologically advanced submarine fleet with, potentially, capacity to spare.

For almost 50 years, Japan has pursued a remarkably consistent submarine production schedule with an unusual feature: it contracts two different companies, Mitsubishi Heavy Industries (MHI) and Kawasaki Heavy Industries (KHI), to each produce the same submarine design every two years.³³ This production schedule is alternating, meaning that since 1980 (with very little disruption) Japan has had a new submarine delivered to the Japan Self-Defense Forces (JSDF) each year. This has several benefits for sustaining Japanese industry, such as preserving a stable, skilled workforce, ensuring redundancy in production capacity and avoiding the ‘valley of death’ for manufacturers that results from too long a period between orders.

Having two active production lines also means that Japan has some capacity to expand existing production capacity quickly, if necessary. It did so in November 2025, providing additional money

so that Japanese industry could bring forward the production of submarines and frigates.³⁴ It also means Japan for the last several decades has possessed a very ‘young’ (in terms of hull life) and relatively large submarine fleet. Incremental improvements and the steady introduction of new technology as the fleet is built, as well as regularly introducing entirely new classes of vessel, mean that the fleet as a whole is able to better pace the threat from potential adversaries, remaining highly capable and operationally available.³⁵

Japan has had a policy of shaping its submarine fleet to ensure that it possesses an ample, modern fleet for a wartime contingency, by both its continuous production policy and by simultaneously decommissioning its submarines after around 20 years—with probably up to 15–20 years of potential operational life remaining.³⁶ That’s far sooner than for most other navies. It avoids the need for mid-life upgrades and means that even its current ‘older’ boats aren’t that old in terms of their remaining potential hull life. Japan is thus in a nearly unique position of having a relatively large number of modern submarines available. For Japan, this acts as a form of insurance, along with the ability (with sufficient warning) to be able to surge its submarine numbers further to meet any threat.

The Japan Maritime Self-Defense Force (JMSDF) currently operates a fleet of 24 diesel–electric attack submarines, including a training vessel: seven Oyashio-class, twelve Sōryū-class and five Taigei-class vessels (Table 1).

Table 1: Japanese submarines

Hull	Name	Class	Commissioned	Builder	Status
592	<i>Uzushio</i>	Oyashio	1998	MHI	Training
593	<i>Makishio</i>	Oyashio	1999	KHI	Active
594	<i>Isoshio</i>	Oyashio	2000	MHI	Active
595	<i>Narushio</i>	Oyashio	2001	KHI	Active
596	<i>Kurashio</i>	Oyashio	2002	MHI	Active
597	<i>Takashio</i>	Oyashio	2003	KHI	Active
598	<i>Yaeshio</i>	Oyashio	2004	MHI	Active
501	<i>Soryu</i>	Soryu	2009	MHI	Active
502	<i>Unryu</i>	Soryu	2010	KHI	Active
503	<i>Hakuryu</i>	Soryu	2011	MHI	Active
504	<i>Kenryu</i>	Soryu	2012	KHI	Active
505	<i>Zuiryu</i>	Soryu	2013	MHI	Active
506	<i>Kokuryu</i>	Soryu	2015	KHI	Active
507	<i>Jinryu</i>	Soryu	2016	MHI	Active
508	<i>Sekiryu</i>	Soryu	2017	KHI	Active
509	<i>Seiryu</i>	Soryu	2018	MHI	Active
510	<i>Shoryu</i>	Soryu	2019	KHI	Active
511	<i>Oryu</i>	Soryu (Li-ion)	2020	MHI	Active
512	<i>Toryu</i>	Soryu (Li-ion)	2021	KHI	Active
514	<i>Hakugei</i>	Taigei	2023	MHI	Active
515	<i>Jingei</i>	Taigei	2024	KHI	Active
516	<i>Raigei</i>	Taigei	2025	MHI	Active
517	<i>Chogei</i>	Taigei	2026	MHI	Active
518	<i>Sogei</i>	Taigei	2027 (planned)	KHI	Launched-seatrials

Source: ‘Equipment’, JMSDF, [online](#).

For a leasing arrangement to be possible for Australia in the circumstances described above (the delayed or non-delivery of the Virginia-class submarines resulting in a critical capability gap), a candidate country would have to possess sufficient submarines to make their transfer under a lease or other arrangement plausible without reducing that country's own fleet to a level that jeopardises its own security.

Submarine cooperation with Japan isn't an entirely new proposition. Australia has already taken a close look at the Soryu class during its evaluation as a short-listed candidate for the Australian Future Submarine Program and decided that it was a credible replacement for the Collins class. Ultimately, it lost to the French candidate with the selection of the Attack-class / Shortfin Barracuda, itself later cancelled by Australia in favour of AUKUS. Multiple reasons were reported for Japan losing the competition, but technical and capability reasons weren't to the fore.³⁷ Reportedly, it had been chosen by the Abbott government as the replacement, but without any domestic manufacturing consideration; that is, it was to be purchased 'off-the-shelf', and all the boats ordered were to be constructed in Japan (not Australia) under Japan's existing manufacturing system.³⁸ It was reportedly that latter domestic manufacturing consideration rather than technical issues that led to the competition being reopened.³⁹

The issue of a lack of domestic manufacturing could re-emerge as an objection to a lease or rapid acquisition. This would be, by definition, 'off-the-shelf' to a high degree, and it's unlikely that a joint Japanese-Australian manufacturing capability and production line—as envisaged under the Mogami-class frigate deal—could be established in a useful time frame, especially with the ramping up of SSN-AUKUS production by Australia in the same period. However, the urgency of the requirement might outweigh the reasonable desire to keep money and jobs in Australia if possible.

During the competition, no technical issues were publicly identified or reported as being insurmountable; the deciding factor seemed to be the domestic construction dimension, exacerbated by Japan then having limited export support experience.⁴⁰ The US was supportive of the deal and raised no objections to interoperability or the technical integration of US weapons and combat systems. It's important to note the Soryu class was almost the next choice (and for a while, reportedly *was* the choice) to replace the Collins class. As one of the final candidates, if it had been selected Australia probably would be operating one or more of them from 2030 onwards. So, while certainly not the equivalent of the Virginia class, they're certainly more advanced than even the upgraded Collins. Most importantly, they and their successor class would be modern, quiet, capable—and potentially available.

Japan has submarines that are even more capable than the Soryu that could be available to Australia. Given the window we're discussing (the early to mid-2030s), realistically the late Soryu class or early Taigei class are the submarines that might be available under a leasing arrangement with Australia. If a rapid acquisition process could be agreed, the Taigei boats are already

in production.⁴¹ Japan is already designing a follow-on class to the Taigei, and there's been reporting that it will potentially design and build its own SSN.⁴² This means Japan will continue to provide for its advanced submarine capabilities into the 2030s. Japanese SSNs, if they do emerge, are beyond the window we're discussing, but Japan's planning for future advanced submarine production means it isn't intending to be reliant on its existing or older vessels.

The Taigei class is a mature design, with the sixth vessel, *Sogeï*, launched in October 2025. As with the Soryu boats, new technology is constantly being added to the class as new boats are delivered. For example, the last three boats delivered have improved diesel engines to extend their range and allow for more rapid charging of batteries at snorkel depth, and the latest, *Sogeï*, is equipped with a new snorkel system to reduce signatures, a new sonar system based on fibre-optics and a new combat-management system. All the Taigei class are equipped with lithium-ion batteries, as is the case with the 11th and 12th submarines of the Sōryū class (*Ōryū* and *Tōryū*, the last two of that class). Japan is to date the only nation known to have fitted lithium-ion batteries to its diesel-electric submarines, although South Korea is planning to do so from 2027. Lithium-ion batteries offer several advantages for non-nuclear-propelled submarines over alternatives, such as air-independent propulsion, primarily as a result of increased energy density, including increased endurance and speed, and reduced recharge time, weight and complexity and acoustic signatures. With continual improvements in technology built into the construction process, the Taigei class is scheduled to be in production until the early 2030s with at least the same annual cadence as all Japanese submarines.

If arrangements for a rapid acquisition could be reached—for example, agreed in principle before a final decision is required—several future boats could potentially be 'reserved' off the current or an accelerated production line. The cost need not be prohibitive. If, for example, the Collins-class LOTE is unsuccessful, the current cost of a Taigei-class submarine compares favourably in terms of unit cost and is a significant improvement in terms of capability. The fifth Taigei-class boat, *Chogeï*, cost about ¥64.8 billion (or around A\$570 million) in 2024. The sixth, *Sogeï*, cost about ¥73.6 billion (A\$642 million).⁴³ The ultimate cost to Australia might be greater when the full cost to achieve operational capability, the premium for a leasing arrangement, or both, are considered, but they still compare very favourably to the average planned cost of the Collins-class LOTE even if all six are fully upgraded (approximately A\$660 million to A\$830 million each).

If Australia's leasing of submarines were to result in the substantial reduction of a close Indo-Pacific ally's submarine capability, it wouldn't be welcomed in the region by other allies, such as the US, even if it were possible. However, Japan is a viable option because it has both a potential pool of a large, advanced modern submarine fleet and a potential surge capacity to produce more and at a faster rate if necessary. It's already planning to produce future designs, including possibly its own SSNs. Leasing several of its older (but still modern and capable) boats, or the advance purchase and

'reserving' of newer boats now off a future production line, would have an impact on Japanese capability, but with sufficient notice and given its unique circumstances that's likely to be manageable—and arguably more manageable than any other option.

There are some trade-offs with leasing compared to traditional acquisition of a new design of boats, such as the lack of an opportunity for domestic manufacturing. Another disadvantage is that Australia wouldn't be able to incorporate any design changes, although, in terms of cost and timing if not capability, that might not be such a bad thing.⁴⁴

But as an *in extremis* option, from a capability perspective leased boats from Japan would be most welcome to fill any looming capability gap. They would be more than capable of effectively patrolling the straits to our near north, especially in combination with Australia's developing uncrewed underwater vehicle capability and maritime drones more broadly.⁴⁵ Under the Optimal Pathway, Australia is already planning on something similar, in terms of different classes of submarines with different mission sets.

Japan is a close partner of Australia. Australia and Japan celebrate the 50th anniversary of the Basic Treaty of Friendship and Cooperation (the NARA Treaty) in 2026. In diplomacy and

security, a common perception of the likely sources of threats in the Western Pacific over the foreseeable future has made an old and close relationship even closer. In the realm of naval capability, Australia recently decided to acquire up to 11 upgraded Mogami-class frigates built by MHI (also one of the two prime submarine manufacturers), signing the purchase agreement for the first three vessels (to be constructed in Japan) on 18 April 2026.⁴⁶ As well as demonstrating that such a large-scale naval capability acquisition after a competitive tender is possible between Japan and Australia, it also clearly shows that the RAN has no issues with either the quality of Japanese major naval platforms nor lacks confidence in the RAN's ability to integrate and operate them. It's also worth noting that, as part of the deal during the competition phase, Japan offered to 'advance' frigates off the production line for Australia ahead of the JSDF, indicating considerable goodwill as well as a keenness on the Japanese side to export the capability to Australia.⁴⁷ Asking to lease some of Japan's existing capability, albeit in the future, would mean drawing on any reservoir of goodwill. However, with appropriate and, above all, early engagement, such an agreement might be negotiated.

Conclusion

Early engagement with Japan (or with any other suitable candidate, if one could be found) to ascertain any appetite for the proposal outlined in this report is essential if it's to become a viable option. Both parties would need to engage in considerable planning to not only discuss the commercial and legal arrangements but to overcome any practical hurdles to the introduction of the later Soryu-class or the Taigei-class submarines. Issues such as crew size and composition, familiarisation with the class of vessel to maximise operational use, sustainment and integration into Australia's existing force structure all require as much lead time as possible to resolve. Such issues could be addressed with minimal resources before any final decision through such mechanisms as familiarisation visits, crew transfers and training on Japan's submarine training fleet, and so on. Given that the decision point could come by 2030, if not sooner, diplomatic and military-to-military engagement should begin as soon as possible. It might be necessary for the details and progress of the initial engagement to be relatively discreet in terms of public discourse, for expectation management by both nation's polities and to avoid a locking-in of positions.

One argument that might need to be anticipated is that exploring a viable stopgap submarine capability would somehow let the US 'off the hook' in terms of the commitments it's made to supply the Virginia-class submarines. There are a number of weaknesses with that position. The US will make a final decision on whether it can risk the transfer of the required number of Virginia-class submarines over the specified time frame based on

an assessment of the expected threat at the time. While the degree of distress that could potentially cause a close ally like Australia will undoubtedly be a factor in that decision, it's naive to assume that such stress will outweigh that threat assessment, combined with the production rate. It certainly won't prevent the US from making a core national-security decision in its own interests, all things considered. It can also not be seen as a lack of faith or commitment to the alliance—any such agreement would come into practical effect only if the US decided it was unable to meet its side of the bargain. Similarly, in such a circumstance it wouldn't affect the need for the SSN-AUKUS to be brought into service as quickly as possible. Regardless, it's likely to be seen by the US as simply prudent for Australia to make all possible provisions for Australia's own security—and conversely, possibly to be seen as overly dependent on US security guarantees not to have even attempted to do so. Australia's discussions to that effect with one of its other closest allies in the Indo-Pacific—Japan—aren't likely to perturb the US national-security establishment.

The leasing option suggested in this paper wouldn't be ideal, likely providing less capability than a nuclear submarine while adding additional expense. The smooth, on-time delivery of all three aspects of the AUKUS optimal pathway would be most effective. But it's a suggested and temporary fallback plan to be available if things go wrong. It is prudent without being reckless. If the LOTE program effectively fails, then there would be a negative impact on Australian jobs and industry—although arguably this could ease the demand posed by the parallel ramping up of SSN-AUKUS

construction. But a lease or other form of rapid acquisition would be a way to ensure that, *in extremis*, Australia possesses a modern, sovereign submarine capability for its defence.

It's important to emphasise again that this paper isn't arguing for the scrapping of the Australian Government's Optimal Pathway to acquire an Australian nuclear-propelled, conventionally armed submarine capability. Australia requires a modern submarine capability under national control to underpin its defence. Executed to plan, the Optimal Pathway not only ensures the provision of such a capability, but affords Australia a leap of capability an order of magnitude above the already substantial capability provided by its existing submarines.

However, in response to questions about how to manage the inherently high degree of risk in this pathway, the government has (at least publicly) insisted that there's no 'Plan B'. That's understandable in terms of suggestions that the risks are only managed by scrapping AUKUS and starting again.⁴⁸ This paper argues for the ongoing commitment to the existing AUKUS plan in parallel with the exploration of further risk management. In its initial stages, this exploration would cost relatively little in resources or capacity and, even in its later stages (by which time the level of risk should be emerging even more clearly), it would require relatively modest investment to ensure the acquisition of a minimum capability.

Given the depth of the request that Australia would be making of Japan, engagement needs to begin now for this option to be a realistic possibility. As well as the political and diplomatic dimensions, there would be a significant number of practical matters that would need to be put in train as soon as possible, including investigating costs and funding, industrial production, visits by crew and vessels to begin familiarisation, and so on.

The only type of submarine that can meet all of Australia's requirements is an SSN; but, in its absence and to bridge any gap that emerges as best we can until one becomes available, it's necessary to investigate alternatives to cover a major known contingency. A capable sovereign submarine capability is a core requirement for Australia's defence over the next two decades, and there are known risks that could prevent that happening. Exploring a relatively modest alternative such as leasing from Japan seems prudent—and it needs to begin now if it's to be useful in time.

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Acronyms and abbreviations

CPSP	Canadian Patrol Submarine Project
FCD	full cycle docking
GDP	gross domestic product
JMSDF	Japan Maritime Self-Defense Force
JSDF	Japan Self-Defense Forces
KHI	Kawasaki Heavy Industries
LOTE	life-of-type extension
MHI	Mitsubishi Heavy Industries
R&D	research and development
RAN	Royal Australian Navy
SRF-W	Submarine Rotation Force – West
SSN	ship, submersible, nuclear (nuclear-powered fast attack submarine)



25
YEARS
2001-2026