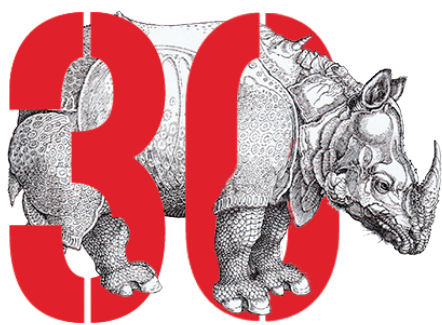


Non multa, sed multum



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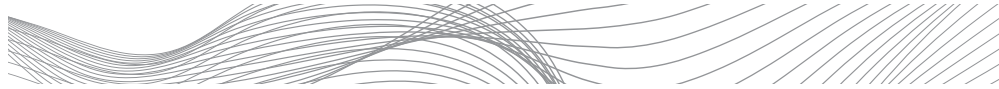
Global Edition

Vladimir Ladanov

DEALING WITH THE ROYAL AUSTRALIAN NAVY'S SSN CAPABILITY: RISK REDUCTION OPTIONS



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This research paper examines the implications of the emergence of the Royal Australian Navy's (RAN's) nuclear-powered submarine (SSN) capability for Russia's security, namely the safety of its submarine-based strategic nuclear deterrent operated by the Pacific Fleet from its base in Vilyuchinsk on the Kamchatka Peninsula. As a result of such analysis, potential risk reduction measures will be set forth to be explored with Australia in due course.

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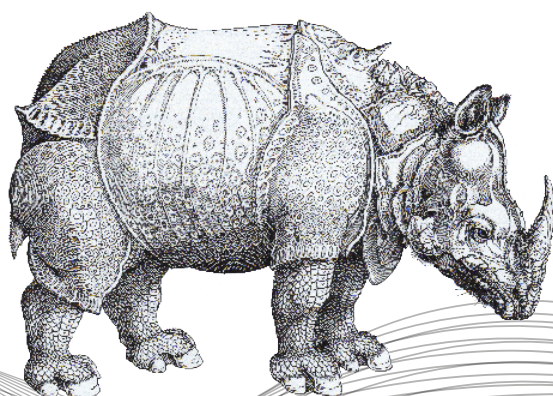
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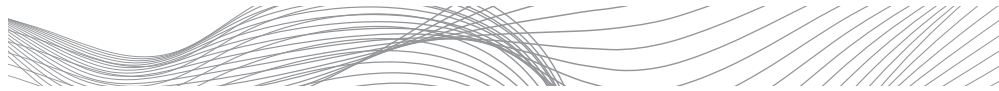
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Highlights

- This paper examines the implications of the emergence of the RAN's SSN capability for Russia's security, namely the safety of its submarine-based strategic nuclear deterrent operated by the Pacific Fleet from its base in Vilyuchinsk on the Kamchatka Peninsula. As a result of such analysis, potential risk reduction measures are set forth to be explored with Australia in due course.
- From the late 2030s onwards, the RAN's SSN capability will be at a level posing a persistent risk to the survivability of the Russian Pacific Fleet's strategic deterrent.
- The aim of the proposed risk reduction measures is to reduce the chance of miscalculation, garbled reading of intentions, and potentially inadvertent conflict arising out of the RAN's SSN operating in a way that holds at risk SSBNs of the Russian Pacific Fleet.
- It is suggested that Australia commit that its SSNs shall not:
 - approach Russian SSBN base Vilyuchinsk within range of their strike weapons;
 - enter the Sea of Okhotsk;
 - engage with the US Navy or British Royal Navy in under the ice training exercises.
- By exploring at an opportune time the diplomatic option of a suggested discussion with Russia and making known her own expectations, Australia will be serving its national interests best. Otherwise, strategic risk may become too high and the potential cost too great.



Dealing with the Royal Australian Navy's SSN Capability: Risk Reduction Options¹

Vladimir Ladanov

In our earlier research paper we have already looked at some of the aspects of the AUKUS agreement concluded between Australia, the United Kingdom, and the United States with the primary aim of equipping the Royal Australian Navy (RAN) with fast attack nuclear-powered submarines (SSNs)². This paper will examine the implications of the emergence of the RAN's SSN capability for Russia's security, namely the safety of its submarine-based strategic nuclear deterrent operated by the Pacific Fleet from its base in Vilyuchinsk on the Kamchatka Peninsula. As a result of such analysis, potential risk reduction measures will be set forth to be explored with Australia in due course.

AUKUS DEVELOPMENTS

Since the unveiling of the optimal pathway for the RAN's SSN capability delivery by the leaders of AUKUS countries on 14 March 2023 at Point Loma Naval Base in California, the trilateral project has been taking important steps towards making it a reality. In December 2023, the US Congress passed the National Defense Authorization Act clearing the sale of three Virginia-class SSNs to Australia. In November 2023, at the Naval Submarine League's annual symposium senior US Navy officers presented a schedule for the transfer of SSNs to Australia³. According to them, in 2032 and 2035, the United States will sell in-service Block IV Virginia-class boats, followed by a new Block VII boat in 2038. That should take care of Australia's requirements until the arrival in the early 2040s of the RAN's first SSN-AUKUS class submarine designed by Britain and built in Adelaide, South Australia. But if that is delayed, the United States has committed to selling Australia two more Virginia-class SSNs.



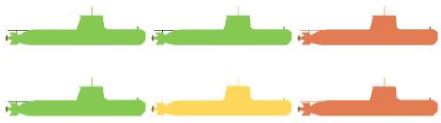
¹ The paper is based on the information in the public domain. The views expressed are the author's alone and do not necessarily reflect those of the Ministry of Foreign Affairs of Russia.

² Ladanov V. AUKUS and Australia's Defence Strategy / Ed. E. Karnaukhova, L. Tsukanov. M.: PIR Press, 2023. – 17 p. – (*Security Index Occasional Paper Series*). URL: <https://pircenter.org/wp-content/uploads/2023/07/SI-INT-3-37-Ladanov.pdf>

³ Katz J. US Navy sub boss reveals new details on AUKUS Virginia class sub sales to Australia // *Breaking Defense*. November 8, 2023. URL: <https://breakingdefense.com/2023/11/us-navy-sub-boss-reveals-new-details-on-aukus-virginia-class-sub-sales-to-australia/>; Eckstein M. Here's when the US Navy plans to sell subs to Australia under AUKUS // *Defense News*. November 16, 2023. URL: <https://www.defensenews.com/naval/2023/11/13/heres-when-the-us-navy-plans-to-sell-subs-to-australia-under-aukus/>

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What this means in practical terms is that if the RAN's force generation cycle complies with the *rule of three* (three vessels are required to reliably operate one), by the late 2030s it should be able to have one SSN often available for deployment⁴. The RAN's current fleet of six Collins-class diesel-electric submarines has the requirement of having two deployable submarines consistently available. The way that figure is arrived at is illustrated in the chart below⁵.

 <p>Assured by...</p>	<p>Two deployable submarines consistently available.</p>
 <p>Underpinned by...</p>	<p>Four submarines in-service with the Fleet Commander. Three submarines consistently available for tasking, with one in shorter-term maintenance.</p>
	<p>Six submarines in the fleet. Two in long-term maintenance and upgrade.</p>

Current RAN Submarine Squadron's force generation template

The chart, though, illustrates how things should work ideally but not necessarily how they are in reality. Serious deficiencies in the Collins-class availability rate were exposed by the Australian Broadcasting Corporation's Four Corners programme in May 2023⁶. And such failures occur even barring major submarine accidents that may unpredictably derail the normal running of the force generation cycle. Jennifer Parker, a former RAN officer, described her expectation of what the RAN's SSN capability may look like when fully operational:

(...) under the rule of three, (...) a fleet of eight (...) will give the RAN the ability to have two to three operational at any one time – assuming that three will be in refit and two or three will be at various stages of force generation, leaving two or three for operational deployments⁷.

⁴ Hellyer M., Nicholls A. Australia's transition to nuclear-powered submarines could run into the 2060s // The Strategist. Australian Strategic Policy Institute. July 7, 2022. URL: <https://www.aspistrategist.org.au/australias-transition-to-nuclear-powered-submarines-could-run-into-the-2060s/>

⁵ Coles J. Study into the Business of Sustaining Australia's Strategic Collins Class Submarine Capability. Progress Review – March 2014 // Department of Defence. 2014. P. 6. URL: https://www.aspistrategist.org.au/wp-content/uploads/2020/11/Coles_Progress_Review_2016-1.pdf

⁶ Can Australia handle its new fleet of nuclear submarines? | Four Corners // ABC News In-Depth. May 1, 2023. URL: <https://www.youtube.com/watch?v=IqqsIqDbnK4>

⁷ Parker J. Effective anti-submarine warfare requires much more than submarines // The Strategist. Australian Strategic Policy Institute. August 7, 2023. URL: <https://www.aspistrategist.org.au/effective-anti-submarine-warfare-requires-much-more-than-submarines/>



Former Commander of the RAN's Submarine Squadron, Rear Admiral Peter Briggs, has been more restrained in estimating nuclear-powered submarines availability rate:

It takes three to four submarines to guarantee having one available for deployment. The “rule of three” was validated by the Coles review, but that doesn’t include any spare capacity to cope with unexpected defects. The UK and French experiences confirm that four nuclear-powered ballistic missile submarines (SSBNs) are required to sustain one at sea – noting that SSBNs operate in a much lower mechanical and operationally stressed environment than SSNs. (...) Britain’s Royal Navy has six or seven SSNs and four SSBNs operating from one base in a single squadron. Its personnel situation is dire. High wastage rates and shortfalls in many critical categories have reportedly necessitated drafting non-volunteers to submarine training and cannibalising parts and crew to get even one submarine to sea. At times, the RN is unable to achieve even one [SSN]⁸.

The argument for increasing the number of the RAN's SSNs to beyond eight announced by the Albanese government in March 2023 had clearly been considered before. In the recent past, the Morrison government that had initiated AUKUS in September 2021 in its pronouncements referred to the order of *at least eight boats*⁹. In the future, extending the build of SSN-AUKUS for Australia is feasible provided that such a decision is made in advance to allow for the timely manufacture of long-lead items, e.g., the Rolls-Royce nuclear reactors. Indeed, Rear Admiral Briggs believes that 10 SSNs should be the minimal number based on considerations of an efficient build strategy and training an adequate workforce:

My study of British, French and US submarine-crewing policies (...) concluded that a force of 10 SSNs with 10 crews was essential to generate the minimum critical mass of experienced personnel. A smaller force will not generate sufficient highly experienced personnel to oversee the safe technical and operational aspects of the program. (...) A force of 10 SSNs at a three-year drumbeat with a planned 27-year life is the minimum to provide a continuous-build program, avoiding the stop-start situation¹⁰.

⁸ Briggs P. How many nuclear-powered submarines for Australia? // The Strategist. Australian Strategic Policy Institute. October 12, 2023. URL: <https://www.aspistrategist.org.au/how-many-nuclear-powered-submarines-for-australia/>

⁹ Morrison S., Payne M. Joint media statement: Australia to pursue nuclear-powered submarines through new trilateral enhanced security partnership // Australian Government. Defence. September 16, 2021. URL: <https://www.minister.defence.gov.au/statements/2021-09-16/joint-media-statement-australia-pursue-nuclear-powered-submarines-through-new-trilateral-enhanced-security-partnership>

¹⁰ Briggs P. How many nuclear-powered submarines for Australia? // The Strategist. Australian Strategic Policy Institute. October 12, 2023. URL: <https://www.aspistrategist.org.au/how-many-nuclear-powered-submarines-for-australia/>

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What the above means for our further examination is that, if the stars align for the RAN, by the late 2030s it will probably acquire a capability enabling it to have one and by the late 2040s two SSNs consistently available for deployment.

ASSESSING THE THREAT POSED BY THE RAN'S SSN CAPABILITY TO THE RUSSIAN PACIFIC FLEET'S STRATEGIC DETERRENT

In this part, we will look at the implications of the RAN's forward projected SSN capability for the safety of the Russian Navy's strategic deterrent posture in the Far East.

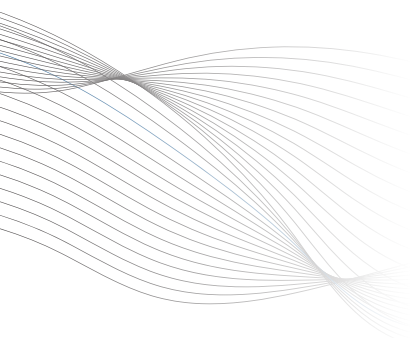
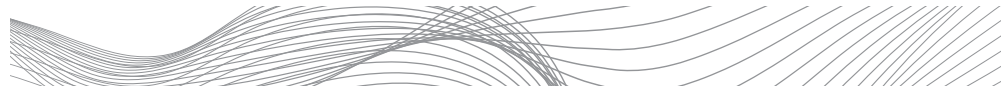
The Russian Pacific Fleet's nuclear-powered ballistic missile submarines (SSBNs) homeported in Vilyuchinsk, the Kamchatka Peninsula, together with their counterparts operated by the Northern Fleet serve as a seaborne leg of the national strategic nuclear deterrent force. Western experts estimate that as its modus operandi this force continues to pursue the Soviet Bastion strategy whereby SSBNs on deterrent patrols seek shelter from US/NATO antisubmarine forces by limiting their operating areas to the seas within easy reach of protective aerial, air-defence, surface and subsurface platforms. Accordingly, the Sea of Okhotsk became a bastion for the Pacific Fleet's strategic deterrent¹¹. Such SSBNs and the bastion concept came to be recognised in the West as the centrepiece of Russia's survivable second-strike capability¹².

(...) the Soviet Navy now intended to withdraw its vulnerable SSBNs, armed with long-range missiles with sufficient range to reach the United States, to waters such as the White Sea, the Sea of Okhotsk and shallow territorial waters around the Kamchatka Peninsula and Novaya Zemlya. Once stationed in these areas Soviet SSBNs no longer needed to transit through the chokepoints and acoustic barriers of the GIUK [Greenland-Iceland-UK] Gap to attack targets in the United States and Europe. This new approach, sometimes termed "the bastion strategy", allowed Soviet SSBNs to

¹¹ Dyndal G.L. 50 years ago: The origins of NATO concerns about the threat of Russian strategic nuclear submarines // NATO Review. March 24, 2017. URL: <https://www.nato.int/docu/review/articles/2017/03/24/50-years-ago-the-origins-of-nato-concerns-about-the-threat-of-russian-strategic-nuclear-submarines/index.html> ; Kjellén J. The Russian Northern Fleet and the (Re)militarisation of the Arctic // Arctic Review on Law and Politics. 2022. Vol. 13. P. 34-52. URL: <https://arcticreview.no/index.php/arctic/article/download/3338/6318?inline=1#FN21> ; Frühling S. SSBN, Nuclear Strategy and Strategic Stability / The Future of the Undersea Deterrent: A Global Survey // Ed. by R. Medcalf, K. Mansted, S. Frühling, J. Goldrick. Australian National University National Security College, 2020. P. 8. URL: <https://nsc.crawford.anu.edu.au/publication/16145/future-undersea-deterrent-global-survey> ; Muraviev A.D. Battle Reading the Russian Pacific Fleet 2023-2030. Sea Power Centre - Australia, 2023. P. 10. URL: <https://www.navy.gov.au/media-room/publications/battle-reading-russian-pacific-fleet-2023-2030>

¹² Kofman M. The Role of Nuclear Forces in Russian Maritime Strategy / The Future of the Undersea Deterrent: A Global Survey // Ed. by R. Medcalf, K. Mansted, S. Frühling, J. Goldrick. Australian National University National Security College, 2020. P. 32. URL: <https://nsc.crawford.anu.edu.au/publication/16145/future-undersea-deterrent-global-survey>

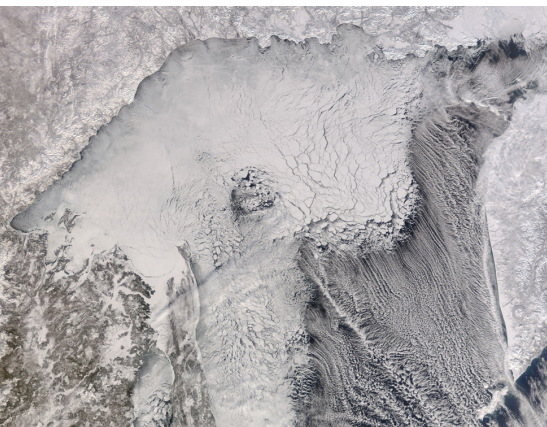
Russian SSBNs
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conduct patrols in friendly home waters, close to the Soviet Union, where it was difficult for Royal Navy and US Navy submarines to remain undetected. It also allowed the Soviet submarine fleet to exploit the protection of the Arctic ice cap and by the early 1980s there was increasing evidence that more and more Soviet submarines were operating under it¹³.

In addition to being semi-enclosed by the continental part of Russia and the Kuril Islands chain from the east, the Sea of Okhotsk as an SSBN bastion also has the advantage of being largely covered by ice for several months every year, thereby protecting SSBNs lurking under it from detection and pursuit by maritime patrol aircraft, surface ships, and their anti-submarine helicopters.

The ice cover in the Sea of Okhotsk reaches its highest development in March, when the average ice concentration reaches 79% (the range of oscillations is 56-99%; the surface area of the Sea of Okhotsk, which is 1 603 200 km², is assumed to be 100%). In very severe winters, open water can be found only near the Central Kurils. In the mildest winters, the ice edge in the west and north of the sea is located 150-180 miles from the continental coast¹⁴.



The Sea of Okhotsk in February 2007, with Sakhalin in the lower left and Kamchatka on the right of the image

Source: www.earthobservatory.nasa.gov

During that period of the year, the greatest threat to SSBNs patrolling in the Sea of Okhotsk arises from hostile SSNs in the area. In the late 1950s, both US and Soviet navies learned from experience that diesel-electric submarines were not suited to sustained under the ice navigation¹⁵ while nuclear-powered boats had to be equipped with custom-designed ice detection sensors, their crews received specialised training and special tactics were developed for safe and effective operations in such a challenging environment. Beginning in the 1970s, the British Royal Navy also began its under the ice SSN operations assisted in that endeavour by the US Navy to test the capability to detect, intercept and shadow Soviet submarines operating under the ice cap. The real life experience of going against them was described as *challenging* and detecting Soviet submarines there as *problems, problems, problems*¹⁶. The United States and the United Kingdom continue their joint training activities; e.g., in 2018, a Royal Navy submarine Trenchant operated with US Navy submarines Hartford and

¹³ Hennessy P., Jinks J. The Silent Deep: The Royal Navy Submarine Service Since 1945. London: Penguin, 2015. P. 450-451.

¹⁴ Minervin I.G., Romanyuk V.A., Pishchalnik V.M., Truskov P.A. Zoning the ice cover of the Sea of Okhotsk and the Sea of Japan // Herald of the Russian Academy of Sciences. 2015. № 85 (2). P. 135. URL: https://www.researchgate.net/publication/276512624_Zoning_the_ice_cover_of_the_Sea_of_Okhotsk_and_the_Sea_of_Japan/link/5a422f5da6fdcce19713a62a/download?__tp=eyJjb250ZXh0Ijp7ImZpcnNOUGFnZSI6InB1YmtpY2F0aW9uIn19

¹⁵ Komarov M.P. Podvodniki uhodyat pod led [Submariners move under the ice]. St. Petersburg: Morskoe nasledie, 2014. P. 19, 31-32.

¹⁶ Komarov M.P. Podvodniki uhodyat pod led [Submariners move under the ice]. St. Petersburg: Morskoe nasledie, 2014. P. 83-84, 261; Hennessy P., Jinks J. The Silent Deep: The Royal Navy Submarine Service Since 1945. London: Penguin, 2015. P. 457-458.

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Connecticut in the Arctic during the US-led Ice Exercise-18 (ICEX)¹⁷.

Though it is not our intention to assess the state of readiness of the SSBN and SSN forces of the Russian Pacific Fleet's squadron in Kamchatka or its capacity to generate patrols, a short introduction is required for the purpose of threat assessment posed by a hostile SSN operating in the vicinity. For an open-source analysis of the squadron's order of battle one may consult a periodically updated tally in Alexander Shishkin's informative blog¹⁸. To get a rough idea of its patrol generation capacity a previously referred to *rule of three* may be applied, i.e., a three-vessel pool allows one vessel to be on patrol at any given time or, more realistically, Rear Admiral Briggs's observation that Britain's continuous at sea deterrence posture – always maintaining one SSBN on patrol in the North Atlantic – requires a pool of four boats, and even that arrangement works under stress. Also relevant is the assessment by US experts that the Soviet Navy at its peak in the mid-1980s had its SSBN tempo of deployments much lower than the US Poseidon/Trident force suggesting a possibly lower state of readiness¹⁹. Apposite to our analysis is the recognition that, unlike when at sea, submarines moored in their bases are particularly vulnerable to attacks by modern strike weapons as evidenced by the events of 2023.

With the Russian force posture and operating environment set out, it is now time to assess the risk posed by the RAN's SSN seeking to threaten the safety of the strategic deterrent. For that, we will look at intent and capability.

Beginning with intent, it is clear that in the past several years successive Australian governments from both sides of politics (the Liberal/National Coalition and Labor) have gone out of their way to demonstrate undisguised hostility towards Russia, especially in the context of the conflict in Ukraine. By supplying weapons to the adversary and providing training to his armed forces, Australia's foreign policy elites have left no doubt that they want Russia defeated. Recently, the Australian Defence Force (ADF) has moved one step closer to direct involvement in the conflict by dispatching its E-7A Wedgetail Airborne Early Warning and Control Aircraft to Germany to fly missions in support of operations against the Russian Armed Forces²⁰. Embracing the American concept of great-power competition, Australia's national security establishment has put its foot on the accelerator of unbridled military integration with the United States with the



Russian Pacific Fleet's submarine squadron at its base in Vilyuchinsk, Kamchatka

Source: www.x.com

¹⁷ Royal Navy submarine breaks through Arctic ice for major exercise // Royal Navy. March 15, 2018. URL: <https://www.royalnavy.mod.uk/news-and-latest-activity/news/2018/march/15/180315-iceex-2018>

¹⁸ Navy-Korabel blog. URL: <https://navy-korabel.livejournal.com/296027.html>

¹⁹ Breemer J.S. A Soviet SSBN "Bastion" strategy? // The Submarine Review. July 1985. URL: <https://archive.navalsubleague.org/1985/a-soviet-ssbn-bastion-strategy>

²⁰ Trusted eyes into the European skies // Australian Government. Defence. December 19, 2023. URL: <https://www.defence.gov.au/news-events/news/2023-12-19/trusted-eyes-european-skies#:~:text=The%20Wedgetail%20E%2D7A%20and,flying%20missions%20have%20successfully%20commenced.>



AUKUS submarine deal as its most vivid manifestation. Concurrently, evolving US Enhanced Force Posture Initiatives in Australia aim to “support high-end warfighting and combined military operations in the region”²¹. This also applies to strategic strike operations such as the US Air Force’s plans to deploy up to six B-52 nuclear-capable bombers at the Royal Australian Air Force base Tindal in the Northern Territory once upgrades at that facility are finished²². Speaking at the Center for Strategic and International Studies in Washington, Deputy Prime Minister and Minister for Defence, Richard Marles, was transparent about his enthusiasm for Australia being intermeshed operationally with the United States:

*We are making big investments in defence capital infrastructure to support, maintain and sustain the growing number of Australian and American forces. We will operationalise a regular presence and an increased exercise tempo. We will move beyond interoperability to interchangeability. And we will ensure we have all the enablers in place to operate seamlessly together, at speed*²³.

His words were echoed by the Biden administration’s then Indo-Pacific Coordinator and key US official behind AUKUS, Kurt Campbell, who referring to Australia spoke in November 2021 of a “deeper interconnection, almost a melding of our services”²⁴. It is important to keep in mind that the US and Australian forces have fought side-by-side for more than one hundred years in every major conflict since World War I.

Former Australian Deputy Secretary of Defence and now Emeritus Professor at the Australian National University, Hugh White, opined that:

Marles’ words in his CSIS speech – especially his talk of “moving beyond interoperability” and of making “big investments” to “support, maintain and sustain” US as well as Australian forces – is the strongest statement we have seen that the old post-Vietnam defence of Australia focus ... has been abandoned in favour of a policy to design, build and invest in our forces specifically to

²¹ Joint Statement Australia–U.S. Ministerial Consultations (AUSMIN) 2021 // Australian Government. Department of Foreign Affairs and Trade. URL: <https://www.dfat.gov.au/geo/united-states-of-america/ausmin/joint-statement-australia-us-ministerial-consultations-ausmin-2021#:~:text=Enhanced%20Force%20Posture%20Cooperation%20and%20Alliance%20Integration&text=Reestablished%20at%20AUSMIN%202020%2C%20the,region%20and%20deter%20our%20adversaries>.

²² Grigg A., Robinson L., Bali M. US Air Force to deploy nuclear-capable B-52 bombers to Australia as tensions with China grow // ABC News. October 30, 2022. URL: <https://www.abc.net.au/news/2022-10-31/china-tensions-taiwan-us-military-deploy-bombers-to-australia/101585380>

²³ The U.S.-Australia Alliance: Aligning Priorities in the Indo-Pacific with Deputy Prime Minister Richard Marles // Center for Strategic and International Studies. July 11, 2022. URL: <https://www.csis.org/events/us-australia-alliance-aligning-priorities-indo-pacific-deputy-prime-minister-richard-marles>

²⁴ Beyond AUKUS and the Quad: What’s Next for the U.S. Indo-Pacific Strategy. A Conversation with Indo-Pacific Coordinator Kurt Campbell in the Aftermath of the Biden-Xi Summit // United States Institute of Peace. November 19, 2021. URL: <https://www.usip.org/events/beyond-aukus-and-quad-whats-next-us-indo-pacific-strategy>

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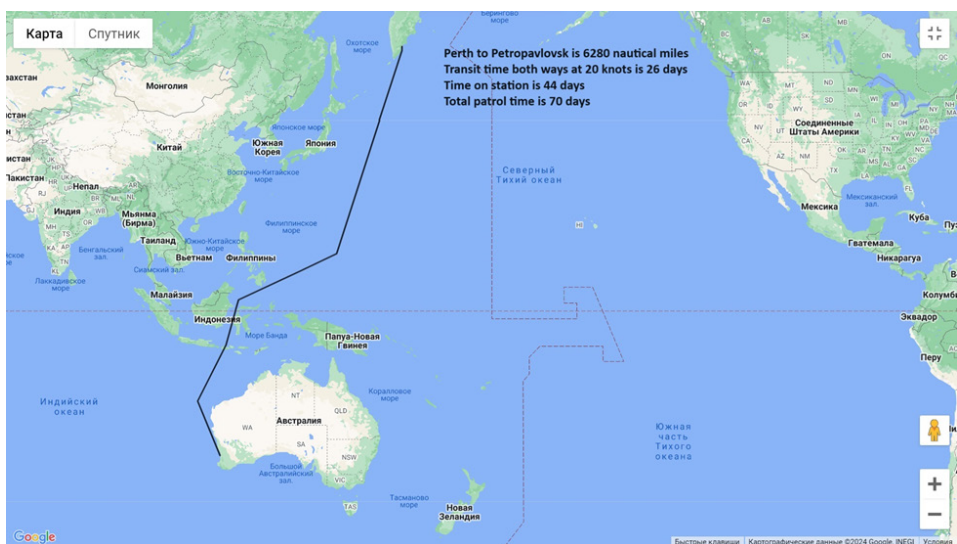
support American forces in US-led coalition operations²⁵.

Associate Professor of National Security and Strategic Studies at Curtin University in Perth, Alexey D. Muraviev, who is the RAN-funded scholar, has implied that:

Australia's decision to acquire nuclear-powered platforms from the United States and United Kingdom suggests our intent to support and engage in long-range maritime operations with our allies, possibly as far as the northern Pacific and Arctic oceans. This clearly shows that if war someday breaks out in the Pacific, the Russian Pacific Fleet could present a formidable challenge to Australian and allied naval fleets in the western and northwestern Pacific, as well as the Arctic²⁶.

We summarise by concluding that Australia's deep state not only has a hostile demeanour towards Russia, but it also works assiduously to integrate the ADF with the US military posture in the Indo-Pacific. At this stage, it is difficult to ascertain with a good degree of confidence whether in the future that may translate into the RAN conducting combined operations with the US Navy against Russian SSBNs in the Far East. Nonetheless, such an option may not be discarded because a credible analysis must examine worst-case high-impact scenarios especially when the survivability of Russia's second-strike nuclear force may be at stake.

Having looked at intent, it is now opportune to consider the RAN's upcoming SSN capability from the angle of its damage dealing capacity. We have already noted that the United States intends to sell Australia two second hand Virginia-class Block IV boats and one new Block VII boat. They will be followed in the 2040s by the British designed SSN-AUKUS, which will incorporate American vertical launch system and weapons²⁷.



Compiled by the author

²⁵ Hardaker D. "Interchangeable": Richard Marles in lockstep with the US Navy's holy grail of integrated forces // Crikey. April 21, 2023. URL: <https://www.crikey.com.au/2023/04/21/richard-marles-us-navy-aukus-integrated-forces/>

²⁶ Muraviev A.D. Australia can no longer afford to ignore Russia's expanding naval power in the Pacific // The Conversation. December 20, 2023. URL: <https://theconversation.com/australia-can-no-longer-afford-to-ignore-russias-expanding-naval-power-in-the-pacific-217913>

²⁷ Australia's nuclear-powered submarines // Australian Government. Australian Submarine Agency. URL: <https://www.asa.gov.au/aukus/australias-nuclear-powered-submarines>



From the late 2030s onwards, the RAN's SSN capability will be at the level posing a persistent risk to the survivability of the Russian Pacific Fleet's strategic deterrent

Initially, all RAN's SSNs will be based at HMAS Stirling near Perth, Western Australia. A rough calculation of the route's distance from Perth to Petropavlovsk-Kamchatsky and the time that it would take an SSN with an assumed average transit speed of 20 knots to cover it indicates that about two weeks after leaving the base it will arrive at the Avacha Bay or, alternatively, in the Sea of Okhotsk. Subtracting the same amount of time required for the return leg and allowing for a 70-day total patrol time consistent with international SSN standards and also Collins-class endurance²⁸, the RAN's Virginia-class boat will have many weeks on station in this operationally sensitive area. If the RAN goes ahead with the Morrison government's original plan and splits its future SSN squadron in two and moves half of it to a new base on the East Coast, such as Port Kembla, Newcastle or Brisbane²⁹, transit from there to Kamchatka will be shorter giving more time on station. From the vicinity of Vilyuchinsk, SSN's operating mode will likely be to exploit the vulnerability of an SSBN exiting port and as the British Flag Officer Submarines' Staff described it get "on the tails of the most threatening of the enemy submarines" and in a war attack "submarines immediately on leaving their bases, by either mines or torpedoes, or both"³⁰.

While little detail is publicly available about Virginia-class Block VII features, except that it will not incorporate Block V's Virginia Payload Modules (large missile magazines positioned amidships), Block IV is known to have two Virginia Payload Tubes in the bow, each for six Tomahawk Land Attack Missiles (TLAM), and its four torpedo tubes and torpedo room have capacity for about 25 additional TLAMs or other torpedo-sized weapons³¹. Assuming that conventionally armed TLAMs have a 1000-pound-class warhead and a 2000 km striking range³², that would be the distance from which the RAN's SSN will be able to threaten the Pacific Fleet's submarines moored at their base in Vilyuchinsk with a 12-missile salvo delivering a truckload of high explosives to the target. Should Australian SSNs receive the Conventional Prompt Strike

²⁸ Woolner D. Getting in Early: Lessons of the Collins Submarine Program for Improved Oversight of Defence Procurement. Research Paper N° 3 2001-02. Canberra: Department of the Parliamentary Library, 2001. P. 20. URL: https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/5VY46/upload_binary/5vy468.pdf;fileType=application%2Fpdf#search=%22library/prspub/5VY46%22 ; 60 let divizii podvodnyh lodok krasnoznamennyh podvodnyh sil Severnogo flota [60th Anniversary of the Submarine Division of the Red-Banner Submarine Force of the Northern Fleet] // Morskoy Sbornik. 2024. N° 1. P. 35. URL: <https://morskoybornik.ric.mil.ru/upload/site231/ladkQQDhN8.pdf>

²⁹ Morrison S., Dutton P. Australia to build additional submarine base. Joint media release // Australian Government. Defence. March 7, 2022. URL: <https://www.minister.defence.gov.au/media-releases/2022-03-07/australia-build-additional-submarine-base>

³⁰ Hennessy P., Jinks J. The Silent Deep: The Royal Navy Submarine Service Since 1945. London: Penguin, 2015. P. 297, 425.

³¹ Greene A. First newly built nuclear-powered submarine under AUKUS likely to be sold in 2038, US admiral reveals // ABC News. November 9, 2023. URL: <https://www.abc.net.au/news/2023-11-09/aukus-submarine-sales-timelines-revealed/103083780> ; Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress // Congressional Research Service. April 16, 2019. P. 8. URL: <https://crsreports.congress.gov/product/pdf/RL/RL32418/170#:~:text=Issues%20for%20Congress%20regarding%20the,in%20FY2020%3B%20and%20the%20potential>

³² Dibb P. Will China target Australia and how would Australia respond? // The Strategist. Australian Strategic Policy Institute. August 9, 2023. URL: <https://www.aspistrategist.org.au/will-china-target-australia-and-how-would-australia-respond/>

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hypersonic weapon expected to begin fielding with the US Navy's Virginia-class in 2029 that striking range will expand to about 3000 km³³.

In addition to the base strike option, a hostile SSN with its crew well versed in under the ice operations and fitted out with advanced ice navigation sensors is uniquely positioned to successfully penetrate the Sea of Okhotsk bastion to seek out a patrolling Russian SSBN.

An aggressor would always inevitably try to penetrate the bastion to hold the SSBNs at risk, after all, holding at risk what the adversary values most is the essence of deterrence doctrine³⁴.

Summing up, intent and capability analysis demonstrates that from the late 2030s onwards, the RAN's SSN capability will be at a level posing a persistent risk to the survivability of the Russian Pacific Fleet's strategic deterrent.

EXAMINING POTENTIAL RISK REDUCTION OPTIONS WITH AUSTRALIA

Based on the threat analysis, we may offer for discussion several risk reduction measures to be pursued with Australia at the appropriate juncture. Their aim is to reduce the chance of miscalculation, garbled reading of intentions and potentially inadvertent conflict arising out of the RAN's SSN operating in a way that holds the SSBNs of the Russian Pacific Fleet at risk. If the RAN intends to do exactly that, these options certainly do not apply, but for the time being we are assuming that it is not the case.

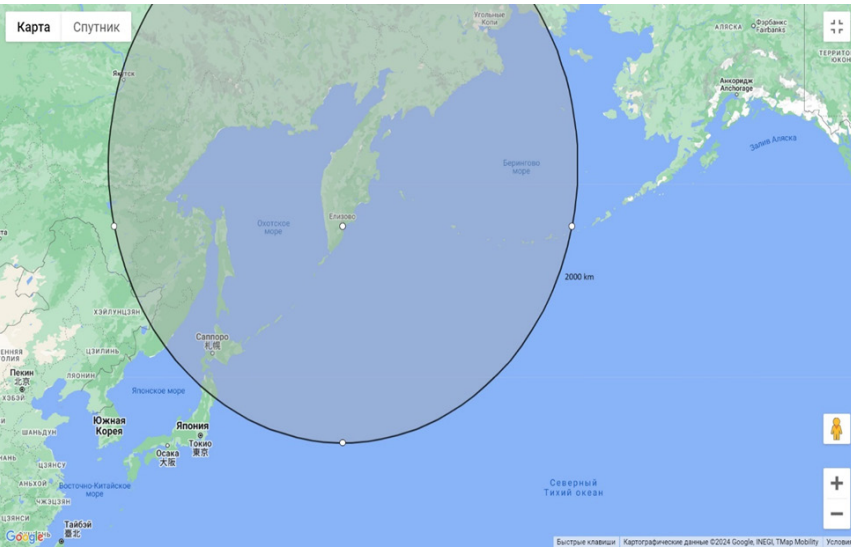
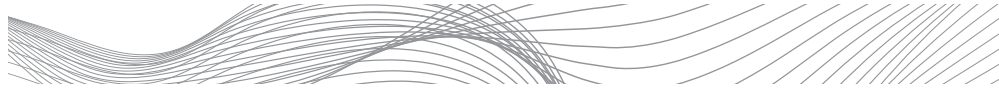
The preparedness of the RAN, ADF, and the Australian government in general to engage with Russia in the fullness of time in productively addressing such concerns may serve as a good indicator of their true intentions. The shape and form of potential measures may be different



Source: General Dynamics
Electric Boat

³³ Dean S.E. Conventional Prompt Strike: The US Navy's Hypersonic Weapons Programme // European Security and Defence. April 12, 2023. URL: <https://euro-sd.com/2023/04/articles/30723/conventional-prompt-strike-the-us-navys-hypersonic-weapons-programme/>; Abdi Z. US Army and Navy Hypersonic Weapon Test Delayed Once More // Naval News. September 9, 2023. URL: <https://www.navalnews.com/naval-news/2023/09/army-and-navy-hypersonic-weapon-test-delayed-once-more/#:~:text=The%20Navy%20expects%20the%20first,the%20fourth%20quarter%20of%202027.>

³⁴ Kristensen H.M., Korda M. Arms Control and Sea Launched Nuclear Weapons / The Future of the Undersea Deterrent: A Global Survey // Ed. by R. Medcalf, K. Mansted, S. Frühling, J. Goldrick. Australian National University National Security College, 2020. P. 12. URL: <https://nsc.crawford.anu.edu.au/publication/16145/future-undersea-deterrent-global-survey>



Compiled by the author

but for now we have identified several that, if implemented, may reduce the exposure and enhance the safety of Russia's Far Eastern seaborne strategic deterrent.

1. Australia commits that its SSNs shall not approach Russia's SSBN base Vilyuchinsk within range of their strike weapons.

The limits of the exclusion zone will depend on what experts agree is the farthest range of the most potent strike weapon that

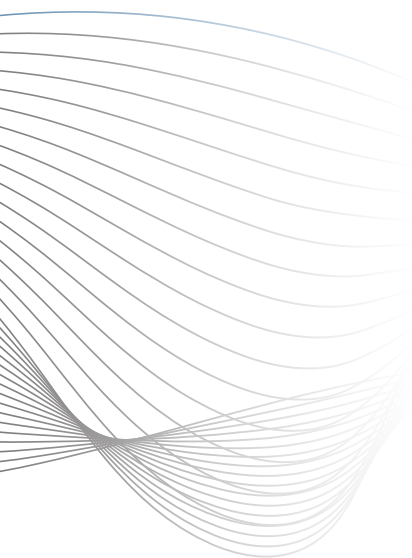
the RAN's SSNs will carry, be it a Tomahawk Land Attack Missile Conventional Prompt Strike or anything else. This measure is aimed at protecting SSBNs when they are moored at their base.

There is a risk that without formally breaking the terms, an SSN may be patrolling just outside the agreed perimeter and be able to move within range quickly. While true, the presented set of measures works only in case of a good faith approach and if bad faith is detected the agreement is probably off.

For illustrative purposes, the image above depicts a 2000 km radius no-go area believed to represent the striking distance of a Tomahawk missile.

2. Australia commits that its SSNs shall not enter the Sea of Okhotsk.

The Sea of Okhotsk has the benefit of having its boundaries clearly defined and being enclosed by obvious geographic features, so entering it by accident is highly unlikely. Nor is it a transit area leading somewhere else, like the Mediterranean; thus, there is no need for an SSN to be there unless for a particular reason. This measure is designed to protect the SSBN bastion from penetration and ensure the safety of a patrolling SSBN from being tracked and engaged by a fast attack nuclear-powered submarine. The Sea of Okhotsk is subsumed by the estimated area of the strike weapons exclusion zone in the image above, but we believe this measure should be included separately for an unlikely case of the RAN's SSNs not carrying strike weapons or having shorter range strike weapons, and also for the significance of protecting the bastion in its own right.



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3. Australia commits that its SSNs shall not engage with the US Navy or the British Royal Navy in under the ice training exercises.

Though the Sea of Okhotsk is substantially covered by ice only for several months annually, the expertise in under the ice operations is essential for successful SSN versus SSBN scenarios not least for the fact that a potentially dynamic operational situation may not necessarily wait several months until the ice thaws and the environment becomes straightforward again. This measure complements the previous one by extending the break-out time for the RAN, should it withdraw from these risk reduction measures, by requiring it to first receive specialised training from the United States and Britain before being able to mount effective year-round SSN patrols in the Sea of Okhotsk. In terms of operational scenarios, under the ice SSN training is relevant only for defeating the Russian Navy's bastion strategy so by not pursuing it the RAN should not otherwise lose any of its tactical flexibility.

How the aforementioned understandings may be formalised is less important than their content. As long as the substance is well understood and there is a genuine commitment to abide by the agreement, we should be good to go. Verification of compliance may be performed by Russia's national technical means, primarily all sorts of submarine detection sensors mounted on aerial, surface and subsurface assets in the area. If helpful, a dedicated channel of communication for addressing issues arising from the implementation of the agreement may be set up between the Russian Navy's Headquarters and the RAN.

The basic assumption of this scheme is that, upon reflection, Australia will come to the conclusion that going for it is in its national interest.

During the Cold War, as part of the alliance with the United States Australia hosted several US military facilities including the North West Cape and Nurrungar but the most prominent of which was Pine Gap believed to have a major role in American signals intelligence, satellite surveillance operations, and other programmes. Its importance in the East-West confrontation was such that Australia's leadership at that time was prepared to live with the knowledge that Pine Gap and other "US facilities in Australia might be targeted relatively early in a strategic nuclear war". In 1981, the Australian Parliament's Joint Committee on Foreign Affairs and Defence concluded in its report that "it would be prudent for Australian defence planners to assume that the joint facilities ... are on the Soviet target list and might be attacked in the course of the conflict between the two superpowers". Australia's premier intelligence agency, the Office of National Assessments, anticipated that an attack on Pine Gap would take the form of an "air burst ... perhaps involving the detonation of about a one megaton warhead at an altitude of about 1000 m to 1500 m ... An explosion at this altitude would maximise the area of blast damage on the



ground, and hence minimise the effect of targeting inaccuracy³⁵. The Australian establishment's acceptance of that was possibly influenced by the fact that the facility was staffed mostly by American personnel, the nearby town of Alice Springs had few inhabitants and there was no significant human population for hundreds of miles around. But it may be a different matter and a different calculus if strategic risk rises significantly for future RAN's SSN bases, HMAS Stirling near Perth, and Port Kembla/Newcastle in the Sydney area, or Brisbane.

It is the author's view that by exploring at an opportune time the diplomatic option of a suggested discussion with Russia and making known her own expectations Australia will be serving its national interests best. Otherwise, strategic risk may become too high and the potential cost too great. ■

³⁵ Joint Committee on Foreign Affairs and Defence. *Threats to Australia's Security: Their Nature and Probability*. Canberra: Australian Government Publishing Service, 1981. P. 18-19. URL: <https://apo.org.au/node/39901>; ONA's 1981 study is quoted in Tom Gilling. *Australia is Exposed to Nuclear Attack* // *The Australian*. September 10, 2022. URL: <https://www.theaustralian.com.au/inquirer/mind-the-gap-where-australia-is-exposed-to-nuclear-attack/news-story/560837ea2b5f36a44db952d397b8236a>

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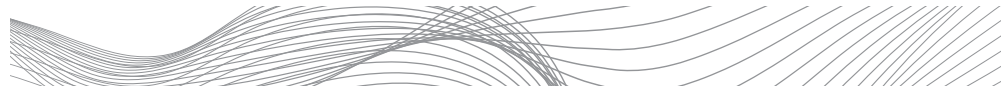
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FUTURE OF THE NPT & RUSSIA'S INTERESTS

This occasional paper was made within the framework of the project *Future of the NPT and Russia's Interests*, which is part of the *Nuclear Nonproliferation and Russia Program*.

The Nuclear Non-Proliferation Treaty (NPT), which entered into force in 1970, still remains a key element of the entire international security architecture. The goal of this project is to provide a quality expert assessment of the issue, and by arranging various platforms for discussions, to facilitate a more constructive debate of the problems currently facing the nuclear nonproliferation regime.

The project has been implemented since the founding of PIR Center in 1994. Despite its name, the research activities are not limited to monitoring the Treaty — the focus is on all current challenges and threats related to the three NPT pillars: nuclear nonproliferation, nuclear disarmament and the peaceful use of nuclear energy.