

Australia-India Anti-Submarine Warfare (ASW) Cooperation

Doctrine, Capabilities,
Constraints, and Strategic Futures

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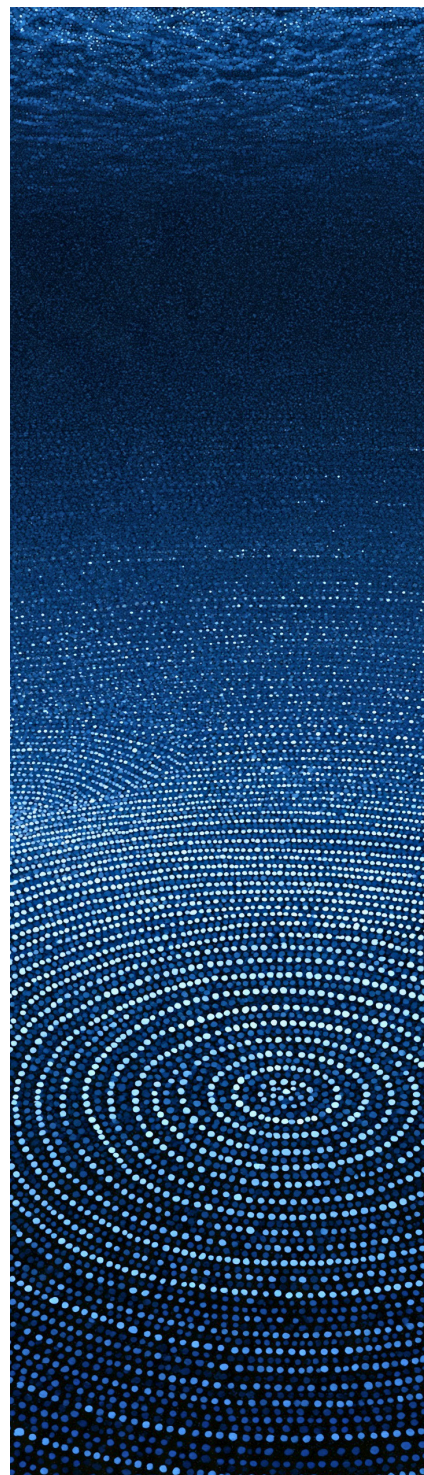
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AUTHORS

Commodore Peter Leavy (Retd)

Peter Leavy recently retired after 40 years of service as a Warfare Officer in the Royal Australian Navy, holding a variety of positions both ashore and at sea. His seagoing career highlights include two sea commands: HMAS Stuart (2005-6) and HMAS Sydney (2009-11), including Northern Trident 09, a global circumnavigation. Ashore, he has worked in direct support to operations, strategic futures, naval history, maritime strategy/doctrine, strategic personnel management, and representational roles. He spent 2016-2018 in Washington, DC, as the Naval Attaché, then served three years as Commandant of the Australian Defence Force Academy, responsible for the academic education and initial training of just under 1200 Midshipmen and Officer Cadets. He retired as the Chief of Staff at Joint Operations Command, supporting ADF elements executing Operations. He is currently the President of the Australian Naval Institute and is undertaking a part-time PhD program at ANU, exploring contemporary maritime strategy for medium powers, using Australia as a case study.



Rear Admiral Shishir C. Verma (Retd)

Shishir C. Verma served the Indian Navy with distinction as a specialist submariner and senior staff officer. A graduate of the National Defence Academy, Defence Services Staff College, and Naval War College, he was commissioned in 1987 and specialised in Navigation and Direction.

He served on Foxtrot and Kilo-class submarines, including as Executive Officer of INS Sindhuratna and INS Sindhuraj, and went on to command INS Sindhukesari as well as the destroyers INS Rajput and INS Ranjit. His staff appointments included Officer-in-Charge of the Submarine School, Director of Submarine Operations, and Principal Director roles in Submarine Operations and Nuclear Acquisition.

He later served as Assistant Chief of Naval Staff (Special Submarine Projects) at Naval Headquarters in New Delhi and as Project Director at HQATVP.



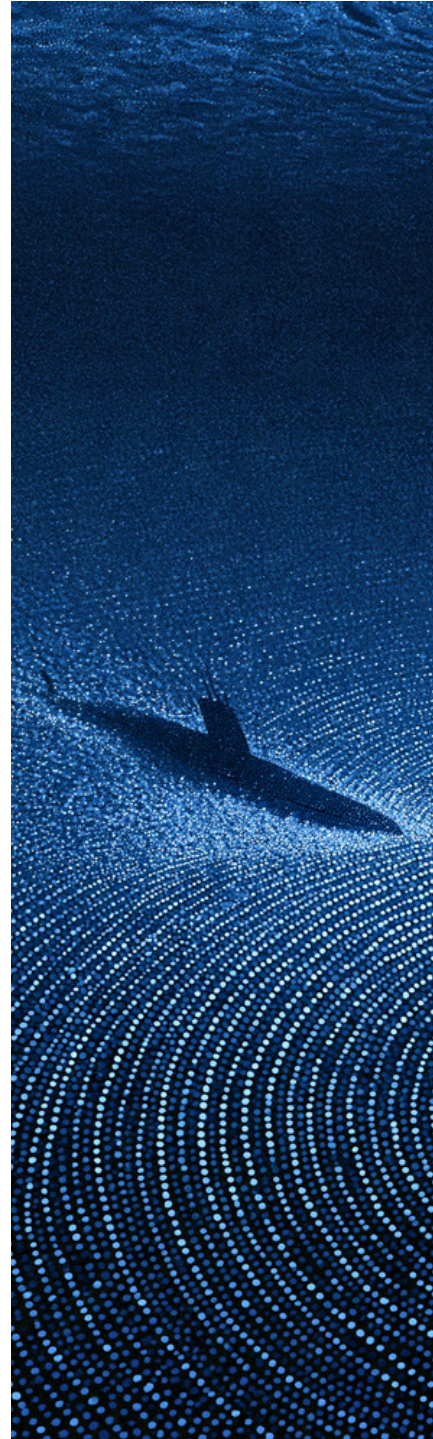
ABOUT THE PROGRAM

This program represents a significant Australia–India initiative to strengthen cooperation in Underwater Domain Awareness (UDA) across the Indo-Pacific. Delivered jointly by the UWA Defence and Security Institute (DSI) and the Council for Strategic and Defense Research (CSDR), the initiative brings together expertise from academia, industry, and government to advance practical collaboration in maritime security.

Designed as a structured, multi-engagement series, the program seeks to deepen mutual understanding of capabilities and intentions, identify shared priorities, and generate tangible policy outcomes. It explores critical dimensions of Underwater Domain Awareness, including maritime domain understanding, anti-submarine warfare, uncrewed underwater systems, undersea search and rescue, and deep-sea awareness, recognising the strategic importance of the undersea environment to regional stability.

Underwater Domain Awareness refers to the capability to observe, detect, and assess underwater activities across oceans, coastal regions, and inland waterways, enabling comprehensive situational awareness of the undersea domain. As close maritime partners, Australia and India share a strong interest in enhancing cooperation in this area to support a secure, resilient, and rules-based Indo-Pacific, and to further strengthen the Australia–India Comprehensive Strategic Partnership.

This 24-month initiative is supported by the Australian Department of Foreign Affairs and Trade through the Australia–India Strategic and Technology Policy Initiative (SATPI). This report represents the second of five publications, as well as a white paper that will be generated from the high-level discussions and collaboration throughout the program. Through this collaboration, UWA DSI and CSDR aim to contribute meaningful policy insights, strengthen institutional linkages, and advance sustained maritime cooperation between Australia and India.



EXECUTIVE SUMMARY

This report examines Australia-India anti-submarine warfare (ASW) cooperation within an increasingly contested Indo-Pacific undersea environment. It argues that meaningful, campaign-level cooperation is both achievable and strategically valuable without requiring alliance-style integration or the sharing of highly sensitive sensor architectures. Cooperation is best structured around aligned doctrine, greater intelligence sharing, and routine operational coordination that builds the enduring relationships between the two operational-level headquarters.

Rather than pursuing technically ambitious but politically unsustainable integration, particularly in areas such as acoustic libraries, seabed sensor data, or strategic deterrent intelligence, Australia and India should prioritise doctrinal alignment, decision-grade information sharing, and mechanisms for sustained, operational coordination. These measures are sufficient to generate improved awareness of submarine activity, disrupt adversary operations, and strengthen deterrence by denial.

China's expanding submarine fleet and its growing operational reach into the Indian Ocean Region (IOR) represent the central pacing challenge. As the PLA-N extends its operational footprint, it also exposes itself to cumulative vulnerabilities across long transit routes, unfamiliar acoustic environments, and extended logistics chains. Australia-India cooperation can exploit these vulnerabilities not through direct confrontation, but through persistence, attribution, and uncertainty under a strategy of deterrence by denial.

This report argues for a shift from operational-level coordination being based on planned exercises to enduring 'real-world' operational cooperation, supported by institutionalised relationships and greater operational coordination.

INTRODUCTION

Indo-Pacific Maritime Security Landscape

The Indo-Pacific has become the primary theatre of great-power competition,¹ and this competition is fundamentally maritime in nature. Dense trade and energy routes, increasingly exploitable offshore resources, and rapidly expanding military capabilities are all evident across the region, which is operationally shaped by geographic chokepoints. Conventional naval power, undersea systems, missile threats, grey-zone coercion, and lawfare² blend into a challenge that no single nation can manage alone. While all these factors will increasingly complicate the maritime security situation in the Indian Ocean, this report focuses on the growing threat posed by submarines and how India and Australia can best cooperate to meet this particular challenge.

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Strategic competition between the US and China is the key dynamic shaping the global order. Resources from the Middle East, Africa and Australia have become increasingly important to China as its economy has grown,³ so China's (and other Asian states') interest in the Indian Ocean Region (IOR) will only increase. While Australia, India and China (indeed, all trading nations) have a vested interest in the security and free flow of goods across the Indian Ocean, there is a growing potential for tension as major naval powers compete for advantage across the region.

The February 2025 circumnavigation of Australia by a PLA-N surface task force is indicative of China's expanding operational confidence, and we should expect to see more such deployments at greater distances from China⁴, including an increasing PLA-N presence in the Indian Ocean region. Indeed, China's declared naval strategy has evolved from a focus on 'near-seas defence' in the mid-1980s to now encompass 'far-seas protection' and, increasingly, 'oceanic presence and expansion into the two poles.'⁵



A Chinese Type 055 destroyer, one of the ships that carried out live-fire exercises roughly 400 miles (340 nautical miles) southeast of Sydney in Feb. 2025.

Source: Chinese Navy

The PLA-N first deployed to the Gulf of Aden in 2008 on a counter-piracy mission.⁶ Chinese submarine deployments commenced in 2012, when a Shang-class nuclear attack submarine (SSN) deployed to the Indian Ocean, ostensibly to support counter-piracy operations, despite submarines being ill-suited for such a role.⁷ Since then, Chinese submarines and support tenders have been making regular deployments into the Indian Ocean,⁸ supported by an increasing marine scientific research effort.⁹

China's naval capabilities in the IOR are further enhanced by a growing network of port-access arrangements with regional states and an increasing number of IOR countries that have acquired, or are acquiring, Chinese submarines and associated Chinese-funded infrastructure.¹⁰ These deployments, port visits, and facilities help the PLA-N build familiarity with the region and develop Chinese logistics capabilities in the Indian Ocean, while binding submarine-purchasing nations more closely to China.

India has a direct and obvious stake in the security of the Indian Ocean, both for territorial integrity and for the protection of trade routes. Chinese naval activity in the IOR is increasingly challenging India's position as the dominant littoral power, and effective management of the undersea domain is central to India's ability to protect its maritime interests.

Australia's interests are also substantial. As a three-ocean, island-trading nation, Australia is heavily reliant on the free flow of goods by sea. Over 99% by volume and 84% by value of Australia's trade travels by sea; trade valued at A\$650 billion in FY2023–24.¹¹ North-west Australia borders the Indian Ocean and accounts for 32.9% of world iron ore exports (valued at A\$124 Bn in 2023-24¹²), 52.9% of lithium, 38.8% of garnet, 16% of zircon, and 12.4% of LNG.¹³ While much of this export trade is with China, Australia is also reliant upon both direct and indirect imports that flow across the Indian Ocean; these imports are vulnerable to disruption, as the 2026 US and Israeli actions against Iran have shown.¹⁴

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The undersea domain is one in which the United States retains a significant advantage, but in which the gap with China is narrowing.¹⁶ China's drive to become a capable deep-water navy is being directed at the highest political levels,¹⁷ with its submarine force expanding both in numbers and quality. Faster construction rates, improving acoustic quieting, and growing crew experience are collectively shifting the undersea balance in ways that complicate ASW for regional navies and expand China's power-projection options into the Indian Ocean.

Why Australia-India Cooperation Matters for This Domain

Australia and India occupy complementary geographic positions across the Indo-Pacific maritime system. India anchors the IOR, sitting athwart critical chokepoints and SLOCs connecting the Middle East, Africa, and East Asia. Australia borders the eastern Indian Ocean and the vital approaches that link the Pacific and Indian Oceans. Together, their maritime domains form a continuous battlespace.

This geography creates strategic opportunities. Submarines based in the Western Pacific must pass either south of Australia or through a limited number of deep-water straits, principally the Lombok and Ombai-Wetar passages through the Indonesian archipelago. There are also supplementary routes through the Sunda and Makassar straits, although they are much shallower. Surveillance architectures oriented around these chokepoints, extending into the

approaches to the Andaman Sea and the central Indian Ocean corridors, can generate decision-grade awareness¹⁸ across the extended transit routes that submarines must use. India and Australia, with their complementary basing geometry and maritime patrol aircraft fleets, are particularly well-positioned to improve their collective awareness.

The region's geography creates structural vulnerabilities that Australia-India cooperation can exploit. The requirement for diesel submarines to regularly snorkel, together with unfamiliar acoustic environments and extended supply chains, exposes submarine operations to risk. Australia-India cooperation can exploit these vulnerabilities through persistence, attribution, and reactive postures that erode the confidence of any potential adversary seeking to deploy submarines into the IOR, to the point where an adversary concludes that costs outweigh benefits. This is the logic of 'deterrence by denial.'¹⁹

Achieving this form of cooperation requires difficult judgments about what is possible and what is not. Submarine operations are among the most sensitive activities governments (not just militaries) undertake.

The central argument of this report is that Australia and India can nonetheless improve their operational-level ASW cooperation without alliance-level integration or shared sensor architectures. The cooperation that matters is alignment of doctrine, sharing of selected information within politically sustainable limits, and the building of enduring institutional relationships between operational-level headquarters. This is a more modest ambition than some analyses suggest, but it is a realistic and strategically valuable one that remains largely unrealised.

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Scope and Exclusions

This report addresses the doctrine, capabilities, constraints, and strategic futures of Australia-India ASW cooperation. It covers the PLA-N submarine threat as the primary driver; the technologies and geographic features that shape undersea surveillance; the respective ASW capabilities of the RAN and Indian Navy, including emerging autonomous systems; the current state of bilateral cooperation; and the role of key partners, including the United States, Japan, and France. It then explores the strategic and operational challenges constraining deeper integration before detailing a framework of opportunities and recommendations organised across near-term (one to three years), medium-term (three to five years), and long-term (beyond five years) planning horizons. The report does not address nuclear deterrence dynamics in detail, the internal politics of defence procurement in either country, or the technical parameters of classified sensor systems.

CURRENT STATE ASSESSMENT

Submarine Detection Technologies and the Indo-Pacific Maritime Geography

Submarine detection is a multi-disciplinary science that blends acoustics, electromagnetics, remote sensing, and signal processing. Historically dominated by sonar, modern undersea surveillance increasingly layers non-acoustic sensors, distributed networks, autonomous systems, and artificial intelligence to find ever-quieter submarines operating in complex littoral and deep-water environments.

Acoustic sensing remains the primary and most mature detection approach, since sound travels farther and more reliably in water than any other signal. Passive sonar listens for sounds submarines generate, such as machinery noise, propeller cavitation, and flow disturbance, using hull-mounted sensors, towed arrays, or seabed hydrophones. Towed arrays (long cables of hydrophones trailed behind surface ships or submarines) provide excellent low-frequency sensitivity and directional resolution, and are central to modern long-range ASW detection and tracking. Active sonar, by contrast, emits pulses and listens for returning echoes, providing rapid range and bearing data but compromising the emitting platform's stealth.

Fixed long-range sonar systems can exploit the ocean's deep sound channels. The Cold War SOSUS network deployed seabed hydrophone arrays and shore-based processing to detect and track nuclear submarines across ocean basins, most famously in the Greenland, Iceland, UK (GIUK) Gap. Modern cabled seabed arrays remain highly effective for strategic surveillance at chokepoints and transit lanes. Multi-static networks - where one platform emits a signal while others listen for the return - create larger detection footprints and complicate adversary stealth measures. Maritime patrol aircraft and ship-borne helicopters provide timely response options and considerably extend ASW reach, deploying sonobuoy fields and dipping sonars to localise contacts.

As submarines have become progressively quieter, non-acoustic techniques have attracted growing operational and research interest. Magnetic Anomaly Detection (MAD) senses tiny perturbations in Earth's magnetic field caused by a submarine's ferrous hull and is used from low-flying aircraft and helicopters to localise targets once acoustic cues have narrowed the search area. Synthetic Aperture Radar (SAR) together with electro-optical and infrared sensors can detect surface wakes, thermal anomalies, and internal wave signatures generated by submerged vessels under favourable conditions, providing valuable cueing for ASW assets. Light Detection and Ranging (LIDAR) can detect subsurface scattering in clear, shallow littoral waters, though its utility diminishes rapidly with depth and turbidity.²⁰

Experimental approaches including quantum gravimeters and hypersensitive electromagnetic field sensors aim to detect a submarine's mass or electrical disturbance directly, though these remain technically challenging.²¹

No single technology is decisive. Environmental variability, including temperature layers, salinity gradients, and seabed type, degrades sensor performance, while submarine countermeasures such as anechoic coatings, low-noise

propulsion, decoys, and wake management further complicate detection. The future for ASW lies in the continued fusion of acoustic and non-acoustic sensors, expanded seabed networks, widespread deployment of autonomous platforms, and pervasive AI for signal processing and sensor tasking. Advances in machine learning and adaptive beamforming have already transformed sonar utility, enabling automated classification, multi-sensor data correlation, and management of large, distributed sensor datasets.²² Uncrewed surface vessels, autonomous underwater vehicles, and unattended seabed sensors are increasingly valuable force multipliers, enabling persistent wide-area surveillance without the constraints of scarce manned platforms. In sum, submarine detection is evolving from platform-centric sonar hunts into an integrated, multi-domain enterprise in which layered acoustic arrays, airborne and spaceborne cueing, autonomous patrols, and advanced processing work together to erode the traditional advantages of stealthy undersea platforms.

Maritime Geography and Submarine Transit Routes

For Australia and India, the strategic significance of submarine surveillance is inseparable from geography. As Chinese submarines move operations further afield, including into the Indian Ocean, they must pass through a limited number of transit corridors, and effective surveillance architectures must be oriented around these geographic bottlenecks.²³

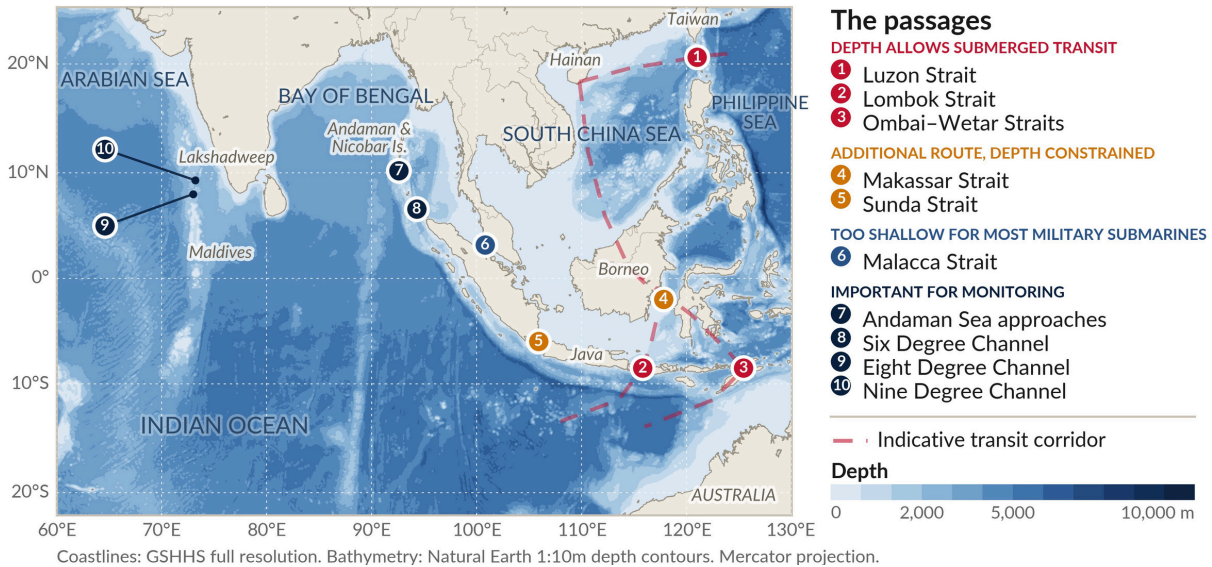
The South China Sea serves as both bastion and gateway for Chinese submarine operations. Submarines departing Hainan Island primarily exit into the Western Pacific through the Luzon Strait, the deep-water passage between Taiwan and the Philippines, which is the preferred route for submerged nuclear-powered attack submarines (SSNs) and nuclear-powered ballistic missile submarines (SSBNs) transits into the Philippine Sea and beyond.

For any submarine seeking access to the Indian Ocean from Asia, the Indonesian archipelago presents a critical set of transit chokepoints.²⁴ Of these, the Lombok Strait and the Ombai-Wetar Straits are the most strategically significant, as their depth profiles allow SSNs and SSBNs to transit submerged. The Makassar Strait and Sunda Strait offer additional routes, though with varying depth constraints. The Malacca Strait, though the most commercially dense and politically sensitive waterway in the region, is too shallow for most military submarines to transit submerged, making it largely irrelevant as a submarine corridor despite its enormous strategic significance for surface traffic.

Once into the Indian Ocean, submarines face a further set of chokepoints relevant to both transit and operational deployment. The Andaman Sea approaches and the Six and Eight/Nine Degree Channels in the central Indian Ocean are important for monitoring submarines moving between the Bay of Bengal and the broader ocean basin.

The implication for Australia-India surveillance cooperation is that the monitoring of submarine activity in the Indian Ocean must begin well forward of Indian Ocean entry points, particularly at Indonesia's deep-water straits. A layered surveillance approach combining fixed seabed sensors at key chokepoints, mobile autonomous assets, and maritime patrol aircraft operating from both Australian and Indian bases offers the most viable means of generating persistent, decision-grade awareness across this extended geographic space.

Submarines reaching the Indian Ocean must use a handful of deep passages



PLA-N Submarine Capabilities

China operates a modest but growing nuclear submarine force alongside a large conventional fleet. Open estimates put China's operational SSBN fleet at six Jin-class (Type 094) boats, which form the sea-based leg of Beijing's nuclear deterrent. The PLA-N also operates 10 SSNs, with another three in reserve, along with 46 conventional submarines, 20 of which are equipped with Air Independent Propulsion (AIP).²⁵

China's key modernisation and future submarine programs include the Type 095 (also known as the 09V) SSN and the Type 096 SSBN, although exact details around plans and timing remain unclear.²⁶ Recent imagery and reporting indicate the first Type 095 hulls are in advanced outfitting at the Bohai Shipyard in Liaoning province,²⁷ signalling imminent sea trials.

Faster construction, modern SSN/SSBN designs, and improved quieting are shifting the undersea balance in the Indo-Pacific. That trend complicates anti-submarine warfare for regional navies, expands China's power-projection envelope (including into the Indian Ocean), and increases the strategic value of sea-based deterrence. However, numbers alone understate the issue; experience, quality (quieting, sensors, weapons, crews), and operational patterns (remote patrols, dispersed basing) together define true capability.

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Australian Current ASW Capabilities and Programs

Australia's anti-submarine warfare capabilities form a core component of Australia's maritime defence posture in the Indo-Pacific. The RAN's ASW capability is achieved through an integrated mix of submarines, surface combatants with embarked helicopters, and RAAF operated P-8A Poseidon Maritime Patrol and Response Aircraft (MPRA).

Australia's six Collins-class submarines remain significant ASW platforms and, while aging, remain among the most capable conventional submarines in the world.²⁸ Under the AUKUS program, Australia will transition to a nuclear-powered, conventionally armed submarine force in a staged program, commencing with the long-term basing of allied SSNs at HMAS *Stirling* from 2027, Australia's acquisition of several (expected to be between 3-5) US Navy Virginia Class submarines from the early 2030s and the construction (in Adelaide) of the SSN-AUKUS class with delivery commencing in the 2040s.²⁹

This program is expensive (estimates range up to A\$368 Bn³⁰), but the fact that two successive Australian governments—from opposite sides of politics—have committed to Australia's acquisition of SSNs is indicative of the challenges foreseen in Australia's maritime domain. Foremost amongst these is the threat posed by adversary submarines, which have the potential to undermine Australia's economic prosperity and security.

Australia's primary surface ASW platforms are the three Hobart-class destroyers, with hull-mounted sonar, a towed array, torpedo launchers and an embarked MH-60R Seahawk helicopter, along with its fleet of seven ANZAC-class frigates, equipped with hull-mounted sonar and torpedo launchers and also capable of embarking MH-60R helicopters. The forthcoming Hunter-class frigates - based on the British Type 26 Global Combat Ship with significant Australian modifications including the US Aegis combat system, the CEAFA2 phased array radar, and modified aviation facilities to support the MH-60R - were selected specifically to meet Australia's requirement for a dedicated ASW surface combatant.



*A Collins-Class submarine heading out to sea from Fleet Base West, shadowed by an MH-60R Seahawk helicopter during ASWEX 25. This image has been digitally manipulated for security requirements.
Source: Royal Australian Navy*

The Hunter-class will be equipped with the S2150 hull-mounted sonar, the S2087 towed array and variable depth sonar, along with an anti-ship torpedo defence system. It will carry both the MU90 surface-launched torpedo system and the Mark 54 air-launched torpedoes for the embarked helicopter.³¹

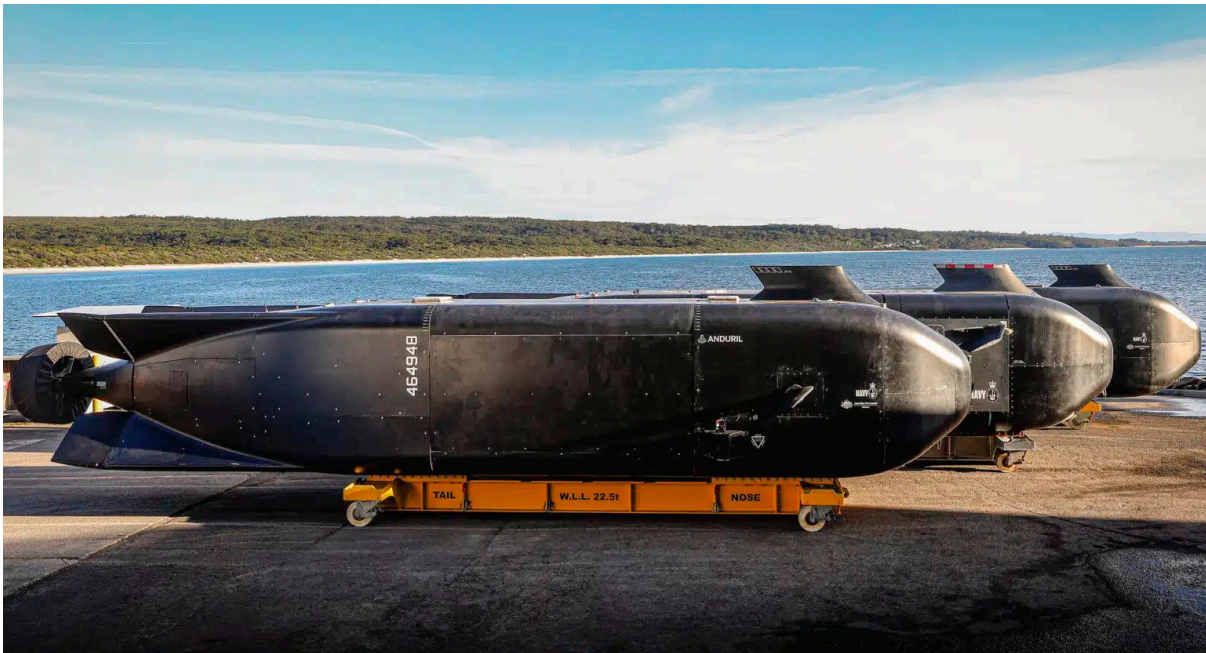
Nine ships were originally ordered, but a subsequent surface combatant review reduced this to six while recommending the acquisition of up to eleven general-purpose frigates,³² with the enhanced Mogami-class frigate selected in August 2025.³³ The Mogami frigates will also carry hull-mounted and towed sonar systems and embark an MH-60R helicopter.

Australia has also explored the acquisition of the US Surveillance Towed Array Sensor System – Expeditionary (SURTASS-E), the release of which was approved by the US State Department in 2023,³⁴ though further progress has not been publicly announced³⁵ and there is no mention of this capability on Australia’s 2026 National Defence Strategy, indicating procurement is unlikely to proceed in the short term.

Australia's airborne ASW capability centres on 14 Boeing P-8A Poseidon MPRA operating from RAAF Base Edinburgh in South Australia. The P-8A carries sonobuoys, magnetic anomaly detection systems, acoustic processing suites, and air-launched torpedoes, and is compatible with aerial refuelling from RAAF KC-30A tankers. Australia's P-8A fleet is undergoing a four-year (2025-29) upgrade program designed to improve processing power, communications, detection performance, and targeting capability.³⁶

A critical contributor to Australia's shipborne ASW is the MH-60R Seahawk helicopter, which combines radar, dipping sonar, sonobuoy deployment, Electronic warfare sensors and Magnetic Anomaly Detection (MAD) into a highly reactive aircraft optimised for ASW. Australia's Seahawks carry the Mk 54 lightweight torpedo and can also fire the AGM-114 Hellfire air-to-surface missile. The RAN operates 23 of these helicopters, with an additional 13 on order, giving the navy the ability to project ASW sensors and weapons far beyond a ship's immediate vicinity.³⁷

Australia's most distinctive emerging capability is in autonomous undersea systems, with the RAN reportedly investing between A\$5.2 and A\$7.2 billion on developing and acquiring a range of subsea warfare capabilities and uncrewed systems over the next decade.³⁸ Three uncrewed systems supporting the undersea domain are in various stages of development.



The Ghost Shark XL-AUV is Australia's most distinctive emerging capability. Pictured here are three Anduril Ghost Shark prototypes developed for the Australian Navy.
Source: Anduril

The Ghost Shark Extra-Large Autonomous Undersea Vehicle (XL-AUV) was developed in conjunction with Anduril, and is designed to conduct intelligence, surveillance, reconnaissance and strike operations covertly and at long range.³⁹ While specific details have yet to be publicly released, Ghost Shark is based on Anduril's commercial "Dive-XL" vehicle, indicating it is approximately 12 metres in length, displaces under 100 tonnes, and has a range exceeding 3,000 km.⁴⁰ Anduril was awarded a A\$1.7 billion five-year production contract in September 2025, reportedly for "dozens" of Ghost Shark vehicles, although the exact number has not been released.⁴¹

Complementing the emerging Ghost Shark capability, the RAN has also invested in the Speartooth Large UUV, manufactured by Australia's C2 Robotics.⁴² Like Ghost Shark, its performance capabilities and payloads have not been made public. However, it is similar in shape and size to a heavyweight torpedo, so it is reasonable to assume that a range of sonar, communications and intelligence payloads could be deployed.

The third uncrewed capability the RAN is introducing is the Blue Bottle Autonomous Surface Vessel, built by Ocious in Sydney and powered by wind, solar, and wave energy. Blue Bottle provides persistent surface-layer ISR support to both crewed and uncrewed undersea systems, including as a communications relay.⁴³ The platform can deploy a range of sensors and conceptually could work in conjunction with both Ghost Shark and Speartooth.⁴⁴ In March 2026, the Australian government announced plans to expand Australia's Blue Bottle fleet to 55 units, making it one of the world's largest sovereign USV fleets.⁴⁵

These programmes collectively position Australia at the leading edge of uncrewed and autonomous undersea warfare capability among regional navies.

Current Indian Capabilities and Programs

The Indian Navy's ASW capabilities form a critical pillar of its maritime defence strategy, aimed at detecting, tracking and, if necessary, neutralising undersea threats in the IOR and along India's extensive coastline. This capability is built around surface combatants, airborne platforms and dedicated ASW vessels, integrated with advanced sensors and weapons.

The Indian Navy operates a number of dedicated ASW surface combatants and corvettes. The primary among these are the Kamorta-class ASW corvettes, which are purpose-built with hull-mounted sonar, torpedo tubes, rocket launchers and the ability to operate shipborne helicopters. Four Kamorta-class corvettes are in service, providing deep-water ASW coverage.⁴⁶

To address littoral or shallow-water submarine threats, the Navy is commissioning Anti-Submarine Warfare Shallow Water Craft (ASW-SWC). These specialised vessels are expressly configured to detect and engage submarines in near-shore waters, where acoustic conditions make traditional ASW more challenging. A total of 16 such ASW-SWCs are being built under India's 'Make in India' initiative, with several already delivered.⁴⁷ These ships carry lightweight torpedoes, rocket launchers and advanced sonar suites tailored for undersea surveillance and attack.

In addition to these dedicated ASW ships, many of India's stealth frigates and destroyers incorporate robust ASW sensors, torpedo launchers and helicopter decks, enabling them to perform multi-role tasks in fleet operations.

Airborne assets dramatically extend the Indian Navy's ASW reach, allowing detection and prosecution of submarines far beyond surface ship horizons. Central to this is the fleet of Boeing P-8I Neptune maritime patrol aircraft, a variant of the US Navy's P-8A. India currently operates 12 P-8I aircraft (with potential expansion plans), based on the East and West Coasts.⁴⁸ These long-range aircraft carry sensors, sonobuoys, magnetic anomaly detectors and torpedoes, enabling wide-area submarine hunting, anti-surface warfare and maritime domain surveillance.

Complementing fixed-wing aircraft is the growing fleet of MH-60R Seahawk multi-role helicopters. These advanced ship-borne helicopters are equipped with dipping sonar, sonobuoys, and torpedoes to prosecute undersea contacts from frigates, corvettes, and other vessels. Plans are underway to procure up to 24 MH-60R helicopters, significantly enhancing airborne ASW reach and responsiveness.⁴⁹



*Indian Navy's P-8I Neptune, core of India's long-range airborne search capability.
Source: Boeing*

By combining dedicated ASW corvettes, advanced patrol aircraft, ship-borne helicopters and modern sensors, the Indian Navy has developed an increasingly layered ASW capability. This enables persistent undersea surveillance, rapid response to submarine incursions and enhanced maritime domain awareness throughout the Indian Ocean.

Comparative strengths and gaps between IN and RAN

India's ASW posture emphasises long-range airborne search with growing shipborne and shallow-water assets. The Indian Navy's strength lies in its P-8I Neptune fleet and increasing numbers of specialised littoral ASW vessels (Kamorta-class corvettes and ASW-SWC), which give India a persistent surveillance capability over key chokepoints in the northern Indian Ocean and good coverage of its coastline. India also benefits from extensive geographic proximity to the IOR's most strategically sensitive areas, including the Andaman Sea, the Bay of Bengal, and the approaches to the Malacca Strait, which collectively carry the bulk of the region's maritime trade. The Indian Navy's longstanding operational presence in these waters, supported by forward basing at the Andaman and Nicobar Command, provides a depth of environmental knowledge and operational familiarity with the regional undersea domain that no other navy can match.

India's surface assets are increasingly being fitted with hull-mounted sonars, towed arrays and lightweight torpedoes, while MH-60R helicopter procurements will further improve ship-launched ASW reach.

Australia's ASW strengths derive from modern platforms - surface ships, aircraft and increasingly a range of autonomous systems - integrated into a networked maritime picture. The Australian Defence Force's emphasis on high-quality sensors, interoperability with allied forces, and investment in autonomous undersea vehicles expands persistent detection and prosecution options beyond conventional ship-air capabilities.

The P-8I (India) and P-8A (Australia) aircraft are both derivatives of the same airframe, with core ASW roles executed using sonobuoys, onboard acoustic processing, and torpedoes. The P-8I is a bespoke export variant with specific Indian communications, datalink, and sensor fits; Australia's P-8A adheres to NATO/US interoperability standards and benefits from incremental US Navy upgrades. The two platforms have compatible satellite and radio communications, use Link 16 for the sharing of tactical tracks during exercises, and share a common acoustic processing architecture with specific national customisation. The mission systems of both aircraft, however, remain strictly national. Acoustic processing chains, sonobuoy management, classifier algorithms, electronic warfare libraries, and cryptographic systems are not shared. This is a deliberate design choice that preserves sovereignty and protects sensitive national capabilities. The practical implication is that P-8 interoperability supports cooperation at the decision layer rather than at the sensor layer.

**The mission systems of both aircraft, however, remain strictly national. ...
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at the decision layer rather than at the sensor layer.**

In sum, India leans on expanded airborne coverage and indigenous shallow-water craft, while Australia focuses on platform quality and allied interoperability that networks high-end sensors with autonomous systems. These differences are complementary rather than competitive.

Bilateral initiatives between India and Australia

Australia and India approach security cooperation from different strategic traditions. Australia operates within a formal alliance framework with the United States and has committed to AUKUS, whereas India prioritises strategic autonomy and calibrated alignment.⁵⁰ Nevertheless, India and Australia have steadily expanded naval training and operational cooperation over the past decade, driven by shared concerns about maritime security, freedom of navigation, and increasing undersea and surface activity in the Indo-Pacific. This cooperation is anchored in high-end bilateral and multilateral exercises, most notably AUSINDEX (bilateral) and Exercise MALABAR (multilateral), which together build interoperability, tactical alignment, and strategic signalling.

Formal Australia-India bilateral and military cooperation was advanced with the Framework of Security Cooperation (FSC) in 2014, which includes regular Defence Ministers' meetings and annual Defence Policy Talks.⁵¹ The FSC established the framework for a relationship that has since grown considerably in ambition and complexity, creating regular channels at the ministerial, official, and service levels that allow both sides to manage the relationship proactively. The inaugural October 2025 Defence Ministers' Dialogue⁵² was a significant marker of the relationship's progress, with both sides agreeing to deepen cooperation across a range of areas, including undersea warfare and maritime domain awareness.

In 2015, India hosted the first AUSINDEX, a bilateral exercise held every two years, which has evolved to be the flagship bilateral naval exercise between the Indian Navy and the RAN. AUSINDEX has steadily evolved from basic passage drills to increasingly sophisticated warfighting training involving multi-ship task groups, helicopters, and maritime patrol aircraft. AUSINDEX focuses on complex maritime warfare areas, including ASW, air defence, and surface warfare.

Over successive iterations, AUSINDEX has increasingly highlighted ASW cooperation, reflecting the growing strategic importance of submarine detection, tracking and information sharing in the region and the consequent deterrent effect this greater cooperation achieves.

A key feature of AUSINDEX is its emphasis on professional integration and tactical learning, allowing both navies to practice real-time communications, shared operating procedures, and command-and-control coordination. It also supports greater familiarity with each other's platforms and doctrines. Over successive iterations, AUSINDEX has increasingly highlighted ASW cooperation, reflecting the growing strategic importance of submarine detection, tracking and information sharing in the region⁵³ and the consequent deterrent effect this greater cooperation achieves.

Exercise MALABAR began as an India-US naval initiative but has expanded into a major multilateral exercise involving India, the United States, Japan, and Australia. Australia's inclusion as a permanent participant since 2020 has made MALABAR one of the most strategically significant naval exercises in the Indo-Pacific, often viewed as the premier operational expression of Quad maritime cooperation.



HMAS Ballarat conducts a seamanship evolution with Indian Navy Shivalik-class frigate, INS Sahyadri, during AUSINDEX 25.
Source: Royal Australian Navy

MALABAR includes advanced training in carrier operations, maritime strike, air defence, ASW, cross-deck helicopter operations, and complex multi-domain warfare scenarios.⁵⁴ For India and Australia, MALABAR provides a valuable platform to integrate not only bilaterally but also within a wider coalition framework, ensuring interoperability with US and Japanese naval forces. The exercise strengthens combined operational capability, particularly in areas such as tactical datalink integration, coordinated ASW prosecution, and large-scale task force manoeuvring.

Together, AUSINDEX and MALABAR provide complementary benefits. AUSINDEX deepens bilateral trust and procedural familiarity, and builds tactical coordination between India and Australia, while MALABAR enhances coalition readiness in a complex maritime environment. These exercises contribute to shared maritime domain awareness, improve crisis-response coordination, and reinforce deterrence by demonstrating that India and Australia can operate together effectively across the Indo-Pacific.

Together, AUSINDEX and MALABAR provide complementary benefits. AUSINDEX deepens bilateral trust and procedural familiarity, and builds tactical coordination between India and Australia, while MALABAR enhances coalition readiness in a complex maritime environment.

Other Partners

While the focus of this report is on Australia-India cooperation, the reality is that effective coordination of ASW efforts across the IOR will involve several other nations with interests in Indian Ocean maritime security.

The United States is the critical enabling partner for both navies and cannot be disaggregated from any realistic assessment of bilateral ASW cooperation. Through AUKUS, the United States is influencing Australia's future submarine force in ways that will transform the operational reach and effectiveness of Australia's submarine and ASW capabilities. US and British SSNs will cycle through HMAS Stirling from 2027, with Australian-flagged Virginia-class submarines based from the early 2030s.

For India, the United States is an increasingly important defence partner and the architect of the broader Indo-Pacific security architecture within which Indian maritime strategy operates. Managing the interface between US-enabled Australian capabilities and India's desire for strategic autonomy will be a recurring feature of the bilateral relationship, requiring active management.

Japan is also an increasingly important trilateral partner with vital energy SLOCs across the Indian Ocean that are critical to Japan's security. Japan's ASW capability—centred on its P-1 maritime patrol aircraft, 24 conventional submarines, and advanced surface combatants—is among the most capable in the region, and the MALABAR exercise framework provides a natural vehicle for ASW coordination. The selection of the Japanese Mogami-class for Australia's general-purpose frigate requirement creates a direct platform link with the Japan Maritime Self-Defence Force, which may facilitate future technical interoperability.

France, while less central, also maintains a significant Indo-Pacific presence and is engaged with both Australia and India in a range of defence cooperative initiatives, although it does not currently have any substantial ASW capabilities based in the region.

Finally, engagement with Indonesia, whose archipelago Chinese submarines must transit to enter the Indian Ocean (short of transiting south of Australia), should be viewed as an emerging ASW partner for both Australia and India. Indonesian authorities have recognised that foreign submarines often travel through their waters without warning⁵⁵ and have announced plans to increase the use of drones and “unmanned submarines” in their maritime patrol missions.⁵⁶

STRATEGIC AND OPERATIONAL CHALLENGES

The key challenge to greater India-Australia cooperation in ASW is not technical, but legitimate security concerns. Submarine operations are among the most sensitive national activities that governments undertake. The methods, technologies, strengths, and weaknesses of a navy's undersea surveillance capability are precisely the information that an adversary most wants to know and that classification regimes are designed to protect. These are real and legitimate concerns in both countries.

The key challenge to greater India-Australia cooperation in ASW is not technical, but legitimate security concerns. ... The methods, technologies, strengths, and weaknesses of a navy's undersea surveillance capability are precisely the information that an adversary most wants to know and that classification regimes are designed to protect.

This security challenge is compounded by differences in the way both countries view the emerging threat. Australia and India are both concerned about increased Chinese submarine activity in the IOR, but the character of those concerns differs in ways that matter operationally. For India, Chinese submarines in the IOR pose a challenge to regional primacy and a potential coercive instrument in the broader Sino-Indian strategic competition that spans land border disputes, trade, and nuclear power balances. For Australia, the concern has historically been more narrowly maritime: the protection of sea lines of communication, the preservation of the rules-based maritime order, and the capacity of adversary submarines to exercise sea denial in Australia's approaches, although the July 2026 Chinese submarine-launched ballistic missile test firing into the Pacific Ocean has broadened the submarine threat to Australia significantly.⁵⁷ These divergent framings lead to different operational priorities, different risk tolerances, and different instincts about when and how information should be shared.

India's concept of strategic autonomy creates further structural complexity. India has declined to join formal alliances, including the US-centred security architecture to which Australia is firmly committed. India's longstanding defence relationship with Russia, which remains a significant supplier of defence equipment and a legacy partner in submarine technology, creates specific sensitivities around intelligence sharing, particularly given Australia's membership in the Five Eyes intelligence community and its obligations under AUKUS. Australia, operating within the Five Eyes architecture, applies information-handling procedures and security standards that are not readily extended to non-Five Eyes partners.

These realities must be recognised and appreciated by both sides; however, they should not hinder efforts to cooperate and share information where it makes mutual sense to do so. Indeed, if a crisis escalates or conflict erupts against a common threat, the flow of information between countries will likely increase as risk appetites immediately rise and peacetime bureaucratic inertia reduces, so it is logical to have systems and processes in place, even if the level of information being transferred is low prior to conflict.

While security constraints are real, the challenge is to distinguish between genuinely sensitive restrictions and merely habitual, bureaucratic ones that are a function of historical practice and unnecessary risk aversion. A concrete example illustrates the point. Oceanographic data, such as bathymetric information, water temperature, and salinity profiles, are routinely collected by naval vessels and are directly relevant to ASW performance prediction. Historically, this data was classified because the position of the collecting vessel was included in the metadata, and that positional information was considered sensitive. Given the capabilities of modern wide-area surveillance systems such as satellites, AIS, and coastal radar networks, the positional information of surface ships is often now far less sensitive than it once was. Yet classification restrictions on the underlying oceanographic data often remain in place, sometimes a product of institutional inertia rather than contemporary threat analysis. A deliberate bi-national review of information-sharing thresholds, focused on identifying categories of data whose release restrictions are no longer warranted, would deliver immediate operational benefits and model the kind of trust-building that is the prerequisite for deeper cooperation. It would also institutionalise the flow of information between the two countries using relatively benign information.

While security constraints are real, the challenge is to distinguish between genuinely sensitive restrictions and merely habitual, bureaucratic ones that are a function of historical practice and unnecessary risk aversion.

Industry and Technology Cooperation

Industry engagement presents a separate institutional challenge. The translation of exercise experience into industrial cooperation, such as the joint development of autonomous undersea systems, co-production of sonobuoys, or sharing of acoustic processing methodologies, requires a commercial and intellectual property framework that has not yet been developed. Australia's frontier position in autonomous undersea systems, together with India's vast experience in software development, represents genuine comparative advantages in both countries that could

anchor a deeper industrial relationship, but the interface between Australian industry and India's Make in India framework remains underdeveloped relative to the strategic potential.

Financial Challenges

Resource allocation presents another strategic challenge. Australia's AUKUS commitment is projected to cost up to A\$368 billion (including contingency funding) over the life of the program. While Australia's 2026 Integrated Investment Program allocates 41% of the planned investment to maritime capabilities (with 17% to land and 14% to air),⁵⁸ a significant percentage of this is allocated to the SSN procurement. Without supplementary funding, this represents a large proportion of the Defence capital budget, potentially creating pressure on the surface combatant, autonomous systems, and MPA programs most directly relevant to bilateral ASW cooperation.

India also manages an expansive force modernisation programme spanning submarine procurement, carrier aviation, surface combatant replacement, and the ASW-SWC program, with competing priorities across the armed services. There is a real risk that bilateral cooperation is treated as a discretionary option rather than a core investment, resulting in under-resourced coordination mechanisms, inadequate follow-through, and institutional relationships that form the foundation of operational trust not being sustainably developed.

OPPORTUNITIES FOR ENHANCED COOPERATION

The preceding analysis has introduced a range of opportunities for Australia and India to deepen their collaboration in undersea surveillance and anti-submarine warfare. This section draws those threads together and organises them into a practical framework for action, structured around three planning horizons: near-term initiatives achievable within one to three years; medium-term capability development programmes spanning three to five years; and long-term structural investments that will see benefits beyond the five-year horizon. Across all three timeframes, the chapter integrates both the practical opportunities for enhanced cooperation and the specific policy recommendations required to realise them.

The overarching argument of this chapter is that the foundations for a genuinely capable bilateral undersea surveillance partnership already exist. Both nations operate the P-8 maritime patrol aircraft, share concerns about the expanding reach and presence of submarines in the Indian Ocean, and have sustained a pattern of increasingly complex exercises under the AUSINDEX series and participation in MALABAR. However, the coordination between the two countries has been largely ad hoc, built around planned exercise programs. What is lacking is the institutional architecture to enable real-time coordination as operational circumstances dictate, including standing communication channels, shared procedures, common environmental databases, and reciprocal access arrangements. The recommendations below are calibrated to close that gap incrementally, beginning with the steps that generate the greatest return for the lowest political and technical investment, and building progressively toward the more ambitious cooperative infrastructure that a mature strategic partnership ultimately requires.

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Near-Term Initiatives (One to Three Years)

The most consequential near-term investment both navies can make requires no new platforms, treaty-level agreements or technology transfer. Instead, it requires a deliberate decision to institutionalise the relationships between their operational-level maritime headquarters. While Australia and India have increased the tempo and complexity of tactical ASW training over the past decade, linkages between their respective operational planning staffs are built around exercise schedules. There is significant scope to build an enduring relationship between ASW operational command staffs in both countries, one in which increased information about each other's activities is shared where possible, and coordinated responses to third-party submarine activity (primarily Chinese) in the Indian Ocean can be executed routinely. In short, coordination should move beyond scheduled exercise planning to ongoing, real-world operational engagement.

The rationale for prioritising this structural investment is captured in a remark made by Australia's Chief of Navy, Vice Admiral Mark Hammond, in 2025: 'You can't surge trust. You either have it because you worked for it before you needed it, or you don't.'⁵⁹ Given the generally sporadic and ad hoc nature of coordination between the operational-level naval commands in Australia and India, there is significant scope to strengthen personal relationships and institutional familiarity by embedding routine communication and coordination as a standing feature of the bilateral relationship rather than being an exercise-period artefact. This is arguably the highest-value, lowest-cost initiative available to both governments in the near term.

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In practice, this means both governments should formally establish a standing bilateral coordination protocol linking the Indian Navy's operational command with Australia's Joint Operations Command. The mandate should focus on submarine track correlation within security constraints and surveillance deconfliction (progressing to coordination) across the eastern Indian Ocean. Standing doctrine and operating procedures should be designed to enable rapid escalation to near-real-time information sharing in a crisis. Staff should be empowered to share agreed information, at an appropriate classification level, without requiring case-by-case authorisation from above. Of course, the detailed tactical information that can be exchanged between the two navies will likely remain limited in peacetime, but significant gains can be realised simply by establishing and normalising the channels of communication and methods of information flow.

To help solidify this initiative, both sides should also be willing to accept a greater degree of risk by sharing less-sensitive information that has historically been restricted but, given contemporary surveillance capabilities, may no longer warrant restriction. The example of the exchange of oceanographic data discussed previously is germane. There is a strong case for a conscious review of this category of information (and similar datasets) by both countries to determine whether the benefits of routine sharing between India and Australia now outweigh the residual security concerns. Where sharing is deemed mutually beneficial, automated data exchange protocols should be established. The operational dividend would be a progressively richer shared understanding of the physical acoustic environment across the key surveillance corridors of the eastern Indian Ocean; an understanding that is the practical foundation of effective joint ASW operations.

The near term also offers a practical and visible opportunity that both governments should move quickly to exploit. During the inaugural Defence Ministers' Dialogue between Australia and India in October 2025, Australia issued an invitation for India to participate in the next Exercise BLACK CARILLION.⁶⁰ BLACK CARILLION is a periodic submarine search and rescue exercise held to certify Australia's submarine rescue capability and to train crews in practical submarine rescue scenarios. The recent commissioning of two Nistar-class Diving Support Vessels into the Indian Navy⁶¹—each displacing over 9,000 tonnes and carrying two Deep Submergence Rescue Vehicles capable of operating to 650 metres⁶²—makes Indian participation in BLACK CARILLION both operationally meaningful and logistically feasible. This initiative is significant not merely as a rescue training event but also as a vehicle for building professional relationships among submarine communities; relationships that serve as the foundation for broader ASW cooperation. Submarine rescue is one of the few areas of undersea warfare where most submarine-operating nations cooperate openly, making it an ideal activity to build the personal trust and procedural familiarity between Australian and Indian operational planners that more sensitive cooperation will eventually require. The October 2025 invitation should be converted into a confirmed program commitment.

Parallel to these institutional initiatives, both navies should pursue a bilateral executive-level agreement that establishes agreed-upon patrol-zone responsibilities, cross-cueing protocols, and communications procedures for Indian and Australian maritime patrol aircraft operating in overlapping surveillance areas. India's P-8I and Australia's P-8A are individually formidable ASW platforms, so the ability to coordinate them into a coherent, complementary surveillance system would represent a significant advance in bilateral capability at no additional platform cost.

ASW surveillance sensors become considerably more valuable when linked to rapid-response airborne ASW assets that provide response options. For example, in a chokepoint scenario, a seabed sensor detecting a submarine can cue a P-8 to deploy sonobuoys, confirm the contact, and maintain custody until handed over to a relieving aircraft or ship. This is the essence of modern ASW, with a range of different sensors, fused with AI tools to assist in analysing the data from each, to build a coherent subsurface picture, rather than single-platform hunting and then prosecuting a submarine.

The P-8A/P-8I pairing is the most immediately available expression of this type of cooperation for Australia and India. The airfield investments Australia is making on Cocos Island,⁶³ together with existing bases at Darwin and

Learmonth, the facilities on Christmas Island, and Indian facilities in the Nicobar Islands, already create the geographic conditions for complementary patrol coverage. The missing element is the coordination architecture, which can be built within the near-term horizon through a combination of bilateral executive agreements, exercise refinement under successive AUSINDEX iterations, and the progressive development of combined standard operating procedures. In particular, both militaries should develop common SOPs covering prosecution thresholds, multi-ship tracking protocols, lost-contact reacquisition drills, and handover procedures between P-8A and P-8I aircraft. These should be exercised regularly during AUSINDEX and MALABAR exercises and reviewed annually to reflect evolving operational experience. The objective is to eliminate procedural incompatibility as a source of delay in coordinated ASW operations, which will increasingly need to be executed within very short timeframes.

The airfield investments Australia is making on Cocos Island, together with existing bases at Darwin and Learmonth, the facilities on Christmas Island, and Indian facilities in the Nicobar Islands, already create the geographic conditions for complementary patrol coverage. ... The missing element is the coordination architecture, which can be built within the near-term horizon

Importantly, while the focus of this report is on Australia-India cooperation, as coordinated surveillance initiatives evolve, they should include the US, Japan (as QUAD members), the UK and potentially France to maximise collective efforts and avoid duplication.

The short term should also see both governments facilitate a structured industry dialogue between Australian defence industry and the Indian defence industry and research organisations. The objective should be identifying opportunities for co-development, complementary development, or co-production of autonomous undersea surveillance systems. A joint demonstration program, potentially integrated into AUSINDEX and MALABAR, would accelerate mutual understanding of autonomous system capabilities and build the operational familiarity needed for effective joint deployment.

Medium-Term Capability Development (Three to Five Years)

The medium term is the horizon at which the institutional relationships built in the near term can begin to generate tangible capability dividends, as both navies invest in complementary systems and develop the shared operational frameworks to employ them jointly. The central challenge of this period is moving from coordination—exchanging

information and deconflicting operations—towards integration, in which each nation's platforms and employment profiles are consciously designed to contribute to a shared surveillance picture rather than merely a national one. There will, of course, be limits to what can be achieved, as India will retain a desire for strategic autonomy and non-alignment, while Australia will likely prioritise interoperability with the United States, but where information exchange is permitted, both navies should seek to proactively do so as a matter of routine and consider this requirement at the system design stage.

The most strategically significant medium-term investment is the development of a coordinated undersea surveillance infrastructure across the key approaches to the Indian Ocean. Modern submarines have progressively reduced the acoustic signatures that passive hydrophone arrays were designed to exploit. Fixed active sonar nodes, often arranged in multi-static configurations, offer substantially improved detection by denying submarines the ability to optimise their acoustic profile against a single geometry simultaneously. Such systems enable better detection at medium ranges and more accurate localisation than passive arrays alone, and they perform particularly well in chokepoint environments. The Lombok Strait, Sunda Strait, Ombai-Wetar passages, and the Andaman Sea approaches represent the priority locations for such investment, though this would require active engagement with Indonesia and, in the case of the Luzon Strait, the Philippines. This represents a diplomatic dimension that must be managed carefully and will be addressed below.

Alongside active sonar nodes, the medium term should see both navies invest in distributed unattended seabed sensor networks as a complement to, and in some cases a replacement for, traditional cable-connected hydrophone arrays. Compact, battery-powered systems that incorporate passive hydrophones, magnetic anomaly detectors, pressure sensors, and acoustic event recorders can be deployed from a submarine, surface ship, or autonomous underwater vehicle and can remain on station for extended periods. Their principal advantage over cable-based systems is that they do not require the sustained logistic chain and shore infrastructure that make large, fixed arrays politically and practically demanding. Their limitations, such as battery life, limited communication bandwidth, and the need for periodic servicing or retrieval, mean they are best employed for targeted monitoring of specific chokepoints during periods of heightened concern rather than for permanent wide-area coverage. India and Australia could jointly develop deployable seabed sensor kits that can be surged to high-priority locations as circumstances require, with procedures for rapid deployment embedded in the combined standard operating procedures developed during the near-term phase.

Both nations should simultaneously invest in building a shared understanding of the acoustic environment across key surveillance areas such as the Indonesian passages, the Andaman Sea approaches, and the eastern Bay of Bengal. The performance of every sensor system in the inventory is conditioned by the local acoustic environment. Factors like temperature and salinity gradients, background noise levels, bottom topography, and seasonal variation all affect the range and reliability of sensors. A coordinated program for oceanographic and acoustic data collection, using P-8 patrols, surface ship deployments, and AUV gliders, would simultaneously improve sonar performance prediction and tactical planning for both nations and could be progressed with extant operations and deployments. This initiative builds directly on the near-term data-sharing framework, expanding it from the exchange of existing data to the

coordinated joint collection of new data in support of shared operational requirements. While there will be elements of oceanographic data that cannot be shared for security reasons, these should be by exception rather than the default, and this type of information should be included in the cost-benefit review of shared data discussed earlier.

Autonomous systems deserve particular attention in the medium-term horizon. Autonomous underwater vehicles (AUVs) and ocean gliders are increasingly central to undersea surveillance because they offer a combination of stealth, endurance, and affordability (and hence mass) to complement crewed systems. Gliders, with endurance measured in weeks to months, are particularly well suited to persistent monitoring of chokepoints through which submarines must transit. Faster AUVs, capable of manoeuvring and carrying larger sensor suites, complement gliders in providing wide-area coverage.

The volume of data generated by modern ASW systems creates its own challenge, however. Human operators alone cannot process it at the pace required for operational utility. Both governments should therefore invest in AI-enabled processing capabilities and develop a bilateral federated analytics framework that allows each side to contribute processed assessments to a shared operational picture without disclosing raw sensor data or the processing algorithms that generate it. This architecture preserves national intelligence equities while enabling genuine operational coordination. Australia's Ghost Shark XL-AUV and Speartooth (LUUV) programmes represent a significant potential contribution to this capability layer, while India's growing underwater drone industry could provide cost-effective medium AUV fleets at a scale that Australian procurement is unlikely to match. This initiative is the logical extension of the short-term recommendation that both governments set policy direction to allow technical collaboration in the development of these technologies, within the bounds of security constraints.

Long-Term Structural Development (Beyond Five Years)

The long-term trajectory of the bilateral undersea surveillance relationship points toward a distributed, multi-domain surveillance web that integrates seabed nodes, autonomous surface and underwater vehicles, maritime patrol aircraft, and, when required and mutually beneficial, submarines into a coherent, AI-enabled detection-and-cueing architecture. This is not a single program or acquisition, but is the cumulative product of the institutional, doctrinal, and industrial investments made across the near and medium terms, scaled up and deepened as trust and interoperability mature. While a full exchange of all undersea information will not be possible, the quantity and quality of such transfers should increase over each of the time horizons discussed, as confidence between countries builds, the common challenges expand, and technology allows the segregation and protection of that information that is not in each country's interests to share. The long-term horizon is where the full strategic value of the bilateral relationship becomes visible, but it can only be reached if the foundational work is done first.

Uncrewed Surface Vessels represent one of the most promising long-term investments for persistent barrier surveillance. Equipped with towed array sonar, variable depth sonar, acoustic modems, and satellite relay links, USVs can operate as persistent sonar pickets without the crew endurance constraints that limit the operational tempo of

surface combatants. While USV technology is already deployed, but it is generally in smaller surveillance vessels (such as Blue Bottles⁶⁴). There remains much work to be done on large, ocean-going USVs that can replace some of the roles that frigates have traditionally undertaken.⁶⁵ A joint India-Australia USV platform program, either developing complementary designs or co-producing common systems, could deploy persistent sonar pickets near the Timor Sea, the Sunda and Lombok approaches, and the eastern Indian Ocean, acting as a persistent tripwire. The vulnerability of USVs to interception or interference in contested waters means they must operate within a protective operational framework, but this is a problem that both nations will be better placed to solve jointly than separately.



ZeroUSV's Oceanus12 autonomous surface vessel showcased the deployment of two smaller C-Star USVs at the UK Defence Innovation trial in Plymouth in August 2026.

Source: ZeroUSV

The long-term surveillance architecture will also require hardened and redundant undersea cable infrastructure. Surveillance networks depend on undersea cables not only for data transmission but for the power supply of high-demand sensors, and the experience of recent years, including demonstrated interest in undersea cable infrastructure for strategic leverage, makes redundancy, concealment, and physical protection essential design requirements rather than optional enhancements. Australia's northern bases in the Darwin region and India's Andaman and Nicobar infrastructure represent natural hubs for a resilient bilateral cable architecture, and both governments should incorporate protection requirements into their infrastructure planning from the outset rather than attempting to retrofit them later. Counter-sabotage capabilities such as regular patrols, inspection regimes, and the ability to detect and attribute interference are a necessary complement to physical hardening.

Looking further ahead, both governments should invest in linking their bilateral architecture to the broader Quad framework. Without diluting national control over sensitive collection and processing capabilities, there are significant potential gains from inviting Japanese and American participation in sensor technology trials, acoustic signature libraries, and common standards for track fusion. The bilateral India-Australia relationship is well-positioned to serve as the backbone of a wider multilateral undersea surveillance network in the Indian Ocean, with the depth of interoperability built to date providing a stable foundation on which multilateral arrangements can be layered. This requires a conscious long-term strategic choice by both governments to invest in the bilateral relationship, not merely as an end in itself but as a building block of a larger regional security architecture.

Challenges and Constraints

Across all three planning horizons, several constraints will shape the pace and scope of progress. The most significant is the diplomatic challenge posed by the location of the most strategically valuable surveillance chokepoints. The Lombok, Sunda, Ombai-Wetar, and Makassar passages lie within Indonesian or East Timorese territorial waters and exclusive economic zones and deploying sensor infrastructure in or near them requires their acquiescence at a minimum and active cooperation at best. Indonesia has historically been reluctant to be perceived as facilitating the security agenda of US-aligned partners, and the optics of Australian and Indian sensor deployments in Indonesian waters, in the context of broader great power competition, will require careful management. A realistic diplomatic approach involves early and consistent engagement with these countries to ensure their equities are also met through a greater collective understanding of the undersea environment. The ‘treaty-level’ Defence Cooperation Agreement signed by Australia and Indonesia in August 2024 could provide an avenue to progress this initiative with Indonesia, as it eases the process of operating from each other’s territory.⁶⁶

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A second major constraint is the counter-surveillance and sabotage risk posed by China's growing undersea warfare capabilities, which include seabed interference, cable-cutting operations,⁶⁷ AUV countermeasures, and concepts for underwater special operations. Any surveillance infrastructure deployed in the Indian Ocean will be a potential target, and the architecture must be designed accordingly, with redundancy, physical hardening, concealment where possible, and routine patrol and inspection as a standing operational commitment. The acoustic complexity of the littoral

environment in archipelagic areas represents a further technical constraint: shallow water reverberation, complex thermal layers, and high ambient noise levels make advanced signal processing and multi-sensor fusion essential, and pure passive listening is unlikely to be adequate against modern quiet submarines in these environments.

Cost and sustainment constitute a third category of constraints, one that will differentiate what India and Australia can contribute across planning horizons. Seabed arrays, undersea cables and the required processing and dissemination capabilities are expensive to install and require sustained logistic investment to maintain. Autonomous systems may reduce manpower costs (although for some systems these savings will be minimal, as new people with different skills replace those who previously crewed the systems) but create their own sustainment demands, such as battery replacement, software lifecycle management, communications, and mission planning, that are easy to underestimate. India and Australia are likely to approach these trade-offs differently: India may focus on cost-effective, mass-deployable, simpler distributed sensors, while Australia prioritises fewer high-end autonomous platforms. A well-designed bilateral program should exploit this complementarity rather than attempting to force convergence on a single approach.

Finally, both governments must be consistently explicit throughout all phases of cooperation about the categories of information and capability that will not be shared. These will likely include the specific acoustic signature libraries of friendly submarines, the technical parameters of classified sensor systems, any SSBN-related intelligence, and raw sensor data that could reveal processing algorithms or collection methods. Clarity about these limits is not an obstacle to cooperation; rather, it is its precondition. Explicit red lines establish the boundaries within which both sides can invest with confidence, knowing that cooperation will not generate demands that exceed what either country can sustainably provide. A pattern of ambiguity on these questions erodes trust over time; a pattern of clarity and consistency builds it, with both sides knowing and accepting that there is information the other cannot share.

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Priorities for Decision-Makers

The framework set out in this section encompasses a wide range of initiatives across tactical, operational, strategic, and policy levels of decision-making. At the tactical level, the priorities are establishing enduring relationships between the Indian Navy and Australia's Joint Operations Command, agreeing real-time intelligence-sharing protocols for undersea warfare, and creating combined prosecution procedures and shared standard operating procedures that eliminate delay caused by procedural incompatibility. At the operational level, the focus should be on a common chokepoint surveillance plan that concentrates effort where submarines must transit, and a coordinated P-8A and P-8I patrol grid with deconflicted coverage zones. The effectiveness of this initiative would benefit from pre-positioned shared ASW stores at Port Blair, Darwin, Perth, and potentially Cocos Island. At the strategic level, the highest-priority actions are integrating space-based maritime ISR with ASW cueing, expanding reciprocal basing access for maritime patrol aircraft and autonomous systems, hardening the cybersecurity of undersea sensor networks, and initiating a bilateral AI governance framework for undersea warfare data processing.

Taken together, these measures form a coherent, achievable agenda. However, decision-makers who need to identify where to concentrate effort first should focus on five actions that are politically feasible, operationally practical, and capable of delivering measurable surveillance gains in the short term: institutionalising coordination mechanisms; agreeing real-time ISR-sharing protocols; coordinating chokepoint surveillance plans; coordinating P-8A and P-8I patrols; and collaborating (as far as possible) on the deployment of autonomous sensors in priority surveillance corridors. These five initiatives are mutually reinforcing; each generates institutional relationships, procedural habits, and shared situational awareness that accelerates the value of the others—and together they constitute the minimum viable framework from which the broader ambition of this chapter can be built.

Five actions that are politically feasible, operationally practical, and capable of delivering measurable surveillance gains in the short term

- 1 institutionalising coordination mechanisms
- 2 agreeing real-time ISR-sharing protocols
- 3 coordinating chokepoint surveillance plans
- 4 coordinating P-8A and P-8I patrols
- 5 collaborating (as far as possible) on the deployment of autonomous sensors in priority surveillance corridors

The future of undersea surveillance in the IOR is not a single large system. It is a distributed mesh of seabed nodes, crewed and autonomous surface vessels and undersea vehicles, maritime patrol aircraft, and eventually nuclear-powered attack submarines, integrated by AI-enabled processing and resilient communications, and sustained by the institutional relationships, professional trust, and policy frameworks that take years to build. Australia and India are two resident Indian Ocean powers that are well positioned to provide the backbone of that architecture. The task now is to begin building it.

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A framework across three planning horizons

What Australia and India can do in the next three years, in three to five, and beyond five

1 COORDINATION

Near-Term Initiatives

One to Three Years

- A standing bilateral coordination protocol linking the Indian Navy's operational command with Australia's Joint Operations Command
- A conscious review of information-sharing thresholds, with automated exchange where sharing is agreed to be mutually beneficial
- Indian participation in Exercise BLACK CARILLION, converting the October 2025 invitation into a confirmed commitment
- An executive-level agreement on patrol-zone responsibilities, cross-cueing protocols and communications procedures
- Combined standard operating procedures for P-8A and P-8I operations, exercised at AUSINDEX and MALABAR and reviewed annually
- A structured industry dialogue on co-development and co-production of autonomous undersea surveillance systems

2 INTEGRATION

Medium-Term Capability Development

Three to Five Years

- Coordinated undersea surveillance infrastructure at the key approaches, built around fixed multi-static active sonar nodes
- Distributed unattended seabed sensor networks, jointly developed as deployable kits that can be surged to priority locations
- A coordinated oceanographic and acoustic data collection program using P-8 patrols, surface ships and AUV gliders
- Autonomous underwater vehicles and ocean gliders for persistent monitoring of the chokepoints submarines must transit
- AI-enabled processing and a bilateral federated analytics framework that shares assessments, not raw sensor data

3 ARCHITECTURE

Long-Term Structural Development

Beyond Five Years

- A joint uncrewed surface vessel program deploying persistent sonar pickets as a tripwire across the eastern approaches
- Hardened and redundant undersea cable infrastructure, with patrol, inspection and the ability to attribute interference
- Bilateral architecture linked to the Quad through sensor trials, signature libraries and common track-fusion standards
- A distributed, multi-domain surveillance web integrating seabed nodes, autonomous vehicles, aircraft and submarines

- Described in the paper as the highest-value, lowest-cost initiative available to both governments in the near term

CONSTRAINTS THAT SHAPE ALL THREE HORIZONS

Diplomatic

The most valuable chokepoints lie in Indonesian and East Timorese waters and need their acquiescence at a minimum

Counter-surveillance

Chinese seabed interference, cable-cutting and AUV countermeasures make anything deployed a target

Cost and sustainment

Seabed arrays and cables are expensive to install and demand sustained logistic support

Explicit limits

Signature libraries, classified sensor parameters, SSBN intelligence and raw data stay out of scope

CONCLUSION

Australia and India are at a strategic inflection point in their undersea cooperation. The security environment that once justified cautious incrementalism—a PLA-N largely confined to near-seas operations, a relatively benign undersea environment in the IOR and a bilateral relationship still finding its footing—no longer exists. China’s submarine force is expanding in numbers and quality, its operational reach now extends routinely into the Indian Ocean, and Australia and India have both publicly identified the undersea domain as a priority concern. The question is no longer whether Australia and India should pursue deeper ASW cooperation, but how to do so in a way that is strategically durable, operationally effective, and politically sustainable.

This report has argued that the answer lies not in the pursuit of deep technical integration or alliance-style sensor sharing, but in the deliberate construction of the institutional, doctrinal, and operational foundations from which genuine strategic-level cooperation can grow. The combination of complementary geography, compatible platforms, and increasingly aligned threat perceptions provides a more favourable starting point than is commonly appreciated. What has been missing is the institutional commitment to convert those foundations into standing operational relationships.

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Undersea surveillance in the Indo-Pacific will increasingly depend on a blend of crewed platforms, fixed seabed infrastructure and mobile autonomous systems. Passive hydrophone arrays, multistatic active sonar barriers, and seabed sensor fields create persistent chokepoint tripwires. Mobile assets such as AUVs, gliders, USVs, aircraft, ships, and submarines provide localisation, tracking, and prosecution. For India and Australia, a combined approach is both feasible and strategically valuable. India’s geographic advantage in the Andaman Sea and access to the northern Indian Ocean, coupled with Australia’s advanced autonomous programs and deep alliance interoperability, creates a logical partnership. The most practical near-term strategy is to build a layered detection architecture around the chokepoints leading into the Indian Ocean, backed by rapid-response air ASW forces, while simultaneously investing in the institutional architecture that will allow that detection architecture to function more as a coordinated system rather than two parallel national efforts.

In an era where submarines remain among the most destabilising and least observable instruments of sea power, undersea surveillance infrastructure is becoming as strategically important as fleets themselves. The Indo-Pacific balance will increasingly be shaped not only by the number of submarines each side operates, but by who can find them first and maintain contact long enough to deter or defeat them. By resisting the temptation to pursue premature (and unrealistic) integration and instead focusing on doctrinal alignment, institutional trust, and a pragmatic expansion of information sharing, Australia and India can impose cumulative undersea pressure while preserving their respective autonomy and contributing to strategic stability. The distributed mesh of seabed sensors, autonomous vehicles, maritime patrol aircraft, and eventually nuclear-powered attack submarines that this report envisions is not a single large system to be built at once, but rather the cumulative product of sustained investment in the bilateral relationship, beginning now.

The task is not beyond reach. Both navies already possess the platforms, the institutional frameworks, and the political will to begin. What is now required is the deliberate decision to move from periodic exercise coordination to permanent operational partnership. That decision, taken in both capitals and sustained over the coming decade, is the single most important step available to Australia and India in building the undersea deterrence architecture both countries need to protect their Indian Ocean interests.

History suggests that the most effective security partnerships are not those formed in crisis but those built patiently in peacetime, accumulating the trust, familiarity, and procedural depth that allow them to function under pressure when the stakes are highest. Australia and India have the strategic alignment, the geographic complementarity, and the operational capabilities to build precisely such a partnership in the undersea domain. The imperative now is to act on that potential with the deliberateness and sustained commitment the strategic moment demands.

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