



NAVY LEAGUE OF AUSTRALIA
WESTERN AUSTRALIA

August 2023
Volume 7, Issue 8

DOWN THE VOICEPIPE

do you hear there!

COMING UP

NLWA Executive meeting

Monday 2nd October 2023

HMAS PERTH M Memorial Foundation
Executive meeting Saturday October
2023

Facility open each Wednesday morning
0900-1200

ALL ARTICLES PUBLISHED IN THIS
NEWSLETTER ARE PRINTED IN GOOD
FAITH AND DON'T NECESSARY REFLECT
THE VIEWS OF THE
NAVY LEAGUE OF AUSTRALIA

HMAS PERTH (III)

250



Navy League of Australia Western Australia Division News update



August was an action-packed month which saw the WA Division host a Dine In night for some high-ranking RAN officers, freshly posted into their new positions. Our thanks and best wishes go to CDRE Tom Phillips who has taken up the reins to oversee submarine operations out of HMAS STIRLING, CAPT Ken Burleigh who has become the CO HMAS STIRLING and CMDR Jorge McKee who has taken over as CO HMAS PERTH.

Just a few days later we held our AGM, which was well attended and included an overview of the Offshore Patrol Vessel Program by CMDR Cam Hooper, Commanding Officer of NUSHIP ARAFURA, soon to commission into the fleet as HMAS ARAFURA. The presentation was quite in-depth and interesting and was followed by Cam giving up a considerable amount of his time to speak with the members and field any questions they had. We thank Cam and wish him every success in Command of ARAFURA.

Fast forward four days and a few of us headed to HMAS STIRLING to see HMAS PERTH and former CO CMDR Tony Nagle presented with a host of awards, including the Duke of Gloucester Cup. We have always maintained a great relationship with HMAS PERTH so it was good to be present and see the ship recognised formally. It was likewise great to see the five-sided gold star in prominent position showing this feat to all.

One day post Gloucester Cup we had the privilege of having lunch with former CO HMAS PERTH, CMDR Tony Nagle at the Swan Yacht Club. Tony has moved to Brisbane and into a new position but has vowed to keep in contact, which we are grateful for and we look forward to hearing how he is going.

Towards the end of the month a few of us travelled to Dowerin, roughly 160km north east of Perth to check out the Dowerin Field Days, home of Australia's largest farming and agricultural show. Hundreds of exhibitors were selling everything from spare parts to hydraulic pumps to million dollar farm machinery. We had a thoroughly good time and would recommend to anyone interested that they should make the trek next August.

Our traveling group are about to hit the road again, this time venturing a few hours north of Perth to Perenjori in search of some wildflowers, the Wreath Flower in particular. You could almost say, with so many activities occurring throughout the month, there's more than a couple of people looking at the getaway as a time to rest and relax, though in saying that, if we were invited to participate in any or all of the above activities again, we'd gladly do so.

Until next month

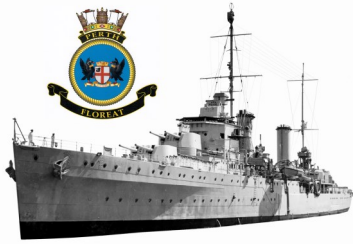
Brad





Combined NLWA and HMAS PERTH (I) Memorial Foundation INC. AGM





HMAS PERTH (I) MEMORIAL UPDATE Incorporating NLWA and the HMAS PERTH (I) Memorial Foundation Incorporated

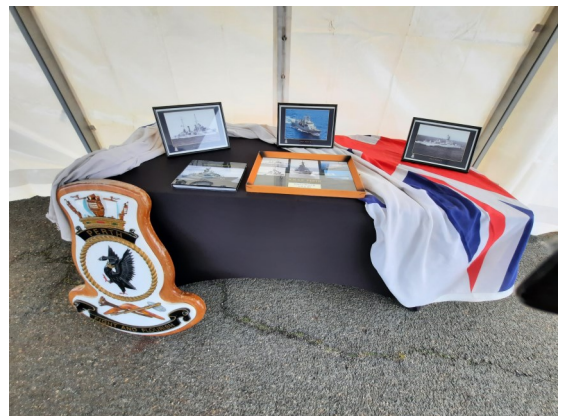


Jim O'Neill
CMDR ANC RTD
Project Manager

A milestone was reached this past couple of weeks with SRG International laying the foundations and concrete pad for the final stage of the memorial. We are achieving slow process with the final engineering design works for the steel and glass however the next few weeks should see this portion move onto the construction stage. To move the approval process along we have had to have a closed entrance into the structure due to fire services pressure not being achieved from Water Corps mains. Now that we have held our AGM the new committee will be also planning the opening of the memorial early next year.. Funding through over runs, material costs and extra engineering has left us around \$30000 short of our budget and certain finishes to the structure have been put on hold for the foreseeable future.



HMAS PERTH (III) Presented with the Gloucester Cup





Dining in evening with members and Newly appointed RAN Officers



CDRE Tom Phillips RAN COMSUB, CAPT Ken Burleigh RAN CO HMAS STIRLING and CMDR Jorge McKee RAN CO of HMAS PERTH (III)





Indian sub makes Australian debut

01/09/2023 Posted by Mike Hughes Fleet Base West, HMAS

[Perth](#), [HMAS Rankin](#), [HMAS Stirling](#), [Indian Navy](#) INS VAGIR

The crew of Indian Navy submarine INS *Vagir* were warmly welcomed to Fleet Base West during the first deployment of an Indian submarine to Australia.

CAPTION: *From front, HMAS Rankin, INS Vagir and HMAS Perth conduct manoeuvre exercises at the Western Australian Exercise Area during the Indian Submarine INS Vagir's visit to Fleet Base West in Perth. Story by Lieutenant Max Logan. Photo by Leading Seaman Ernesto Sanchez.*

HMAS *Perth* escorted *Vagir* to berth after it arrived in the vicinity on August 20.

Commander Australian Submarine Force Commodore Tom Phillips said the visit would carry on the success of Exercise Malabar and AusIndex and strengthen the relationship between the Australian and Indian navies.

"We're incredibly excited to be hosting our first visit by an Indian submarine," he said. "For our respective submarine forces this is an historic moment that we will remember and I hope this is the first of many more. We'll work together to improve our procedures, understand each other's capabilities and talk about our tactics so we have a better mutual understanding as we go forward."

Submarine certification manager Lieutenant Nicholas Scott-Dobbie said he enjoyed meeting the crew of *Vagir* during sport and social engagements at HMAS *Stirling*.

"The Indian Navy personnel were very friendly. They were keen to be in Australia and show off the new submarine," he said.

"We also discussed some of the similarities in submarine operation and training pathways." Lieutenant Scott-Dobbie said there is significant mutual respect between submariners from different countries. Having obtained a hard-earned badge distinguishes and identifies the members of the submarine community and is source of pride for the 'silent service'," he said.

"There is a mutual understanding of the arduous conditions and ever-present danger associated with operating under the sea." *Vagir* joined an Australian submarine, *Perth* and maritime patrol aircraft from Australia and India for exercises off the West Australian coast.

Austal nets \$91.5mln deal to build three LCU 1700 vessels for US Navy

by Fatima Bahtić

Austal USA has been awarded a \$91 million fixed-price incentive and firm-fixed-price type contract for the construction of three Landing Craft Utility (LCU) 1700 class craft.



Austal USA

The contract also includes options for nine additional craft and associated support efforts. The steel hull LCU1700-class possesses heavy-lift capability with 170-ton payload capacity and will be deployed with the US Navy's amphibious assault ships.

The vessels will support a range of military operations including the delivery of tracked and/or wheeled vehicles, troops and cargo from ship to shore, shore to shore and back to ship. These connectors provide a heavy-lift capability and can carry about the same payload capacity as seven C-17 aircraft.

*"Austal USA is honored to be able to build this important connector for the U.S. Navy," commented **Dave Growden**, vice president of new construction projects. "We recognize the critical role this platform plays in supporting expeditionary operations for the Navy and Marine Corps and are looking forward to continuing to deliver ships and boats to our customers on time and on budget."*

The LCU 1700-class has a roll-on / roll-off monohull configuration, with hydraulically controlled bow and stern ramps that allow multiple vessels to connect and form a causeway for fast and secure unloading and loading.

The craft are designed to be transported within, and load/unload from the well decks of amphibious assault ships, carrying loads up to 3.5 metres high, above the vessel's vehicle deck.

HMS Prince of Wales, UK's biggest warship, departs on autumn deployment

by Fatima Bahtić

Britain's biggest warship HMS Prince of Wales has sailed for its autumn deployment, pushing the limits of aircraft carrier operations with drones, fifth-generation stealth fighters, tilt-rotors and helicopters.



HMS Prince of Wales departs Portsmouth for the Eastern Seaboard of the USA to revolutionise the way the Royal Navy operates Carrier Strike Groups. The ship will:

- operate advanced drone technologies, demonstrating the delivery of vital supplies without the need to use helicopters;
- land and launch F-35 Lightning stealth fighters in more ways, more quickly and in the harshest of sea conditions to increase the strike carrier's firepower;
- and increase the range and conditions in which the US Marine Corps' MV-22 Osprey tilt rotor aircraft can operate.

Once in the Channel the ship's company will conduct trials with UK-firm W Autonomous Systems to assess the feasibility of drones delivering supplies to Royal Navy vessels at sea – initially flying in up to 100kg of stores. Both the Royal Navy and its supporting flotilla from the Royal Fleet Auxiliary are experimenting with drone technology. *"We are all excited for the longest deployment of HMS Prince of Wales,"* said its Commanding Officer Captain **Richard Hewitt**.

"Being the first to operate with this level of drones will be a huge achievement and keep us on the front foot as we prepare for the next major Carrier Strike Group deployment in 2025."

The F-35 has undergone extensive trials and assessment both in the US and UK operating from the flight decks of both Queen Elizabeth-class carriers and has deployed operationally. HMS Prince of Wales will also be looking to launch and land the Lightning jets in the heaviest sea states, proving that they can operate the jets in the harshest environments.

Once the work with the F-35s is complete, focus will shift again to the next-generation of Short Take-Off and Landing drones currently under development.

The Mojave drone can carry a 1,500lb payload of missiles, rockets or bombs and has been specifically designed to land and take-off from short runways, or flight decks.

US Navy christens 1st in a class of new towing, salvage and rescue ships

August 30, 2023, by Fatima Bahtić

The US Navy has christen the first Navajo-class towing, salvage, and rescue ship, the future USNS Navajo (T-ATS 6).



US Navy

As informed, the ceremony was held in Houma, Louisiana on 26 August. The future USNS Navajo is the first ship in its class and will be operated by the Navy's Military Sealift Command.

The vessels will replace the existing Powhatan-class T-ATF fleet ocean tugs and Safeguard-class T-ARS rescue and salvage ships in service with the U.S. Military Sealift Command. The Navajo-class is a new series of towing, salvage and rescue ships (T-ATS) being constructed for the U.S. Navy.

The Navajo-class is a multi-mission common hull platform that will be deployed to support a range of missions such as towing, rescue, salvage, humanitarian assistance, oil spill response and wide-area search and surveillance operations using unmanned underwater vehicles (UUV) and unmanned aerial vehicles (UAV).



US Navy names new Navajo-class T-ATS Solomon Atkinson

USS Zumwalt to receive hypersonic missile upgrades at HII

By [Diana Stancy Correll](#)

Friday, Sep 1



The guided-missile destroyer Zumwalt arrived at HII in Pascagoula, Miss., Aug. 19 to undergo a modernization period. (HII) The [guided-missile destroyer Zumwalt](#), which arrived at its new home port in Pascagoula, Mississippi, this month, is being outfitted with a [hypersonic missile system](#) by American shipbuilder HII.

The Zumwalt, which had returned to San Diego [for an undisclosed maintenance system issue](#) after departing for Mississippi, arrived in Pascagoula Aug. 19. The ship is now going through modernization, including installation of the Navy's Conventional Prompt Strike hypersonic missile system.

"The upgrades will ensure Zumwalt remains [one of the most technologically advanced](#) and lethal ships in the U.S. Navy," Cmdr. Arlo Abrahamson, a spokesperson for the Naval Surface Force, told Navy Times in a statement earlier this month



[Navy's hypersonic launcher is headed to flight testing next year](#)

Lockheed Martin's \$1.2 billion hypersonic missile contract includes the development of a ship-based launcher and flight tests next year.

By [Megan Eckstein](#)

The service aims to field hypersonic weapons on the Zumwalt by 2025, and Lockheed Martin announced in February it was preparing a ship-based hypersonic missile launcher for flight tests in 2024. Lockheed is developing the launcher, the weapon control system and other pieces of the missile.

Meanwhile, the Army, which has worked with the Navy to develop the missile, is set to field the weapon system by the end of this year.

On Tuesday, the Navy awarded HII a \$154.8 million contract modification to update the Zumwalt, after previously awarding the shipbuilder a \$10.5 million planning period contract in January for the modernization of the Zumwalt and the guided-missile destroyer Michael Monsoor.

The Monsoor will receive the Conventional Prompt Strike hypersonic missile system "during a future modernization period," HII said in a news release.

"It is an honor to serve the sailors of Zumwalt and to welcome them to our community," Ingalls Shipbuilding DDG 1000 ship construction manager Bruce Knowles [said in a news release](#). "The Ingalls team is ready to support you in completing this important work."

The Zumwalt concluded three months of [operations in the Western Pacific](#) last fall, where it conducted a series of joint and bilateral operations as part of its first operational employment.

The Zumwalt's first full deployment is expected during late calendar year 2026 or early 2027, when it will operate under U.S. 7th Fleet and U.S. Indo-Pacific Command leadership.

THE PAKISTAN NAVY: A GROWING REGIONAL FORCE

By **Trevor Hollingsbee** - August 30, 2023.



The Pakistan Navy Yarmook-class patrol ship PNS Tabuk underway in the Gulf of Oman, November 10, 2021 (Photo: US Navy/Petty Officer 3rd Class Sang Kim)

Formed in 1947, the Pakistan Navy (PN) is tasked primarily with the protection of Pakistan's sea lines of communication, support of Islamabad's maritime policies, providing a submarine-based second strike capability, multinational task force operations, and carrying out humanitarian missions. It also carries out regular defence diplomacy visits, particularly to fellow Islamic nations.

The PN includes an air arm, a marine corps, and the Pakistan Maritime Safety Agency, a coast guard-type organisation that is currently being bolstered by the commissioning of Chinese-designed, Pakistan-built patrol ships. The PN fought naval wars with India in 1965 and 1971, and reputedly continues to engage in covert combat operations.

A modernising force



The Pakistan Navy Zulfiqar-class frigate PNS Aslat during a joint exercise with the US Navy in the Persian Gulf, November 3, 2014 (Photo: US Navy/Mass Communication Specialist 1st Class Patrick W. Mullen III)

The service previously relied upon secondhand warships acquired from western navies, but it now looks mainly to acquire vessels from China and Turkey as well as indigenous manufacturers.

Latest assets to join the growing PN order of battle are the four Tughril-class multi-role frigates, based on the People Liberation Army Navy's (PLA-N) Type 054 frigates built by Hudong-Zhonghua Shipbuilding and China State Shipbuilding Corporation. The armament of these 4,200-tonne, 27-knot, diesel-powered warships consists of Chinese-manufactured LY-80N anti-shipping cruise missiles (ASCM), CM-302 surface-to-air missiles (SAM), anti-submarine rockets, torpedoes, two close-in weapon systems, and a 76mm gun. A Z-9 anti-submarine helicopter can also be carried, while Chinese search and fire control radars are fitted.

Three of the Zulfiqar-class frigates were built by Hudong-Zhonghua and are based on the design of the Type 053H frigate. One was constructed at Karachi Shipyard and Engineering Works in Pakistan. Armament includes C-802 ASCMs and FM-90M SAMs. There is a flight deck and hangar for a Z-9 helicopter.

The sole surviving old second-hand frigate is PNS *Alamgir*, the former US Navy Oliver Hazard Perry-class frigate USS *McInerney*.

The PN frigate inventory is due to be boosted significantly from 2030 with the addition of a planned six Jinnah-class frigates to be built in Karachi to a Turkish design under a technology transfer agreement.

Corvettes, patrol ships, and fast attack craft

Already under construction in Turkey at the Istanbul Shipyard are two Babur-class corvettes with two further examples in build at the Karachi Shipyard.

Two 2,300-tonne Yarmook-class patrol ships, built by Dutch shipbuilder Damen at its Galati, Romania shipyard, were commissioned from 2020. They feature a 30mm cannon, a number of machine guns, and a helicopter flight deck. Indigenous Harbah ASCMs are due to be fitted.

On PN strength are more than 50 missile or gun-armed fast attack, interception, and assault craft, many indigenously-built, others acquired from a range of overseas suppliers. Local construction of such vessels continues. There are also four minehunters of French design, as well as a squadron of UK-built Griffon Hoverwork 2000 TD hovercraft for coastal and riverine patrol.

A focus on submarines



All three of the Pakistan Navy's Cosmos-class shallow-water midget submarines (Photo: Pakistan Navy)

The PN's submarine arm is an increasingly important actor on the Asia naval stage. There are five French-designed Agosta-class boats, two of which were built by Karachi Shipyard. The three most modern of these subs feature air-independent propulsion (AIP) systems and can be armed with Babur III nuclear-warhead capable, underwater-launched ballistic missiles.

There are also three Italian-designed, indigenously-built midget submarines used for covert surveillance and insertion of Special Forces.

A major upgrade of the PN's underwater capabilities is underway in the form of a project to acquire eight new-build Hangor-class diesel-electric attack submarines based on the PLA-N's Yuan-class. Four are to be built in China, while four will be built in Pakistan. They will feature AIP and armament will include Babur III missiles. At least four are reportedly already under construction.

The service has a credible replenishment-at-sea capability to facilitate long-range operations. This capability is provided by two large tankers – one acquired from China, and one built locally. There are plans to build another such vessel in Pakistan.

The PN's surface escort and submarine fleets are largely modern and well-balanced, but there are obvious capability gaps with respect to dedicated aviation platforms and amphibious warfare vessels.

Islamabad wishes to eventually acquire nuclear-powered submarines in order to catch up with its great rival, India, but funding and political issues have so far frustrated that aim. The PN is nevertheless set to become an increasingly capable, versatile, and influential regional force.

A RARE SIGHTING OF A MODERN NORTH KOREAN SURFACE WARSHIP

By **Trevor Hollingsbee** - August 28, 2023.



Photo: Korean Central News Agency

North Korea's Korean People's Army Navy (KPAN) boasts large inventories of missile-armed fast attack craft and diesel-electric attack submarines, but its major surface warships are few and rarely seen.

There was therefore considerable interest when, on August 21, 2023, Pyongyang's *Korean Central News Agency* (KCNA) released details of a test firing of an indigenous, 2,000-kilometre range nuclear warhead-capable Hwasal land attack cruise missile from an Amnok-class corvette of the KPAN Eastern Fleet, bearing pennant number 661. This test firing was witnessed by no less than Supreme Leader Kim Jong Un.

This demonstration of KPAN maritime firepower was very likely intended to demonstrate that North Korean ship-launched nuclear weapons could reach both South Korea and Japan in time of war.

The corvette, displacing an estimated 2,000 tonnes, mounts heavy armament for a warship of modest size. There are eight launchers for Hwasal missiles. Backing up this main armament are four multi-barrelled close-in weapon systems, multiple launchers for short-range air defence missiles, torpedo launchers, anti-submarine rockets, and a 100-millimetre gun.

Surveillance, target acquisition, and fire control radars are also fitted. Sensors and weaponry are derived from early Russian and Chinese designs, and some analysts believe that some have probably been transferred from decommissioned KPAN assets.

The warship has some stealth characteristics. Earlier reports that it was built on an unfinished hull of a Krivak-class frigate acquired from Russia remain unconfirmed.

According to some reports, another similar vessel is at an advanced stage of construction.

USS Howard sustained ‘soft grounding’ near Bali ahead of port visit

By [Diana Stancy Correll](#)

Tuesday, Aug 22



Guided-missile destroyer Howard transits the Philippine Sea during Pacific Vanguard 23, on July 4, 2023. (MC3 Santiago Navarro/Navy)

The Japan-based guided-missile destroyer Howard, whose commanding officer was fired Saturday, [suffered a “soft grounding”](#) this month as it pulled into Bali for a scheduled port visit, according to Navy officials.

“On the morning of Aug. 10, USS Howard (DDG 83) experienced an apparent soft grounding shortly before arriving in Bali, Indonesia, for a scheduled port visit,” Lt. Luka Bakic, a spokesperson for U.S. 7th Fleet, said in an email to Navy Times. “Upon indication of potential grounding, watch standers took immediate action to protect the crew and the ship.”

“The ship was able to return to normal operations under its own power and propulsion,” Bakic said.

“There were no injuries as a result of the mishap.” The incident is currently under investigation, according to Bakic.

The Navy [relieved the destroyer’s commanding officer, Cmdr. Kenji Igawa](#), from his duties Saturday “due to loss of confidence in his ability to command,” the service said in a statement. The Navy did not specifically say that the grounding and Igawa’s ouster are connected.

“Cmdr. Igawa will be administratively reassigned to the staff of Commander, U.S. 7th Fleet,” the Navy said in a statement Sunday. Capt. Edward Angelinas, the former commanding officer of the guided-missile cruiser Robert Smalls and guided-missile destroyer John McCain, is filling in as commanding officer until a permanent replacement is identified for the Howard.

Angelinas [assumed command of the McCain](#) in October 2017, after the ship’s commanding officer and executive officer were fired following the vessel’s fatal collision in August. The mishap killed 10 sailors.



[Navy investigating grounding of cargo ship in Bahrain](#)

No personnel were injured, and there was no operational impact.

By [Diana Stancy Correll](#)

Igawa, who graduated from the U.S. Naval Academy in 2004, previously served as the executive officer of the Howard. He became the commanding officer of the ship in December 2022.

In June, the Navy [released a news story about Igawa](#) and his journey as a Japanese-American naval officer. After graduating from the Naval Academy, Igawa served as a communications officer providing linguistic skills and cultural insight into Japanese culture aboard the guided-missile destroyer Stethem, based in Yokosuka, Japan, according to the story.

“It’s an honor, and privilege to be working alongside and for my captain, Cmdr. Kenji Igawa,” Howard’s Command Master Chief Jarriel C. Gardner said in the Navy news release.

“You won’t find a more selfless and hard-working leader – an American of Americans, and it’s amazing to see a commanding officer in charge of a U.S. warship stationed in Japan with ethnic roots that tie him back to Japan,” Gardner said. Retired surface warfare officer Bradley Martin, now a senior policy analyst with the Rand Corp. and director of their National Security Supply Chain Institute, said in an email to Navy Times that the definition of “soft grounding” is a bit subjective.

Typically though, a soft grounding means the ship could maneuver free with its own power and encountered only slight damage, he said. In contrast, a hard grounding means the ship needed assistance to maneuver free and suffered significant damage. The Howard is based in Yokosuka, Japan, and is assigned to Commander, Task Force 71/Destroyer Squadron 15. In July, the Lewis and Clark-class dry cargo ship Alan Shepard ran aground in Bahrain at the ASRY shipyard in Al Hidd. The ship didn’t suffer any significant damage, and no personnel sustained injuries. The incident remains under investigation.

Why submarines are black: The answer isn't as straightforward as you might think

Laura Skitt



HMS Victorious in the Clyde area of Scotland as she returned from DASO 95 in October 1995 (Picture: Crown Copyright).

The answer to why submarines are black might seem straightforward, but it's not quite as obvious as it seems and is closely tied to why car tyres are the same colour. Let's delve into a bit of the history of submarines before expanding on that. It was during the First World War that submarine hulls started to be painted grey and the decks black to provide camouflage.

However, once the enemy's aircraft started flying over water, submarines could be spotted when they weren't fully submerged. Before nuclear power, diesel-powered submarines contained leading-edge technology but, compared to today's modern subs, were slow underwater vessels and spent a lot of their time on the surface to refuel and resupply. Fast forward to 1955, when the US Navy created the first nuclear-powered submarine, USS Nautilus, an underwater vessel that changed the course of maritime history.



HMS Vengeance returning to HMNB Clyde after completing Operational Sea Training in 2007 (Picture: Crown Copyright).

Due to the now vastly increased time a submarine could spend submerged underwater, and wanting to make the vessels as difficult to find as possible, led to a rethink when it came to the colour scheme.

Warships are grey to reduce the chance of the vessels being spotted by the enemy. For example, when a vessel is close to the horizon, a haze grey exterior can make it hard to identify accurately, even more so in foggy or cloudy weather conditions. Keeping that in mind, why are submarines black when they are also found at sea?

You might have seen posts on social media about which swimming costume colour parents should choose to help keep their children safe in the water in case they should find themselves unable to swim and go underwater. Neon yellows and greens are more visible the further the costume sinks underwater whereas the blue, white and black swimwear becomes barely visible very quickly. The same applies to submarines.



A submariner affixes HMS Triumph's nameplate in 2011 (Picture: Crown Copyright). Of all the colours of paint, black is the most durable and reflects the least amount of light, helping to camouflage the vast vessel when it is near the surface. And according to reports, there is barely any light once you reach 200 metres into the ocean. The test depth of a submarine is the maximum depth an underwater vessel can operate under normal peacetime circumstances.



How far does light travel in water? Submarine test depth information is often classified to prevent enemy forces having a tactical advantage. Official statistics released by the Royal Navy about its stealthy and powerful submarine fleet include the vessels' lengths, top speeds and weight – not the test depth. However, a testimony of a submariner on the Royal Navy's official website reveals a depth where there is rarely any light.

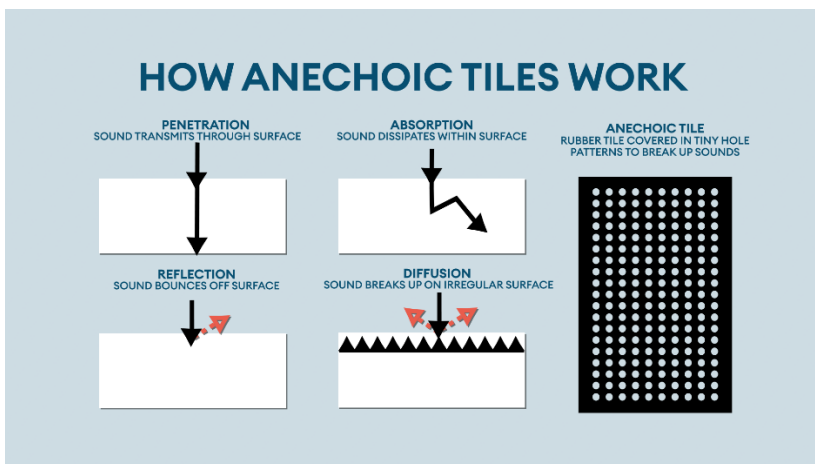


HMS Tireless, the third of the seven Trafalgar-class submarines, photographed in 2012 (Picture: Crown Copyright). Chef (Submariner) CH Hayes, said: "You can't beat the buzz of working in a kitchen – especially when you're 200 metres underwater." But submarines aren't black for that reason alone. Sometimes the perfect material for the job just happens to be black. It's all about anechoic tiles. According to the Royal Navy, Astute is covered by "more than 39,000 anechoic tiles that absorb active sonar and reduce noise radiated from within the boat." Photos of Royal Navy submarines resurfacing show off these impressive tiles for the world to see.



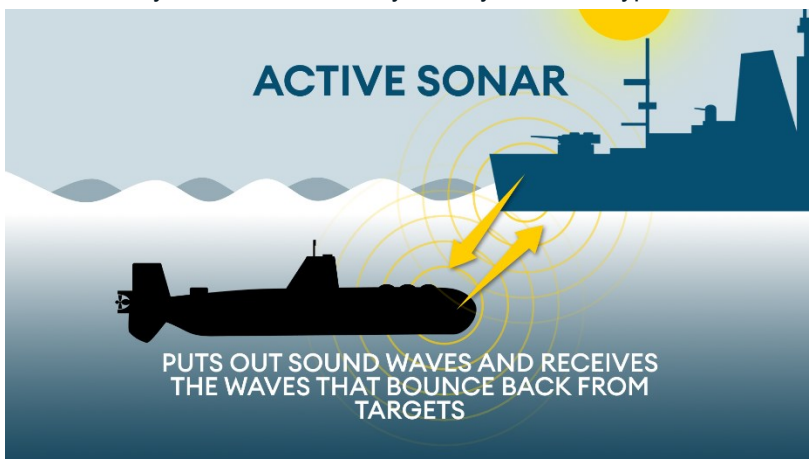
Anechoic tiles seen damaged and missing on HMS Vanguard during its second refit at Devonport in 2015 (Picture: Crown Copyright).

Reports say anechoic tiles make detecting submarines more difficult because their unique design distorts sonar waves being used to discover the vessel's location. In layman's terms, anechoic tiles to submarines are like the invisibility cloak to Harry Potter. The durable, porous material absorbs active sonar waves helping to make them less visible underwater.



How do anechoic tiles work? But what are active sonar waves?

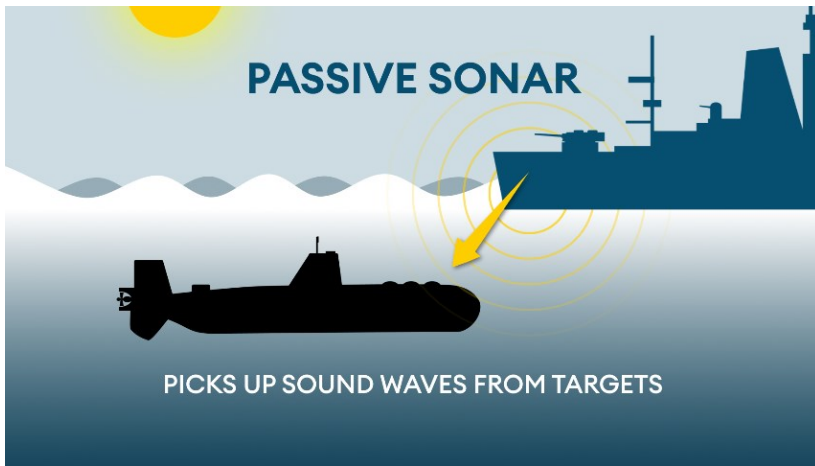
Just like whales and dolphins, submarines rely on sonar (sound navigation and ranging) to navigate in water. To find an enemy submarine, the Royal Navy uses two types of sonar – active and passive.



How does Active Sonar work?

Active sonar is a pulse of sound – a 'ping', let's say – that travels through water to an unknown object, only to return, be analysed and interpreted to give sonar operators an idea of what is around them. However, when a sound wave hits an anechoic tile, it is partially absorbed so, when it reflects back, it is reduced and distorted – confusing the enemy as to the submarine's whereabouts.

There is, however, a downside to using active sonar. There is a risk the 'ping' sound could be detected by enemy submarines so, more often than not, passive sonar is used to protect the vessel's location. Passive sonar is where operators listen for sound in order to detect a ship or other submarine and determine the trajectory. And thanks to black anechoic tiles reducing the sound coming from within submarines, doing that isn't as straightforward as you might think.



How does Passive Sonar work? So why are submarines black? Because their invisibility cloak, anechoic tiles, just happen to be black. And why are they black?

Rubber anechoic tiles contain carbon black, an odourless, insoluble, ultralight, fine black powder, to make them more durable underwater. The same goes for car tyres. Remember the connection between submarines and car tyres? Rubber is naturally white, not a colour usually associated with car tyres which are made up of a variety of different types of the highly versatile and malleable material.

To increase the durability of tyres, a substance known as carbon black is added to reduce wear and tear over time, increase tensile strength and protect the rubber from UV light damage. The same can be said for anechoic tiles. Also made of rubber, anechoic tiles used on submarines contain carbon black to increase their durability when submerging and resurfacing over and over again.

So that is why submarines are black.

USS CANBERRA



Inside 'nuke school', the elite US training ground preparing Australian submariners for an AUKUS future

By North America bureau chief [Jade Macmillan](#) and [Bradley McLennan](#) in Charleston



Lieutenant Commander James Heydon is one of three Australian graduates from the Nuclear Power School in Charleston, South Carolina. *(ABC News: Bradley McLennan)*

In America's deep south, a group of students has just completed one of the most rigorous academic programs in the US military.

And for the first time, there were Australians among them.

Three members of the Royal Australian Navy have graduated from the Nuclear Power School in South Carolina, more commonly known as 'nuke school'.

The training pipeline was established with the US as part of the AUKUS agreement, under which Australia will obtain its own nuclear-powered submarines.

"It's a historic event for our Navy, an historic event for our submarine force and I think it's an historic event for our nation," said Australia's Chief of Navy, Vice Admiral Mark Hammond. "Two years ago, this wasn't on the radar. "And we've come a long way in such a short period of time but there's a lot more work to do."

Years out from Australia's acquisition of nuclear-powered subs, the graduation is an early step towards making AUKUS a reality. But there are still major hurdles ahead when it comes to the broader workforce challenges presented by the plan.

Inside 'nuke school'



An example of one of the classrooms at the US Navy's Nuclear Power School. *(ABC News: Jade Macmillan)*

The three Australians — Lieutenant Commander James Heydon, Lieutenant Commander Adam Klyne, and Lieutenant William Hall — started at the Nuclear Power School in November with the aim of eventually qualifying to operate the reactors onboard nuclear-powered submarines.

Lieutenant Commander Heydon described the course he's just graduated from as a "four-year engineering degree crammed into six months". "Maths, physics, thermodynamics, fluid dynamics, radiological controls, to how do we safely steward and manage the nuclear plant and the nuclear by-products, are I guess aspects of what we've been learning here," he said. "My experience [in the Australian Navy] was ship design and ship construction.

"While they were aspects here, it was very foreign. So it was ... a crash course into the deep end, sink or swim, and we all swam."



Students have been training for the past six months. They will now complete another step of practical learning on board retired nuclear subs. (ABC News: Jade Macmillan)

The Australians will now have to complete another set of practical learning, which will include spending time on retired nuclear-powered subs known as moored training ships. After that, they'll receive further training in Connecticut before being assigned to a Virginia-class sub.

"The plan at this stage is to join submarines based in Pearl Harbor, Hawaii, and they'll complete their training at sea," Vice Admiral Hammond said. "Ultimately, we need them to pay their skills forward. "So once they're qualified, sufficiently experienced, then we'll get them back into the ecosystem in a different role. The Nuclear Power School teaches its students everything they need to

know to operate a nuclear reactor, including mathematics, physics, thermodynamics, fluid dynamics, radiological controls. (ABC News: Jade Macmillan)

AUKUS presents major workforce challenges for Australia

[The AUKUS plan, announced in San Diego](#) earlier this year, will see Australia acquire a total of eight nuclear-powered submarines at a cost of up to \$368 billion. US submarines are increasing their visits to Australian ports from this year, and from 2027 HMAS Stirling naval base in Western Australia will host rotations of American and British subs under what's known as 'Submarine Rotational Force-West'.



The US Navy has increased its visits to Australian ports since the AUKUS negotiations began. *(Supplied: US Pacific Fleet)* Australia is expected to buy at least three Virginia-class submarines from the US from the early 2030s, before building its own nuclear-powered boats in Adelaide to be known as SSN-AUKUS. They will be based on a British design using US technology, with the first scheduled to be delivered in the early 2040s.

[What is AUKUS and when are we getting nuclear submarines?](#)

[The final details of Australia's first nuclear submarine fleet have been unveiled — along with the price tag.](#)



Retired submariner and senior fellow at Washington-based think tank the Hudson Institute, Bryan Clark, described it as a "crawl, walk, run" approach. "The biggest challenge is going to be transitioning from having some Australian-owned, US-built submarines ... to having an Australian-built or at least a purpose-built Australian nuclear submarine," he said. "It's going to require a massive amount of infrastructure, incredible workforce demand, both in terms of technical skills and numbers. "It just seems like that's going to be a pretty heavy lift on the part of Australia to do nuclear ship construction."

"It just seems like that's going to be a pretty heavy lift on the part of Australia to do nuclear ship construction."



Bryan Clark, a retired submariner and senior fellow at Washington-based think tank the Hudson Institute. *(ABC News: Bradley McLennan)*

The federal government says AUKUS will create 20,000 jobs over 30 years across the Australian Defence Force, the public service and industry, including roles such as tradespeople, engineers and project managers. The number of Australian submariners will also need to be increased, with nuclear-powered submarines carrying larger crews and requiring personnel trained to operate the reactor onboard. "The submariners that come out of Australia are very smart, very capable, fully able to take on that challenge of becoming nuclear plant operators," said Mr Clark, who is also a former executive officer of one of the moored training ships in Charleston.

"The difficulty might be in getting the numbers that you need to be able to man a nuclear submarine."

Virginia-class submarines carry around 132 people, nearly three times the size of the crew onboard the Collins-class boats Australia has now. And unlike the Collins, nuclear-powered subs do not need to surface regularly to recharge, meaning they can stay submerged for months at a time.



Australia will continue to operate its Collins-class submarines for the foreseeable future. *(Supplied: Royal Australian Navy)*

Vice Admiral Hammond acknowledged the scale of the task confronting the Navy.

"We were already focused on recruiting, increasing the size of the submarine force and then initially bleeding across in smaller numbers into the nuclear power program and then scaling up as we go," he said. "So it's a complex challenge, especially given the workforce environment back in Australia."

"Every company, every organisation wants talent. So we'll be focused very, very clearly on recruiting and retaining."

Could Australia set up its own nuke school? More Australians are expected to follow in the footsteps of the first three graduates in Charleston, while Navy personnel are also training in the UK. But Vice Admiral Hammond said Australia could eventually host its own training program. "I think if we're serious about developing a sovereign nuclear submarine capability, then in time, definitely, all parts of the ecosystem built and operated by Australians in Australia, that should be the aim point," he said. "But we don't need it all at once." Asked where it could be located, he said the "sensible approach" would be either Adelaide or Perth. The new subs will be built in South Australia, while Western Australia's HMAS Stirling is undergoing an \$8 billion expansion.



HMAS Stirling is Australia's largest naval base. *(Supplied: Royal Australian Navy)*

"They will be the two centres of excellence, if you like, for naval nuclear propulsion in Australia," Vice Admiral Hammond said. "If you cast our minds forward, probably another 10, 15, 20 years, then the majority of the nuclear-trained submariners will be in the home port of the submarine force.

"There'll be a large number in Adelaide, but most of the boats won't be in Adelaide. So through that lens, probably WA. "But that's a decision for governments and probably a decision for next decade, I'd imagine."

Challenges lie ahead to bring AUKUS to fruition



The AUKUS deal will see the three nations work together on a new class of submarine to be delivered in the 2050s. *(AAP: Richard Wainwright)*

Aside from skills and workforce issues, there are other major challenges that still need to be overcome to bring AUKUS to fruition. The sale of Virginia-class submarines to Australia requires the approval of the US Congress, and significant changes are needed to a complex set of export controls restricting how sensitive technology is transferred.

Questions also remain over how the US will deliver the promised Virginia-class submarines, given the pressure its own shipyards are under to meet local demand.

The US Chief of Naval Operations, Admiral Michael Gilday, last month said it was ["too early" to provide an answer on exactly where the subs would come from.](#)

"I wouldn't expect them to start identifying submarines by name or by hull number just yet; we've got time to work through that," Vice Admiral Hammond said. "But at the moment, there is a deep tripartite commitment to doing this."



Lieutenant Commander Heydon, Lieutenant Commander Klyne and Lieutenant Hall will now move onto practical training. (ABC News: Bradley McLennan)

HMCS MONTREAL

A recent visitor to The Port of Fremantle





Navy League WA Jumbo Golf Day

Date: 22 October 2023

Location: Melville Golf Centre, 18 Dimond Court, Leeming (just off of Karel Ave)

Cost: \$25 per person, includes pull buggy, clubs, balls, game and *bbq lunch

Donation to chosen charity \$5 per player, can be more, chuck in your loose change

Melville Golf Centre is a licenced venue, no BYO alcohol

Plenty of parking

Jumbo golf is for everyone, you don't need any golfing background or special skills. The course length is shorter and much easier than a traditional golf course. Ultimately, it's a bit of fun and a chance to spend time with mates.

*BBQ lunch to consist of sausages, burger patties, salads, bread/rolls and condiments



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