AUSTRALIAN SUBMARINES
PAST AND PRESENT

When the Australian Colonies federated into one Commonwealth of Australia on 1 January 1901, it became clear that the new federation would need its own naval forces. A few years later, a vigorous debate broke out about whether these naval forces should include submarines.

At the time, the submarine was a primitive and not highly effective vessel, opposed by British powers as it threatened the huge surface fleet power of the Royal Navy (RN). In the event, however, despite opposition from Australian Naval Senior Officer and Director of Commonwealth Naval Forces Captain William Creswell, the Commonwealth Government announced in 1907 that Australia would purchase three ‘C’ class submarines to be built in Great Britain.

The order was later changed to two of the very newly designed ‘E’ class submarines. These were 178-feet long, displaced 796 tons submerged and were driven by two of the early eight-cylinder diesel engines driving two screws. They each had two periscopes and were armed with torpedo tubes at the bow, stern and one on each beam. To distinguish the submarines from the RN ‘E’ boats, they were designated as ‘A’ in the class, hence being known as HMAS Submarines AE1 and AE2. The vehicles were constructed at the Vickers Sons and Maximus Ltd shipyard at Barrow-in-Furness, Lancashire in England. The Commonwealth Government also ordered a depot ship (later named HMAS Platypus [I]) to support them, but World War I (1914-1918) intervened and Platypus did not come to Australia until after the peace in 1918.

AE1 AND AE2

AE1 left Barrow on 20 January, and AE2 on 10 February, escorted by HMS Adamant. After commissioning, both submarines sailed from Portsmouth on 2 March 1914 escorted by HMS Eclipse. After a voyage by way of the Suez Canal, during which they overcame significant mechanical problems, the ships arrived in Sydney on 24 May 1914. Their surface ship escorts carried the spare crew, in addition to much equipment and personal baggage. This voyage was regarded as a major historic feat and received worldwide attention.

In Sydney, repairs and maintenance were taken in hand, with both submarines docking in the Cockatoo Island Dockyard. Most importantly for the crew, leave was taken. About half of the sailors were in the Royal Australian Navy (RAN), the other half being on loan from the RN, so for many of them it was a homecoming. Each boat had three officers. In AE1 they were Lieutenant Commander TP Beston, RN, as commanding officer, Lieutenant CL Moore, RN, as first lieutenant and Lieutenant the Hon L. Scarlett, RAN, as third hand. In AE2, Lieutenant HBDG Stoker, RN, was commanding officer, Lieutenant GA Haggard, RN, was first lieutenant and Lieutenant JC Pitt Carey, RN, was third hand. Two engineering officers were assigned to standby the building and subsequent operations of the submarines. They normally remained in the depot ship during operations, but sometimes came aboard for trials at sea. Engineer Lieutenant Commander DP Herbert, RAN, was the squadron engineering officer, assisted by Engineer Lieutenant HG Paterson, RAN.

When war broke out between Britain and Germany on 4 August 1914, a primary objective for the new Australian fleet was the capture of the German colony of New Guinea through an engagement with the German Pacific Fleet, led by the armoured cruisers Gneisenau and Scharnhorst under Vice Admiral von Spee. The Australian
The 'J' class submarines were a significant upgrade to their predecessor 'I' class boats.

fleet, under the command of Rear Admiral Patey, RN, did a sweep through the Rabaul area in mid-August. They returned in September, this time with AE1 and AE2, to support landing parties to capture the German colony—a mission that required some land fighting and incurred a number of casualties.

On 14 September 1914, AE1 was on patrol looking out for the German fleet in the Rabaul area near the Duke of York Islands, and with HMAS Parramatta (I) in the near vicinity. It was here that AE1 disappeared with all 35 hands. No trace has ever since been found, despite a number of Navy and privately funded expeditions to the area. It was a tragic loss for the newly established RAN and the families concerned. There was, however, a war to be fought and, after a search and a brief inquiry, the fleet went about its business and eventually returned to Sydney. A vigorous new search in the deep surrounding waters off the Duke of York Islands is planned for the future.

After the loss of AE1, it was resolved that AE2 should return to the war in European waters. The submarine hence became sole escort of the second convoy of the 1st Australian Expeditionary Force of 15,000 troops and their 3000 horses, travelling across the Indian Ocean to the Suez Canal, and arriving in the area in late January 1915. Instead of continuing on to British home waters, AE2 was directed to the Dardanelles campaign and joined the three RN 'B' class and two French submarines, then based on the depot ship Hindo Kosh.

The allied naval forces steadily increased under Vice Admiral Sir Sackville Carden, RN, as the fleet prepared to force the Dardanelles, proceed up the Sea of Marmara and attack Istanbul in order to force the Ottoman Empire to return to neutrality and, it was hoped, to change the face of the war. Firing on the forts by the capital ships began in mid-February 1915; some ships were lost to mines, Carden was replaced by his second in command, Vice Admiral Sir John de Robeck, RN, and eventually the army was called in for a military landing. Stoker pressed for permission for AE2 to attempt the penetration of the Dardanelles but, when returning from a patrol on the evening of 10 March 1915, AE2 ran aground. The naval staff had turned off the navigation light marking the entrance to the harbour at Mudros and had not passed this vital information to Stoker.

After a hazardous time aground dogged by the risk of becoming a total loss, AE2 was towed off.
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the rocks and transported to the dockyard in Malta for repairs. Whilst here, the submarine depot ship HMS Adamant and HMAS Submarines E11, E14 and E15 arrived on 6 April 1915 on their way to join the campaign. As a result of discussions amongst the commanding officers drawing from their experiences against mines in the North Sea, some wires were welded around the outside of AE2’s hull and planes to prevent mine mooring wires catching. This action subsequently saved their lives.

On return to the forward area, Stoker was given permission on 22 April to attempt the penetration, five days after E15 was lost in just such an attempt, and so, after some storing and checking equipment, AE2 sailed. In the early hours of 24 April, after a silent surface journey into the straits to conserve the battery, she dived as dawn was breaking but, when a forward hydroplane coupling broke, control of the dived submarine became impossible. They surfaced and raced back out of the danger area just as dawn broke. Early on the morning of 25 April 1915, whilst the embarkations into the landing craft and the landings along the Gallipoli peninsula were in progress, they tried again.

AE2 had been instructed to create a diversion – to ‘run amok’. She began the passage on the surface but, when detected, the accurate gunfire from the Turkish forts forced her to dive as she approached the minefields guarding the straits. After surviving an anxious time as mine moorings scraped along the sides, AE2 returned to periscope depth in the narrows, attacking and damaging a Turkish torpedo boat. The concern caused by the submarine’s presence forced a battleship monitor that was bombarding the ANZACs across the peninsula to ceasefire and weigh anchor. The swirling currents in the narrows caused AE2 to run aground twice in the most hazardous circumstances, but finally and against all the odds, she got safely through. With little power remaining in the battery, Stoker bottomed the submarine to wait out a frantic search now under way as surface vessels towed grappling lines in an attempt to hook up AE2. After 16 hours dived, she finally surfaced and, under cover of darkness and a rainstorm, re-started the diesel engines and were hence able to change the air and recharge the battery.

Upon surfacing, AE2 sent a wireless message of success. Its receipt in the headquarters on board HMS Queen Elizabeth may have influenced the decision by General Hamilton, the commander in chief, not to evacuate the ANZACs from their perilous position ashore. The ANZAC troops, most of whom knew AE2 from the convoy and the journey through the Suez, put a note on a stump that stated: ‘Australian sub AE2 just through the Dardanelles. Advance Australia.’

Knowing of this triumph, the E14 set out in the early hours of 27 April and was also successful in getting through. Following this event, submarine operations in the Marmora had a major beneficial effect for the Allies at war. Regardless, after five days of operations and having met up with E14, the AE2 was involved in a battle with the Turkish gunboat Sultan Hissar and its pressure hull was holed by gunfire. Unable to dive, Stoker and his crew abandoned ship and scuttled the submarine. The Turks rescued them and the crew spent more than three years as prisoners of war, four of them dying from the harsh conditions, malnourishment and disease. The sinking of AE2 marked the loss of both Australian submarines whilst seeking out the enemy, making them the only RAN ships lost in World War I. Ironically, AE2 was both the first RAN ship to torpedo an enemy warship and the first RAN ship to be lost in battle. The wreck of the submarine has since been found in the Sea of Marmora, and is now being safeguarded by a combined team of Australian and Turkish personnel. They will commemorate this memorable battle during the ANZAC centenary in 2015.

It is noteworthy that AE2 led the way in the first successful submarine sea denial campaign.

*J* class submariners.
in history. The 15 patrols by Allied submarines sank more than 360 Turkish ships, the easy 12-hour passage from Istanbul by sea was denied and the Turkish army was compelled to use a licentious overland route by rough tracks and only limited railway access to resupply the defending army on the Gallipoli peninsula. The Turkish army was never able to build sufficient strength to drive the Allies back into the sea and the Allied submarine campaign, pioneered by the AE2, played a major part in this.

‘J’ CLASS SUBMARINES AND HMAS PLATYPUS

With the loss of AE1 and AE2, the Australian Government made inquiries to the Admiralty about the prospect of building submarine replacements. As peace approached in 1918, the Australian and British governments seriously addressed the matter. It was resolved that the British government would make a gift to Australia of the six ‘J’ class submarines then in service.

The ‘J’ class boats were a major advance on the ‘E’ class. They had been designed with the much higher surface speed of 20 knots so they could work with the main battle fleets. Called the ‘Reapers,’ it was thought they would dive and torpedo the enemy ships with great effect. To achieve this higher speed, they needed three diesel engines and a larger displacement than the ‘E’ class. As such, they displaced 1204 tons surfaced, 1820 dived, were 274-foot, 9-inch long with a 23-foot, 6-inch beam, and were armed with a deck gun and four torpedo tubes in the bow (two beam tubes were originally constructed but were later removed). The maximum safe diving depth was 300 feet. The sixth and last of the ‘J’ class was completed in August 1916, and the squadron war service was located mainly in the North Sea, based on Blyth on the English east coast.

One of the squadron, HMAS Submarine J7, was accidentally sunk by a British ‘Q’ ship on 15 October 1918 when the ‘Q’ ship failed to recognize its White Ensign and opened fire at close range. All but 16 of the crew members lost their lives. The Admiralty decided to keep the number of the class at six, so a building ‘K’ class hull was appropriated and, after some construction changes, the J7 came back into service in August 1918. There were also six gift destroyers, so the crewing of these new additions to the RAN proved a real challenge. For this reason, the destroyers were ultimately mothballed in the UK and never did join the RAN. With great assistance from the RN at every level, the manning of the ‘J’ submarines was achieved after a great number of men volunteered.

The six ‘J’ boats had RN officers but nine Australian sub lieutenants were posted to them for submarine training. They were FE Gething, JB Newman, FL Larkins, NK Calder, HA Showers, CAR Sadlier, LL Watkins, AD Conder and J Cunningham, all of whom were drawn from the first entry into the RAN College in 1913, then based near Geelong, Victoria.

With the peace, the submarine tender Platypus was transferred to the RAN and prepared to accompany and support the ‘J’ class squadron during their voyage to Australia. The captain of the depot ship was Commander EC Boyle VC, RN, who had been the captain of EI4 when it was about to rendezvous with AE2 before she was lost. His Victoria Cross was awarded for exploits on EI4 in the Sea of Marmora. The first lieutenant of HMAS Platypus (I) was Lieutenant G D’Oyley Hughes DSC, RN, whose exploits as first lieutenant of the EI1 in the Sea of Marmora had been the reason for his receiving the Distinguished Service Cross. The other officers and ratings in the submarines, in spare crew and in the squadron depot ship were men of similar distinction and experience, and they combined well with the RAN personnel.

Sailing for Australia was delayed again and again due to many defects in the submarines resulting from a long hard war service. Finally, on 9 April 1919, escorted by HMAS Sydney (I) and Platypus, HMA Submarines J1-J5 and J7 sailed from Portsmouth. They called at Gibraltar, Malta and Suez, meeting up with HMAS Australia (I) on the way, then stopping at Colombo, Singapore and Thursday Island. Platypus and five of the submarines finally arrived in Sydney on 15 July 1919. Sydney and J2 arrived on 19 July, having detoured for a visit to Brisbane. The submarines berthed at Garden Island, where they were refitted during extensive maintenance periods. Sadly, over the night of 19-20 June, while in Indonesian waters, Sub Lieutenant Larkins was washed overboard from J2 whilst sleeping on the casing (as was then usual for the off-watch personnel) and, despite a search, he was never found.

The Australian Naval Board had not made adequate preparation for the arrival of a submarine flotilla. They finally resolved to base it at Osborne House, Curio Bay, near Geelong, which remained a defence establishment after the RAN College had moved to Jervis Bay. Platypus and some of the boats sailed there in 1920 and established a base, with the other submarines joining as their refits permitted. The torpedo-boat destroyer HMAS Swordsmen was also attached, and the flotilla operated from there until 1922. Budget reductions in the RAN then meant that ships had to be decommissioned and, after a great deal of careful consideration and consultation, the Naval Board resolved on 22 November 1922 that the ‘J’ class submarines were obsolete and too worn out to be of further service. In February 1922, J3 was
sank off Swan Island in Port Phillip. The other submarines followed a similar fate in and outside Port Phillip Bay, with J7 being the last as it was used to supply power to Flinders Naval Depot. The J7 battery casings were used to build squash court walls, and some of its copper piping, suitably silvered, became candleabra in the Wardroom.

‘O’ BOATS 1928-1931

The Australian Government decided to continue with a submarine service and, after much debate and many consultations with the Admiralty, in 1925 it ordered two submarines of the new British ‘O’ class to be built by Vickers at Barrow-in-Furness. These vessels were larger than the preceding ‘J’ class and had, by those standards, a long range of 5000 miles at 9.5 knots on the surface, and could manage 4 knots dived. They had eight torpedo tubes and one 4-inch gun.

AO1 was delivered on 22 July 1927 and named HMAS Oxley (I), while AO2 became HMAS Oway (I). The two boats were accepted into the Navy on 9 September 1927 and sailed for Australia from the submarine base at Gosport on 8 February 1928. Both vessels consisted of mainly RAN officers and crews, although the RN supplied both commanding officers. Many of them had served in the ‘J’ boats and several in AE2, of which Chief Petty Officer Bray was a leading light. Despite this, while in Malta, the deficiencies in the design of the new main engines came to light, and both submarines were unable to continue. From February to November 1928, the main engines were stripped down and rebuilt by the Vickers team, assisted by the submarine engineer crew. Oxley and Oway then sailed and, after stopping at Malta, Suez, Aden, Colombo, Singapore, Batavia and Dutch Timor, they went on to Thursday Island, where they were met with support when Platinum joined them. On 14 February 1929, they arrived alongside Garden Island, Sydney, where the crews took leave and the submarines went into a maintenance period.

From a base at Corio Bay, Geelong, Oxley and Oway were engaged in operational and training manoeuvres during the early part of 1930. However, in view of the dwindling financial resources during the increasing world financial depression, and the unlikelihood of the fleet being built up to the six-planned boats, the Naval Board decided not to continue with them. They were placed in reserve and the crew numbers were gradually reduced. Finally, on 19 January 1931, the Minister for Defence, the Hon A E Green, announced that Oxley and Oway would be handed over to the British government who would thereafter maintain them. This transfer proceeded smoothly, with the submarines being paid off in Sydney on 9 April 1931, commissioned into the RN the next day and sailed with their new RN crews on 29 April. When World War II broke out, both boats were used in active service and, in a tragic incident on 14 September 1939, HMS Oxley was torpedoed in the North Sea by one of her sister submarines, HMS Triton. She sank with all hands except the commanding officer and the lookout then on the bridge. The two submarines were on patrol in adjoining patrol areas and, in the difficult navigation conditions, one had accidentally strayed into the other’s area. For her part, Oway saw the war out and was sold for scrap in August 1945, with the hull ending up on a mud bank in Dar es Salaam, Africa.

K9 1943-1944

After the gift of the two ‘O’ boats to the RN in 1931, the RAN submarine capability and thinking was minimal. Guntery, aircraft and anti-submarine warfare prevailed. With the outbreak of World War II and after the Japanese Imperial forces invaded the Dutch East Indies colony, much of the Dutch armed force escaped to Australia. This fleet included, amongst others, submarines KVIII, KIX and XXI – the ‘K’ standing for ‘Koloniën.’ Built in 1922-1923, they were of a somewhat
larger class than those used by the Dutch navy in European venues, being 512 tons surfaced, 712 tons submerged, 210 feet long and powered by two MAN diesel engines giving a surface speed of 15 knots and a maximum submerged speed of 9.5 knots.

*KVIII* and *XXII* were deemed beyond war use, but the third boat, renamed HMAS Submarine *K9* and commissioned into the RAN, was used in anti-submarine training for the frigates. *K9* was based in Sydney and had a major overhaul, including installation of a replacement battery, with a composite crew from RN, Dutch and RAN personnel. The boat did some useful work between Sydney and Jervis Bay, but it was always subject to defects. Finally, on 22 January 1944, a defective starboard main motor gave rise to a spark into the poorly ventilated battery, which resulted in a major battery explosion. The submarine was decommissioned on 31 March 1944; the crew dispersed to other war roles, and the *K9* was stripped of much of its material. Whilst being towed out of Sydney it broke away from its tow in heavy weather and ended on the beach near Seal Rocks on the mid-northern NSW coast. On 20 July 1945, the Commonwealth sold the wreck for scrap.

### 1944-1947

After decommissioning of the *K9*, there were no RAN submarines until the *Oberon* class were commissioned in 1967. During World War II, the Royal Navy and the United States Navy (USN) both had substantial submarine activity in Australia. At first the US effort was based in Brisbane. Later there was a major buildup based in Fremantle, including British and Dutch submarines. When the war ended, Fremantle was the second largest US submarine base, and more than 170 Allied submarines had made 416 war patrols from there. Apart from their operations against the Japanese forces, from time to time US submarines were made available to RAN ships for anti-submarine training.

 Australians served aboard the British X Craft, XE Craft, Welman and Welfreighter miniature submarines during World War II. In particular, Lieutenant KR Hudspeth DSC, RANVR commanded HM Submarine *K29*, who carried members of the Combined Operations Pilotage Party, who surveyed what would become Omaha Beach at Normandy prior to the landings. The RN sent the 14th Submarine Flotilla of six XE craft submarines accompanied by their depot ship HMAS *Kangaroo* to Australia in 1945, and they did sterling service. In particular, the H M Submarine *XEL*, with two Australians in the three-man crew, Lieutenant Max Shean, RANVR as the commanding officer and Sub Lieutenant Ken Briggs as the diver, managed to sever the main Japanese undersea communication cable in the sea outside Bangkok, which was a major triumph. The Japanese forces then had to use radio in the main, and the Americans were able to intercept and to break the codes of their voluminous signal traffic.

 Welman single-man miniature submarines were used by the members of Special Operations Australia (Z Special Unit of the Services Reconnaissance Department) during their second and ill-fated operation against Singapore in October 1944. Other elements of Special Operations Australia operated the Welfreighter six-man miniature submarines out of the secret bases at Garden Island, Western Australia, and at East Arm, Darwin.

Then in 1949, under an agreement between the British, Australian and New Zealand

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**HMAS Onslow and crew.**
governments, the British RN 4th Submarine Squadron was established in Sydney, based at HMAS Penguin, Balmain, and later at HMAS Platypus, Neutral Bay. Over the years, the ‘T’ and the ‘A’ class boats that served in the 4th Squadron did sterling service. Their main task was to train the anti-submarine personnel in the RAN and the RNZN ships, but they also provided a valuable input into developing RAN tactics and brought a wonderful spark to the Sydney naval scene. When the USN submarines visited Australia from time to time they too often gave some anti-submarine training to the RAN. The last of the British 4th Squadron, HMS Trump, left Sydney in 1969, by which time the first of the new Australian Oberon class submarines, HMAS Oyster (II), had arrived in 1967 and the second, HMAS Otway (II), in 1968.

OBERON CLASS 1967-1999

The senior officers of the RAN had not pressed for the re-establishment of an Australian submarine service until the British government gave notice of its intention to withdraw the 4th Submarine Squadron. They then asked for sufficient submarines for training purposes, but the then Minister for the Navy, Senator John Gorton, pressed for an offensive capability as well. On 22 January 1963, he announced Cabinet approval for eight Oberon class submarines. Despite this, the contract for the construction of only six was given to Scott's Shipbuilding and Engineering Co Ltd of Greenock, Scotland.

Planning for these Oberons had been done in Navy Office, Canberra beforehand and arrangements were made with the RN for initial and consolidation training to be conducted in RN submarines. In April 1963, the first draft of sailors left for submarine training, followed in June by the first two officers. The generosity of the RN submarine service and the excellent relationships between RAN and RN personnel made the whole program run smoothly. The same could be said for the Canadians, whose government had also contracted to buy Oberons for the Royal Canadian Navy.

The Oberon class submarines were 295-feet long, with a beam of 26.5 feet, a surface displacement of 2186 tons, a submerged displacement of 2417 tons, and were propelled by two 16-cylinder diesel engines driving two motors, which drove two separate shafts. They were armed with six bow tubes firing various torpedo types and eventually Harpoon missiles. The maximum speeds were 19 knots dived and 15 knots surfaced. As with all classes, there were changes over the years as the construction and the refit of the submarines in the class proceeded.

HMAS Oyster (II) was launched in September 1965, commissioned on 18 April 1967 and arrived at Platypus, Neutral Bay, Sydney on 18 August 1967. Lieutenant Commander DH Lorrimer was the commanding officer and the first lieutenant was Lieutenant IDG MacDougal, later an admiral and the chief of navy. On 10 January 1969, the RN squadron was disbanded and the new RAN Submarine Squadron was formed, with Commander WJ Owen as the commanding officer. The other boats followed Oyster at regular intervals, with HMAS Otway (II) arriving in Sydney on 7 October 1968 (Lieutenant Commander Gordon Dalrymple; Lieutenant Michael White), HMAS Ovens on 17 October 1969 (Lieutenant Commander Barry Nobes; Lieutenant Tom Harrison), HMAS Oorangaw on 4 July 1970 (Lieutenant Commander Charles Nixon-Bickersall, RN; Lieutenant Tim Bowra), HMAS Orove on 3 July 1978 (Lieutenant...
HMMS Collins sails out through the channel to meet HMMS Walker and HMMS Rankin at Gage Roads.

Commander Rob Woolrych; Lieutenant Kim Pirt and HMMS Otama on 15 December of that same year (Lieutenant Commander Frank Wolfe; Lieutenant Tony Smith). In the late 1970s and early 1980s the Australian-designed Submarine Weapons Upgrade program was carried out, providing a significant upgrade to the combat systems and sonars of the submarines. This included a replacement of the British Mark 8 and Mark 23 electric torpedoes with the US Mark 48 torpedoes and, most importantly, the US Harpoon anti-ship missile that was fired out of the torpedo tubes and which then surfaced for its flight.

For over 30 years, the Australian Oberons provided reliable service and, at times, they were very successful in many fields of submarine operations, including intelligence gathering and working with allied navies, especially with the USN. In 1987, there began a shift in RAN submarine organisation, when one submarine was based in Garden Island, near Fremantle, Western Australia. The squadron then operated from both the east and west coasts of Australia. In the 1990s, it was relocated from its base at Plantypus in Sydney to the newly constructed submarine base at HMMS Stirling in Garden Island, near Fremantle, where the base and the submarine headquarters still remain.

No major collisions or groundings occurred but in the course of operations, three lives were sadly lost. Able Seaman CJ Passlow died as a result of asphyxiation after Osnalow's diesels accidentally released exhaust gases inside the boat and Able Seaman H Markcrow and Seaman D Humphreys were drowned in 1987 when Otama dived off Sydney while they were still working in the fin outside the pressure hull.

Despite many reports and upgrades to the Oberon class, their time for service came to an end and they were decommissioned one by one: Osnalow on 13 February 1992, Osnay on 17 February 1994, Ovens on 1 December 1993, Orion on 4 October 1996, Osnalow on 29 March 1999 and Otama in December 2000. HMMS Plantypus, the submarine base at Neutral Bay in Sydney, was decommissioned on 14 May 1999 after a job well done.

**Collins Class 1996**

Naturally, because of the long lead time required, planning for the next class of submarines was in hand by the early 1980s. By early 1982, it had been decided to build the next class in Australia to an overseas design. After a long and complicated tender process, the Minister for Defence, the Hon KC Beazley, announced on 18 May 1987 that the contract would go to Kockums, Sweden, for six of the Swedish Type 471 vessels, modified to meet Australian requirements. He further announced that they were to be built at Port Adelaide, South Australia, by a new company called Australian Submarine Corporation. A project team was formed in 1982, with Project Director Captain GD White and Commander IA Noble, Commander RR Fayle, Commander AD Carter and Lieutenant FL Owen. It was set up with experienced submarine officers, and, while the project and team gradually changed over the subsequent years, it remained a dedicated and effective group of people. On 3 June 1987, a contract for construction of six submarines was signed with Australian submarine Corporation.

After years of pioneering work in combining the Swedish design and early construction of the hull with the hundreds of other contractors, the first of the Collins class, HMMS Collins, was commissioned on 27 July 1996. The Collins class displaces 3050 tonnes surfaced, 3350 tonnes submerged and is 255-foot long with a beam of 26-foot. The six tubes, all in the bow, fire Mark 48 wire-guided torpedoes and Sub Harpoon missiles. Propulsion comprises two propulsion motors on the one shaft, powered by 300 tons of battery, achieving a maximum speed of over 20 knots dived and 10 knots surfaced. The batteries are charged by three 18-cylinder diesels, driving 1.3 MW generators.

As with all new designs, there were significant first-of-class problems, but the skills of the engineers and others gradually reduced or eliminated them. The poor publicity attracted by these issues became an enduring issue. In the meantime, the other five boats followed Collins out from construction with the commissioning.

The many years of operations of the *Collins* class have seen incidents but no major accidents to date. On 12 February 2003, one came close when *Dechaineux* had a flexible hose in the lower motor room blow out while on a deep dive. Although there was a serious inflow of water, the emergency shutdown arrangements worked well and the submarine surfaced safely.

One of the issues that arose about the operations of the *Collins* class was the growing shortage of trained personnel, as so many of the top highly trained technical petty officers chose to leave the Navy for better pay and more time at home. A package was put in place to hold these key personnel and, on 10 November 2010, the Minister for Defence, Hon Stephen Smith, said the problem was well on the way to being overcome.

The *Collins* class submarines have gradually got better and better with each refit, and with more Australian contractors gaining experience. The ASC itself has gone through several stormy periods and many confrontations with the naval and other defence personnel. As Yule and Woolner wrote in their history of the *Collins* class:

“Perhaps the greatest irony of the project is that the crisis of the late 1990s paved the way for not only building another class of submarines in Australia, but designing them here as well.”

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**HMAS Farncomb** sails for a media day from the Port of Albany.

**HMAS Collins** arrives in Sydney Harbour.
THE NEXT SUBMARINE GENERATION

Planning has been in hand in the Navy and the government for some years as to whether and what type of submarine fleet would be best for the future. In the 2009 White Paper, a fleet of 12 submarines was recommended, which prompted vigorous debate over the role, the number, the type and whether the submarines would be built in Australia or brought in from overseas. It is well accepted that Australia requires capable, state-of-the-art submarines that can travel long distances to patrol areas far afield. These must further carry potent weapons and sensors, and be able to operate independently for long periods. Australia also needs systems in place to train, equip, support, maintain and develop these vessels throughout their service. While no existing design closely matches these needs, a skilled submarine civil and naval workforce has been built up over recent decades, and the next generation of submarines will likely be designed and built in Australia.

One of the major design issues is the need for an air independent propulsion system. This will avoid the reliance on diesel engines in operations and exercises where modern and expected future detection systems will easily detect the submarine. Nuclear propulsion would perhaps be more viable with modern small reactors than older large ones.

From left: Leading Seaman Stores Naval Stuart Shepherd (HMAS Dechaineux), Able Seaman Cook Kylie Cox (HMAS Collins) and Leading Seaman Acoustic Warfare Analyst Submariner Daniel McLellan (HMAS Waller) on Diamantina Wharf as Dechaineux sails for sea.