THE AUSTRALIAN NAVAL ARCHITECT

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Cover Photo:
Manouevring demonstration of Sentinel Boats' 1100 designed by One2three Naval Architects in HDPE construction
(Photo courtesy Sentinel Boats)

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FROM THE DIVISION PRESIDENT

Extending my warm greetings to all RINA members and the wider maritime community of Australia, I welcome all to this edition of *The Australian Naval Architect* (ANA).

The new financial year 2026-2027 has gained a 'full ahead' momentum offering new challenges and opportunities for everyone. Earlier in May 2026, our Secretary Dr. Stuart Cannon and I attended Indian Ocean Defence & Security Conference & Exhibition (IODS) held in Perth from 26th to 28th of May, which is emerging as the second largest platform attracting industry, government and academia on the topic of maritime defence and security after IMC International Maritime Conference. IODS (see report in Industry & General News) drew 9,795 attendances which included 6.6% international attendance from 36 nations and 259 participating exhibitor companies. This poses a significant opportunity for RINA to consider and we will be evaluating the proposition of materialising this opportunity in the future.

Driving one of my strategic priorities – Advocacy for the Naval Architects – I contributed to an industry networking event as the guest speaker where I introduced RINA and provided an awareness about the role of naval architects in the existing and future landscape of Australia's defence shipbuilding program, and in the wider maritime industry. The event was organised by 'WA Defence Review' on 22nd of July and attended by more than 60 people from 55 organisations representing a broad range of industries including maritime, defence, energy, resources, manufacturing, construction and legal. The message was very well conveyed and attracted a lot of interest from the audience.

We have a number of exciting events happening in the upcoming months. These start with Warship 2026: Scaling the Fleet Conference to be held by RINA HQ in Perth from 30th of September to 1st of October (see advert p.5). Alongside this conference RINA HQ team intends to organise a networking event for the members which is in the planning phase and its details will be shared once finalised. Furthermore, we are anticipating that our CEO, Mr. Paul Jobson, will also be attending this conference. Considering these exciting opportunities, I highly recommend participating or attending Warship 2026 conference.

Another important event I am looking forward to attend is Safe Ships Safe Ports Forum (SSSP) to be organised by Pilbara Ports from 20th to 21st of October in Perth. SSSP, since its inception in 2016, has emerged as one of Australia's significant maritime safety conferences attracting international participation as well. I am keen to explore the opportunities which SSSP can offer for RINA Australian Division and how we can increase our presence in the Australian commercial shipping and ports sector. I am also looking forward to meeting our members in SSSP.

Sammar Abbas

In a pursuit to bring an alignment with the strategic objectives and key priorities of RINA HQ, I requested our CEO, Mr Paul Jobson, to address our Division Council and share his plans to achieve those strategic objectives. He has accorded his consent and we are expecting an interactive online session with him later this month.

Under my strategic priority of membership value, I am planning to launch an awareness campaign for our members to learn about the latest pathways available to become a Chartered Engineer (CEng) through RINA. I am in communication with RINA HQ where some of our Division Council members and Sections' office bearers will be receiving appropriate training before conducting awareness sessions across all Sections.

I specially thank our highly capable and dedicated team of editors who produced another fabulous edition of *ANA*.

I wish everyone a great spring season ahead and will get back with more updates in the next issue.

Sammar Abbas CEng MRINA

australiandivision@rina.org.uk

EDITORIAL

It is timely to examine the developments regarding the proposed Australian submarine capability and in particular nuclear-propelled submarines subsequent to this column in last February's issue of this journal.

In terms of announcements there has been nothing beyond Ministerial statements implementing the "optimum path" previously set out for the acquisition of submarine capability under the AUKUS agreement. These announcements have been:

- On 10 April 2026, $6.9 million to go towards supporting priority sustainment services to the UK submarines participating in the Submarine Rotational Force – West (SRF-West) activities. This is additional to the $14 million allocation for the similar US submarine support program.
- On 15 May 2026, the Government announced Lockheed Martin Australia as the preferred Combat System Integration Partner for Australia's future fleet of sovereign Virginia class submarines.
- On 19 May 2026, the first Collins-class life of type extension (LOTE) to be of HMAS *Farncomb*, commencing at the end of May, at cost of $11 billion across the Collins-class fleet.
- On 12 June 2026, investment of up to $8 billion to expand SRF-West at HMAS *Stirling*.
- On 24 July 2026, a further $4.6 billion investment in Australian Naval Infrastructure (ANI) for the NuclearPowered Submarine Construction Yard at Osborne. This allocation is additional to the $3.9 billion announced in February.
- On 29 July 2026, Bisalloy Steel has received a purchase order from US shipbuilder General Dynamics Electric Boat (GDEB) valued at approximately US$2 million for HY80 Australian-made steel plate to support the production and construction of Virginia-class submarines.
- On 29 July 2026, Leidos Gibbs and Cox Australia selected to lead the preliminary design for a contingency dry dock in Western Australia to ensure Australia is ready to undertake critical repairs and maintenance for the nation's future nuclear-powered submarines from the early 2030s.

Additionally, the then U.K. Defence Secretary announced on 12 June 2026 that first steel for the first (U.K.) SSN AUKUS submarine would be cut next year. From the U.S. perspective Newport News Shipbuilding and General Dynamics Electric Boat were reported on 3 August as having been awarded contract modifications worth approximately US$76.6 billion ($108.9 billion) to respectively construct nine Block VI Virginia Class attack submarines and five Build II Columbia Class ballistic missile submarines for the United States Navy, alongside significant investment in shipyard infrastructure and workforce expansion.

Although these announcements indicate continuation of the optimum path for Australia's acquisition of nuclear propelled submarines, they do nothing to allay concerns expressed in the press regarding:

1. The capability of Defence and its support industry to simultaneously sustain the classes involved in the optimum path, namely Collins-class, LOTE Collins-class, Virginia- class and SSN-AUKUS.
2. The high probability that Collins-class LOTEs will not sufficiently extend the life of these vessels to fill the potential capability gap before Australia takes possession of used Virginia-class vessels.
3. The possibility that the build rate of United States nuclear submarines has not increased sufficiently by 2032 for the U.S. to be able to spare Virginia-class submarines for sale to Australia.
4. The possibility that the U.S. President in 2032 could also refuse to proceed with the sale for strategic reasons if the uncertainty of whether Australia would task them in support of U.S. strategic initiatives is considered to be too high a risk or that the Virginia-class vessels under Australian flag would be less use to the U.S. as an allied vessel due to carrying only conventional armaments.
5. The high probability that production by the U.K. of SSN-AUKUS design submarines will be delayed and that this may lead to delay in the delivery of Australian-built SSN-AUKUS vessels.
6. That delays in the U.K. lead to the first Australian-built SSN-AUKUS submarine becoming the first-of-class, and therefore carrying the increased risk of that first-of-class status in addition to risks flowing from being the first vessel produced by ASC in 20 years and particularly from the new Osborne shipyard.

Australia would appear to have little or no control over all but the first two of these concerns. However the public statements by Minister Conroy on 29 July 2026 that the arrangements for U.S. submarines to rotate through Submarine Base West only until 2032 may be an attempt to apply pressure in relation to the third and fourth listed concerns.

In the absence of any publicly-aired "Plan B" to the optimum path, there is a risk that if any, let alone all, of the listed concerns eventuate Australia will have a submarine capability gap of greater or lesser extent that may last for more than 20 years. Such a gap is hardly in Australia's strategic interests notwithstanding the protection expected to be provided by acquisition and deployment of UUVs, especially XLUUVs such as Ghost Shark.

Press reports have speculated that all but the first of the listed concerns could be addressed by introduction of a further class to cover the capability gap, such as leasing conventional submarines from friendly countries such as Japan or Republic of Korea. But such a measure would add an extra class to be sustained under the first of the listed concerns.

The potential capability gap is of course a national concern, but what does all of this uncertainty mean for naval architects and other engineers?

We engineers have important roles in not only designing but also building and sustaining submarines. And we all know that the requisite knowledge and experience in our specialty is not gained overnight - the experience part in particular

is important in knowing what can go wrong and in putting in place preventative measures to ensure the safety of the submarine(s) and their crew.

This all points towards the urgent task of recruiting young engineers into our profession to ensure that the necessary skills are available when required for not only Australia's future submarines, whatever path might eventuate from the concerns and potential roadblocks outlined above. As a starting point, UNSW should remove its blockage on the enrolment of civilian students in the naval architecture course at UNSW Canberra campus, noting that this blockage acts as an impediment to the viability of the course beyond the short term.

Thankfully the paths forward for the other elements of Australia's naval shipbuilding program and vessel sustainment are much more certain, as are the submarine building programs of the other AUKUS partners. But, together with the submarine program, the Australian build of naval surface ships will also need many more young professionals to oversight their implementation through sound engineering. We look forward to positive signs that this technical workforce development is happening rather than being another element of an uncertain future.

Rob Gehling

EDITORIAL NOTE

The news columns of this journal are mostly comprised of items replublished from news outlets with no or minimal editorial changes. The Editors therefore cannot take any responsibility for the accuracy of information provided or claims made therein.

COMING EVENTS

ACT Section

Meetings are typically hosted by UNSW Canberra at their Reid campus and streamed online where possible.

2 Sep Dr. Hayden Lee, *Risk Based Approach to Margins Management*

NSW Section

Technical presentations are generally combined with the ACT & NSW Branch of the Institute of Marine Engineering, Science and Technology and held on the first Wednesday of the month (February through October). Activities start at 18:00 for refreshments and 18:30 for the presentation, and finish by 20:00. Guests are welcome.

2 Sep Yi-Ting Tsou *Development and Validation of Vision-based Underwater Tracking System*

7 Oct Graham Brown *Underwater Robotics*

Qld Section

The Queensland Section is planning to conduct technical presentations in August, October and November (combined with End-of-Year function). The August technical presentation at 6pm in the AUS Ships Group offices is:

20 Aug *Aus Ships Group Emissions Reduction Journey*

SA/NT Section

No technical presentations have been announced at time of closing for publication.

Tasmania Section

Technical Presentations. Presentations typically commence at 6:00 pm, where possible, and are scheduled on the following dates, generally aligning with the second Thursday of each month. Attendees are welcome to join in person in Hobart (Derwent Sailing Squadron) or Launceston (AMC Auditorium) with these venues alternating in hosting the speaker, and the alternate venue and other participants joining online via a Zoom link, which is circulated in advance of each session.

13 Aug Fred Barrett *The Art and Science of Rating Rule Optimisation*

10 Sep TBA

8 Oct Roger King *Salvage and wrecks with legal perspective, stakeholders, a few scenarios*

WA Section

The next Technical Presentation is the first in establishing a relationship with the Fremantle Sailing Club (FSC) in their regular presentations referred to as "Topic Night". Due on 20 August is Wind Power with presentations from Ken Goh on the wind propulsion industry and the market plus a presentation from Greg Johnston from Advanced Wing Systems updating their technical development and commercialisation.

A series of site visits is being developed for the remainder of 2026 including Svitzer Tugs plus the simulator and also Versatile Marine for their LSAM (Large Scale Additive Manufacturing).

RINA Warships 2026: "Scaling the Fleet- Delivering Added Mass with Affordable Minor Warships 30 Sep - 1 Oct 26, Perth, WA

Exciting news announced during I-PAC 25 was that, after the success of Warships2024 conducted in Adelaide, RINA HQ has decided to conduct their internationally recognised Warships conference in Perth, WA from 30 September to 1 October 2026 at the Optus Stadium, Burswood.

Topics will include:

- Integration of Minor Warships
- Technology to improve availability
- Autonomous Systems
- Blend of crewed/uncrewed – Optionally Crewed Systems
- Lean crewing
- Tech advancement
- More sustainable build techniques

WARSHIP 2026
Scaling the Fleet

Following the success of Warship 2024, with over 230 delegates, Warship 2026 is back in Australia, bringing together international experts in naval design, engineering, and innovation. The conference will focus on delivering affordable, capable minor warships and the latest technical developments shaping future fleets.

The event attracts defence professionals, industry specialists, academics, and technology experts. Delegates will hear from leading speakers, join technical discussions, and connect with fellow professionals from around the world.

Why Attend

Warship 2026 offers a unique opportunity to engage with the forefront of naval innovation:

- Discover the latest technologies and strategies for minor warships
- Join expert-led discussions on fleet development and innovation
- Connect with defence, industry, and academic leaders worldwide
- Gain insights into trends shaping the future of naval capability

Topics (including but not limited to):

- Integration of Minor Warships
- Technology to improve availability
- Autonomous Systems
- Blend of crewed/uncrewed – Optionally Crewed Systems
- Lean crewing
- Tech advancement
- More sustainable build techniques

30th Sept 2026 - 1st Oct 2026
Perth, Australia

THE ROYAL INSTITUTION OF NAVAL ARCHITECTS

Event Partner

BMT

NEWS FROM THE SECTIONS

NSW Section

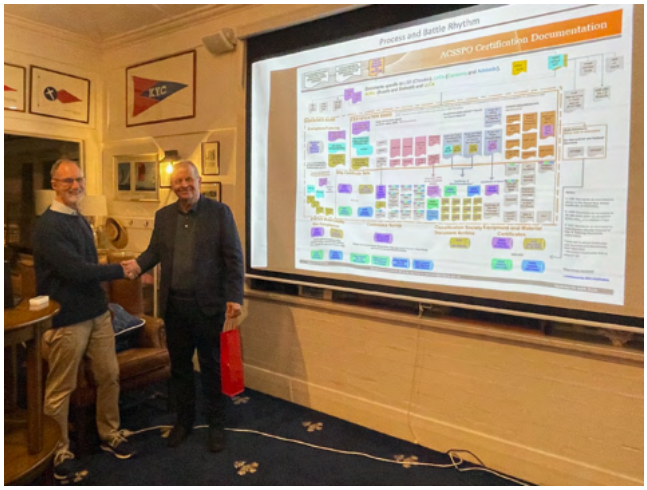
Flow Control Engineering and Maintenance Services to Defence

Gareth Jones delivered a presentation on Wednesday 3 June about Marley Flow Control, an Australian-owned engineering company specialising in cooling tower manufacture and maintenance, flow control engineering, large-scale fan production, defence services, and facilities maintenance. Established in 2005, its roots trace back to Cooling Towers NSW (2002–2005), and it has steadily grown into a trusted partner for industries across Australia and New Zealand.

Gareth also explained how Marley Flow Control is now a preferred provider of cooling tower repair and maintenance services for leading organisations, including contracts with Brookfield Global Integrated Services and Spotless to maintain fuel storage facilities for the Australian Defence Force. Its reputation is built on delivering reliable, compliant, and innovative solutions that meet the highest industry standards.

Technical In-Service Certification of RAN Ships

In-service certification of a naval vessel refers to the process of verifying that a ship remains safe, seaworthy, combat-capable, and compliant with accepted standards throughout its operational life. Due to the demanding operational schedule of a naval vessel, in-service certification presents unique challenges. This presentation on 1 July by Deane Kos outlined the challenges in Class, Statutory and RAN/DoD certification of RAN Amphibious and Combat Support Ships.



Adrian Broadbent thanks Deane Kos

What does it mean to be a Maritime Professional?

A maritime professional is a highly skilled, adaptable individual dedicated to the safe, efficient, and sustainable operation of our ships. Captain Philip (Paddy) Parvin RN (Rtd) gave an illuminating presentation on the challenges underpinning the roles of a maritime professional on 7 July with many practical examples. Their roles in bridging technical expertise, crisis management and strict regulatory compliance predominate, whether they work at sea on vessels or ashore in port operations, logistics, or engineering. The presentation explored a wide range of key ideas and insights on what being a maritime professional entails.

Ehsan Khaled from Presentation notices

Digital Dock: Keel Block Optimisation and Dry Dock Digitalisation for Robotics-Enabled Docking at the Captain Cook Graving Dock

Dr William Jones provided a thorough presentation on the Digital Dock implementation, conducted live at the Royal Price Edward Yacht Club, and to online viewers, on 5 August.

Naval readiness depends on the efficient turnaround of vessels through dry dock maintenance. At Garden Island's Captain Cook Graving Dock, preparing the dock for an incoming vessel requires the repositioning of large keel blocks, a process that is currently manual, labour-intensive, and time-consuming. As a critical naval maintenance asset, the dry dock must support increasingly demanding maintenance schedules, where any reduction in setup time can create more usable time for inspection, repair, and return-to-service activities.

In partnership with Thales Australia, the Australian Robotic Inspection and Asset Management Hub is developing a digital dock capability that uses optimisation, robotics, sensing, and digital twins to improve planning and reduce setup time between dockings. This presentation described the current state of the project, including the prototype planning application that can generate optimised block transition plans for dock operations teams. It outlined the longer-term vision of integrating robotic platforms, live dock-state monitoring, and autonomous material handling systems so that dry dock preparation can become faster, more reliable, and increasingly automated. The talk demonstrated the operator aid software developed to date and discussed the pathway to fully autonomous robotics-enabled docking and improved fleet availability.

Beyond block positioning, the digital dock vision extends to robotic inspection and rapid 3D reconstruction of vessels and dock infrastructure. Mobile, aerial, underwater, and confined-space robotic platforms can be used to scan vessels before, during, and after docking, creating up-to-date digital models that support maintenance planning, condition assessment, and safer access to difficult environments. Together, these capabilities point toward a more integrated future dry dock: one where sensing, planning, optimisation, and robotic execution work as a connected system to improve productivity, reduce uncertainty, and strengthen fleet sustainment across naval and commercial operations.

The presenter, Dr William Jones, is a Research Fellow in Planning and Optimisation at the Australian Robotic Inspection and Asset Management (ARIAM) Hub, University of Sydney. He leads the Digital Dock and Keel Block Optimisation programme with Thales Australia at Garden Island's Captain Cook Graving Dock, applying task and motion planning, robotics, and digital twins to improve dry dock operations and naval readiness. His work bridges operations research and field robotics, translating algorithms into practical tools for crews today and autonomous systems tomorrow.

Trevor Ruting

Tasmania Section

Annual General Meeting (AGM) Tasmanian Section

The Tasmanian Section held its Annual General Meeting (AGM) on 21 May 2026. During the meeting, the following members were appointed to serve in the respective positions for the 2026–2027 term:

- Chair – Richard Boult
- Deputy Chair – Gregor Macfarlane
- Secretary – Martin Renilson
- Treasurer – Chris Davies
- Publicity Officer – Nipuna Rajapaksha
- Student Representative – James Curr

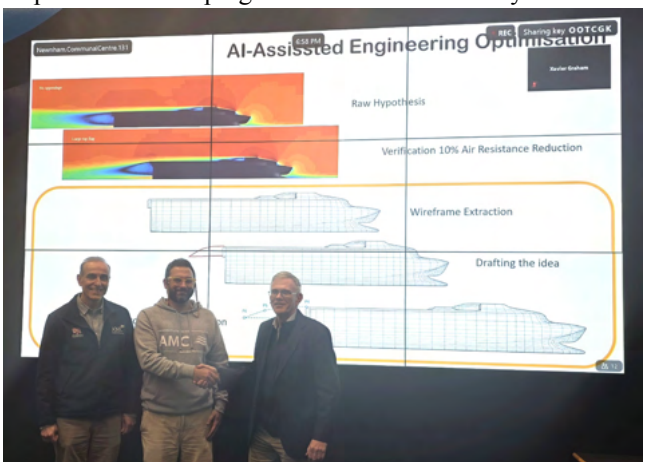
Technical Presentations

The Tasmanian Section maintained an active program of technical presentations throughout the year, with events held alternately in Launceston and Hobart to foster collaboration and strengthen connections between industry and academia. A summary of the presentations is provided below.

Crewed or Screwed? AI and the Future of Maritime Skills

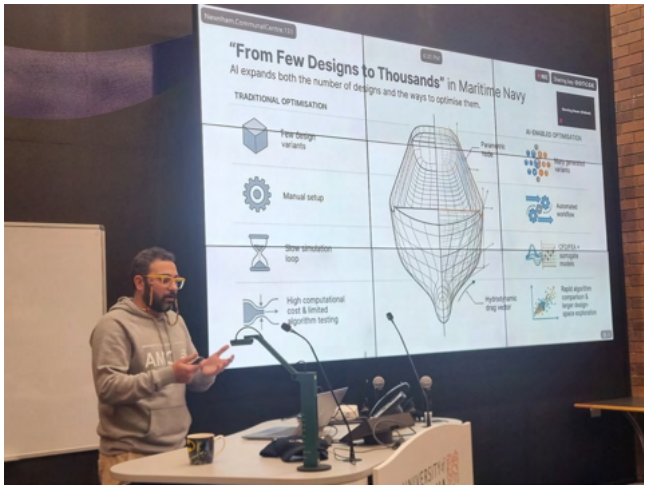
Dr Hamed Majidiyan delivered a most informative and challenging presentation in Launceston on AI's rapid advancement. AI dominates daily headlines, with corporations like Amazon and Meta announcing significant workforce reductions. AI systems are increasingly replacing human workers across industries by automating routine tasks with greater speed, consistency, and cost-effectiveness.

While the maritime industry may appear insulated from this technological disruption, the reality is far less certain. The extent to which AI will reshape maritime operations, and which roles and skill sets will be most vulnerable or most resilient, remains an open question. Understanding where the frontline of this transformation lies is critical for those responsible for shaping the future of the industry.



Dr Hossein Enshaei (Left) and Martin Renilson, Tasmanian Section Secretary (Right) expressing appreciation to Dr Majidiyan following the presentation.

This presentation addressed that uncertainty by presenting a clearer picture of AI's potential impact on the maritime workforce skills. In doing so, it identified not only the roles at greatest risk, but also those likely to grow in importance as the industry evolves. It is hoped that the insights shared during the presentation will serve as a resource for decision-makers in both academia and industry, supporting more informed and forward-looking planning.



Dr Hamed Majidiyan delivering his presentation

Nipuna Rajapaksha

WA Section

WA Section AGM

The WA Section AGM was held 27 May 2026 via MSTeams given the geographical spread of the WA members. A report from Ken Goh, Chair WA Section, was given via MSPowerpoint covering the past 12 months plus a look ahead to future activities. The financial report was tabled by Hadiqa Khan. All actions were considered up to date.

Committee Meeting 5 May

A Committee Meeting was held on 5 May in the run-up to the WA Section AGM and again more recently on 2 July 2026. The changes in the Committee from the WA Section AGM are settling. The technical presentation series, site visits and suitable venues remain the focus for the Committee to deliver membership value.

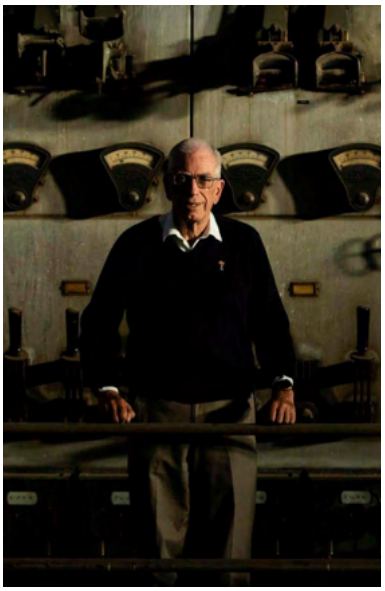
Mal Waugh

The Naval Historical Society of Australia

ABN 71 094 118 434

Patron: Chief of Navy

Honouring History



JOHN JEREMY MEMORIAL ESSAY COMPETITION 2026

The Naval Historical Society of Australia aims to promote knowledge of and interest in Australia's rich naval history. This essay competition is named in honour of John Jeremy, our long-standing Vice President of the NHSA, naval architect, shipbuilder, historian, author, editor, yachtsman, photographer and an inspiration to all who met him.

Original thinkers are sought who, through their work or studies can promote discussion around Australian naval history and its implication for the future of Australia.

The winning essays and honourable mentions will be published in The Naval Historical Review.

The competition is conducted in three divisions as follows.

1. Professional Division: Includes Journalists, Defence Officials, Academics, Naval Personnel and previous contributors to Naval Historical Review.
2. Adult Novice: Non-professional adults over 18 years of age not working as a professional.
3. Senior Students: Students aged 16 to 18 years of age.

Professional and Adult Novice entries should be 2,500 to 3,000 words in length.

Prizes	1st Place	2nd Place	3rd Place
Professional	$1,500.00	$500.00	$200.00
Adult Novice	$1,500.00	$500.00	$200.00
Senior Students	$1,500.00	$500.00	$200.00

Highly Commended Entries

At the organising committee's discretion additional non-monetary awards may be made. These could take the form of book prizes, Sydney Harbour naval history cruises and ship or establishment visits subject to RAN approval.

Deadline Friday 16 October 2026.

Scan to access more information on our website
www.navyhistory.au

Saronic and Lloyd's register to partner on autonomous maritime systems

Saronic has announced a strategic partnership with Lloyd's Register (LR), a leading provider of classification and compliance services for the marine and offshore industries. This collaboration brings together Saronic's expertise in proven autonomous maritime systems and LR's authority in maritime standards and certifications to advance the safe, scaled deployment of maritime autonomy in the United Kingdom, Europe, and Australia. As governments and regulators continue to define how autonomous vessels can be safely deployed and operated across maritime environments, close collaboration between commercial industry and trusted assurance organisations is critical.

Saronic and LR will work together to advance practical rules, technical standards, and guidance for maritime autonomy, pursuing opportunities for coordinated technical engagement and collaboration with relevant regulators and authorities. The partnership aims to ensure that regulatory approaches keep pace with innovation while maintaining the highest standards of safety and operational reliability at sea.

Under the partnership, Saronic will also pursue classification activities for its autonomous surface vessels (ASVs) with LR, ensuring its vessels meet rigorous safety, security, and performance standards expected by commercial operators and naval leaders alike. LR will support the verification and certification of Saronic's systems within recognised maritime frameworks while helping to define credible classification pathways for this emerging and rapidly evolving category of maritime systems.

Dino Mavrookas, Co-Founder and CEO of Saronic Technologies, said:

> Autonomy is fundamentally reshaping maritime operations, and as Saronic expands its presence across the United Kingdom, Europe, and Australia, we are excited to partner with Lloyd's Register, a leading authority on maritime safety and sustainability. Working together in these key markets, we are committed to ensuring our autonomous maritime capabilities meet a high bar for safety and security while aligning technological innovation with forward-looking frameworks that build trust and confidence in the safe operation of this emerging class of vessels.

David Lloyd, Vice-President Naval and Government Business at LR, said that Maritime autonomy is moving rapidly from concept to operational reality, creating significant opportunities across defence, security and commercial markets. As autonomous and uncrewed vessels become more capable and more widely deployed, the industry needs trusted assurance frameworks that give operators, regulators and governments confidence in their safety, reliability and performance. David Lloyd said:

> Through this partnership with Saronic, LR is helping to shape the standards, verification pathways and regulatory approaches needed to support the safe and scalable adoption of marine autonomous vehicles.

Saronic has rapidly scaled its operations since its founding in 2022, backed by $2.6 billion in private capital to advance autonomous maritime systems and the production capacity required to deliver them at speed and scale. This growth has been matched by Saronic's unwavering commitment to safety, regulatory compliance, and secure operations across every platform and technology in the product portfolio.

LR Press Release *18 May 2026*

IMO Approves International Gas Code 2028 Amendments

Significant amendments to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) are expected to come into force on 1 July 2028. This follows their approval at the 111th session of the IMO's Marine Safety Committee (MSC 111) in May and are due to be adopted in December 2026.

The amendments cover a variety of issues, including:

- Clarification of the application of the "one ship, one code" discussion in relation to the use of alternative fuels on board gas carriers under the provisions of the IGC Code.
- Application of finite element analysis to type C tanks.
- Carriage of CO_2 cargoes and the use of LPG, ethane and toxic cargoes as fuel.
- Enhancement and clarification of Causes and Effects Matrix of an ESD (Emergency Shut Down).
- Cargo tank filling limits.

Applicability

The IGC Code amendments apply to existing and new ships as appropriate. However, if an amendment requires changes in a ship's design or construction, that amendment will only be applicable to ships constructed on or after 1 July 2028. Consequently, a three-date application system has been agreed that defines "new ships" as those for which:

- The building contract is placed on or after 1 July 2028; or
- In the absence of a building contract, the keels are laid or which are at a similar stage of construction on or after 1 January 2029; or
- The delivery of which is on or after 1 July 2032

Certificate of Fitness

To reflect this three-date application system, revisions have also been approved for the form of the International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk of the IGC Code. MSC 111 confirmed that only products listed in Chapter 19 of the IGC Code should be included in the ship's International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk and identified as cargo and/or fuel, as appropriate in the revised table of the Certificate of Fitness.

Unified interpretations

When the approved IGC Code amendments come into force, the following IMO unified interpretations will no longer apply to new ships constructed on or after 1 July 2028:

- MSC.1/Circ.1543
- MSC.1/Circ.1559

- MSC.1/Circ.1590
- MSC.1/Circ.1606
- MSC.1/Circ.1617
- MSC.1/Circ.1625
- MSC.1/Circ.1651
- MSC.1/Circ.1669
- MSC.1/Circ.1679

The above will remain in effect for existing ships constructed prior to 1 July 2028.

Lloyds Register Class News 10/2026 *12 June 2026*

Lloyds Register Group announced next Chairman of the board

Lloyd's Register Group (LR) and Lloyd's Register Foundation (The Foundation) are delighted to announce the appointment of the new chair of its boards. Matthias Altendorf will succeed current chair Thomas Thune Andersen when he leaves the role at the end of his tenure in June 2027. Matthias Altendorf, 59, brings a wealth of experience as both an executive and non-executive director across a number of high-profile organisations. He enjoyed a distinguished career of almost four decades with the Swiss-based Endress+Hauser Group, including serving as CEO from 2014 to 2023 and subsequently chairing its Supervisory Board.

Matthias Altendof
(Photo courtesy Lloyd's Register)

Beginning his career as a toolmaking apprentice, Matthias worked his way through the organisation to lead the global, family-owned engineering business specialising in process and measurement technology – helping clients to ensure precision, quality and safety in the products they manufacture. This included the shipbuilding, and both offshore and onshore markets where he was a strong advocate of digitalisation and connected solutions. Through that experience, he brings to LR's Power of Three proposition a combination of industrial leadership, digital expertise and customer focus that strengthens its ability to connect class, digital and advisory capabilities across vessel, voyage and people.

He is also the founder of Bionic Leadership, a company which focuses on developing human-centred management to pioneer evolutionary approaches to leadership and economic social systems.

LR Maritime News *29 June 2026*

Latest Bureau Veritas (BV) Rules and Guidance Notes

The following is a list of the latest releases of BV Rules and guidance notes available from their website:

NR476	Rules for the classification of steel ships (July 2026)
NR675	Ships equipped with SMART systems (July 2026)
NR480	Approval of the manufacturing process of metallic materials (July 2026)
NR615	Buckling assessment of plated structures (July 2026)
NR647	LPG-fuelled ships (April 2026)
NR266	Requirements for survey of materials and equipment for the classification of ships and offshore units (March 2026)
NR600	Hull structure and arrangement for the classification of cargo ships less than 65 m and non-cargo ships less than 90 m (March 2026)

BV Marine Classification website *10 July 2026*

DNV Issues new Class Rules and Standards for ships and offshore

The July 2026 edition of DNV's rules and standards for the classification of ships and offshore units will enter into force on 1 January 2027.

Following a hearing process, 92 documents have been published. New class notations include Shore power ready and Battery ready as well as qualifiers to existing notations such as ER (ULEV). For both ship and offshore class, the FL notation specifies the design fatigue life under defined operating conditions.

Notable additions and changes to the DNV ship rules (DNV-RU-SHIP) include the following:

New class notations:

- FL(Y, E) giving the design fatigue life under specified operating conditions (Pt.6 Ch.1 Sec.17)
- Battery ready for vessels prepared for batteries as part of the main energy onboard installation (Pt.6 Ch.2 Sec.1)
- Shore power ready for vessels prepared for shore power installations (Pt.6 Ch.7 Sec.5)
- New qualifiers to existing class notations:
- Tanker for liquefied gas (FSM) for vessels designed to store and transfer liquefied gas (Pt.5 Ch.7 Sec.25)
- Fish carrier (without qualifier) requirements for vessels carrying non-live fish (Pt.5 Ch.10 Sec.18)
- VCS(P , X kN/m2) for vapour control systems on vessels with high-pressure cargoes (Pt.6 Ch.4 Sec.11)
- Gas bunker(LNG, LPG, NH , ETH) specifying the type of gas which may be handled (Pt.6 Ch.5 Sec.14)

- BCLIQ(Partial) introducing the possibility of utilizing selected holds only for cargoes that can liquefy (Pt.6 Ch.5 Sec.18)
- ER(ULEV) for vessels with ultra-low emissions (Pt.6 Ch.7 Sec.7)

Other important changes:

- Structural arrangement: reduced corrosion margins for cargo tanks; simplified and relaxed requirements to cut outs in stiffeners (Pt.3 Ch.3)
- Fire safety: discontinued the class rules as this is fully addressed through statutory certificates (Pt.4 Ch.11)
- Service vessels: relaxed requirements for ice accretion on superstructures; removed requirements for Level 2-site DP capability plots for Windfarm service; relaxed the requirements for the arrangement of cargo rails (Pt.5 Ch.9)
- **Icebreaker:** changed the rules to improve flexibility of design of collision bulkhead and forebody below the collision bulkhead (Pt.5 Ch.10 Sec.10)
- Direct analysis of ship structures: modified and reduced the calculation scope (Pt.6 Ch.1 Sec. 6 and Sec. 7)
- **Gas-fuelled hydrogen:** rules concept amended to better fit the safety concept of the MSC Interim guideline (Pt.6 Ch.2 Sec.16)

Main changes to offshore class:

- New class notation FL(Y) specifying design fatigue life (DNV-RU-OU-0101, OU-0102, OU-0103 and OU-0104)
- FMS notation updated with qualifiers for selecting design fatigue factors and fatigue life (DNV-RU-OU-0101, OU0102, OU-0103 and OU-0104)
- New class notation NUI for normally unmanned installations (DNV-RU-OU-0102 and OU-0103)
- Rewritten in-service class scope for floating wind farms (DNV-RU-OU-0512)
- Restructured DNV-OS-A101 to separate common requirements from service-specific requirements, and added options for other fuels

The updated rules may be applied to projects contracted before the entry-into-force date provided all parties agree. DNV publishes one main rule edition annually, with the next edition scheduled for release in July 2027. Occasionally, additional amendments may be issued between the main editions. These amendments are announced in the Rules & Standards Explorer.

News from DNV *July 2026*

Revised requirements for pilot transfer arrangements

The IMO has published amendments, to the SOLAS regulation V/23 related to pilot transfer arrangements, in IMO Resolution MSC.572(110). The main change is that the regulation mandates new associated performance standards, IMO Resolution MSC.576(110) - Performance Standards for Pilot Transfer Arrangements, whereas previous performance standards were recommended.

Application of requirements

As per IMO Resolution MSC.572(110) the performance standards for inspection, stowage, maintenance, replacement and familiarisation of pilot transfer arrangements apply as follows:

- For all pilot transfer arrangements, regardless of installation date: must comply with the introduction and parts D and E of the resolution from 1 January 2028.
- Pilot transfer arrangements installed on or after 1 January 2028*: must comply with the new performance standards from 1 January 2028.
- Pilot transfer arrangements installed before 1 January 2028* on SOLAS certified ships: must comply with parts A, B and C of the resolution not later than the first survey** on or after 1 January 2029.
- Pilot transfer arrangements installed before 1 January 2028* on non-SOLAS certified ships: must comply with parts A, B and C of the resolution not later than 1 January 2030.

**Note 1: the expression "installed on or after 1 January 2028" means a contractual delivery date for the pilot transfer arrangement or, in the absence of a contractual delivery date, the actual delivery date of the arrangement to the ship on or after 1 January 2028.*

*** Note 2: the term "first survey" means the first annual survey, the first periodical survey or the first renewal survey, whichever is due first after the date specified in the relevant regulation or any other survey if the Administration deems it to be reasonable and practicable, taking into account the extent of repairs and alterations being undertaken. For a ship under construction, where the keel is laid before, but the ship is delivered after the date specified in the relevant regulation, the initial survey is the "first survey".*

Impact of changes

The SOLAS regulation V/23 pilot transfer requirements were last updated for new installations after July 2012. The latest mandatory performance standards, Res MSC.576(110), apply retroactively and include the 2012 changes to SOLAS Regulation V/23, as well as other new requirements. Consequently, vessels with pilot transfer arrangements installed before July 2012 may need more modifications than newer vessels to comply with the latest requirements.

The following is a non-exhaustive list of the more significant changes that impact existing ships in the revised requirements:

For installations before, on or after 1 July 2012:

- All strong points on deck for pilot ladders, manropes and "means of securing a pilot ladder at intermediate lengths", are required to have a breaking strength of not less than 48kN. Strong points shall have breaking strength or equivalent safe working load limits clearly and permanently marked. Documentation of the conformance of the strong points, shackles and securing ropes shall be maintained on board and available for inspection purposes. (Part A, paragraph 6.1).

- At least one spare compliant pilot ladder and one spare set of compliant manropes shall be carried on board the ship. (Part D, paragraph 29).
- Pilot ladders and manropes, including their spares, shall be removed from service within 36 months after the date of manufacture or within 30 months after the date of being placed into service, whichever comes first. (Part D, paragraph 30).
- If a pilot ladder is to be stowed on a pilot ladder winch reel, the drum diameter shall be not less than 0.16m and the drum shall be provided with sunken securing points. (Part C, paragraph 16).
- Accommodations ladders used for pilot transfer, which are fitted with a trapdoor in the lower platform, have significant new requirements. (Part A, paragraph 5.5).
- Where rubbing bands or other constructional features prevent the safe approach of a pilot boat, these shall be cut back to provide at least 6m of unobstructed ship's side. (Part A, paragraph 10).
- New installations of pilot ladders, including the "means of securing the pilot ladder at intermediate lengths", and manropes shall be type-approved by the flag Administration (or a Recognised Organisation) in accordance with the performance standards. (Part F, paragraph 36).

For installations before 1 July 2012:

- Accommodations ladders used for pilot transfer shall have sufficient length to ensure that their angle of slope does not exceed 45°. (Part A, paragraph 5.1).
- Means are to be provided to secure the lower platform of any accommodation ladder used for pilot transfer firmly to the ship's side. (Part A, paragraph 13.1.3).
- When a combination arrangement is used for pilot access, means are to be provided to secure the pilot ladder and manropes to the ship's side at a point nominally 1.5m above the bottom platform of the accommodation ladder. (Part A, paragraph 13.1.5)

Safety certificates and records

IMO amendments have also added new sections relating to pilot transfer equipment in the following safety equipment related records:

- Record of Equipment for Cargo Ship Safety (Form E or C)
- Record of Equipment for Passenger Ship Safety (Form P)
- Record of Equipment for the Special Purpose Ship Safety Certificate (Form SPS)
- Record of Equipment for High-Speed Craft Safety Certificate

This will necessitate them being reissued and updated after 1 January 2028. For details, see IMO resolutions MSC.572(110), MSC.573(110), MSC.574(110) and MSC.577(110).

What shipowners and managers should do now

Please review the new IMO amendments to SOLAS Regulation V/23 to ensure continued compliance of existing vessels. For vessels classed with LR, kindly arrange for submission of plans for approval by LR, detailing any necessary modifications, well ahead of the required compliance date on the first survey on or after 1 January 2029.

For further information

The IMO has published MSC.1/Circ.1428/Rev.1, containing illustrations of arrangements which are compliant with the new performance standards.

For technical queries related to this subject, please contact statutorysupport@lr.org.

Lloyd's Register Class News 13/2026 30 July 2026

ACKNOWLEDGEMENT

The Australian Division of the Royal Institution of Naval Architects gratefully acknowledges the generous support of the AMDA Foundation Limited for the conduct of the International Maritime Conferences organised by RINA, the Institute of Marine Engineering, Science and Technology and Engineers Australia in conjunction with AMDA's Indo Pacific Maritime Expositions. Without such support the International Maritime Conferences and the publication of *The Australian Naval Architect* would not be possible.

TURBULENCE 1 - CFD AND VPP - GO WITH THE FLOW!

By John Lord

Turbulence 1, Jervis Bay NSW,
(Photo of painting courtesy Debra Quartararo)

The above image is taken from a greeting card that contains a message of thanks to Trevor Ruting, Editor of *The ANA,* and others that I have contacted on the status of computational fluid dynamics (CFD) and velocity prediction programs (VPP), as tools used to aid the design of modern sailing yachts.

The ANA, Nov. 2025, Vol. 29, No. 3, included a letter to the editor and vale for Gerhard Jensen (Professor TUHH and former CEO of SCHOTTEL) noting his pioneering work on computational methods for prediction of ship resistance. Gerhard wrote the panel code v-SHALLO still used at HSVA.

The question has arisen: How far has CFD progressed in forty years?

With this in mind, there has been a discussion with Editorial staff on whether there has been a 'technological gap' in the scope of various sections that all come together to constitute *The ANA*?

Together with the Editor, an on-line meeting was arranged on 12th Feb. 2026 with staff members from HSVA in Hamburg: Dr.-Ing. Yan Xing-Kaeding (Research Project Manager), and Dr. Niklas Kühl (Research – Aerodynamics). It was fortunate that Dr. Kühl had attended the 2024 International Towing Tank Conference (ITTC) at AMC in Hobart. Some questions were addressed about various computer applications that are utilised by HSVA. A record of conversation was returned to HSVA staff.

Also involved, although not directly, were staff and the team of CFD research graduates at the Technical University of Hamburg, Harburg (TUHH). So, also a special note of thanks to Prof. Stefan Kreuger.

In response to some general interest questions about 'how and where has the technology progressed to in forty years', three points of interest emerged:

1. Chalmers University, Sweden, under the leadership of Professor Lars Larsson, including staff and students.
2. Ecole Centrale de Nantes, South of France, and a regional 'technology hub' comprising around 300 companies that are involved in offshore ocean racing. This includes the 'Figaro Offshore Racing Academy' and the 'Figaro Beneteau 3' foil-assisted yacht designed by the Finot-Conq Group.
3. Cluster computing environments that offer the capability to run CFD applications.

This quest for understanding, in a journalistic sense rather than as academic research, initiated a review, via online resources and direct contacts, regarding the applications of CFD and VPP in optimizing the design and handicapping of offshore racing yachts.

At that time, the 2025 Sydney-Hobart Yacht Race delivered surprising handicap results: The first lady skipper to win sailing *Min River*, a JPK 1130 'double-hander'. JPK Yachts finished 1st, 2nd and 8th.

One article of particular interest found on-line was: 'The Geometry of Performance – a chat with Jim Pugh from Reichel/Pugh Yacht Designs'. It was published on the Cruising Yacht Club of Australia (CYCA) website in December 2025. Via an enquiry, the author was Vito Feremans (CYCA Media). Refer to the following link: https://cyca.com.au/the-geometry-of-performance/

Contact was made with Vito Feremans (CYCA) and Paul Glynn (Co-Director of JPK Pacific), regarding a possible collaborative article on following lines: *The Geometry of Performance – Part 2 – a chat with Jean-Paul Kelbert (Owner) & Jacques Valer (naval architect/designer)* JPK Yachts, France. A subtitle might have been: *Handicap Results for JPK Yachts, sailing double-handed in testing conditions – Factors for Success.* This proposed collaboration was complicated and did not proceed.

In the course of conversation with Paul Glynn, it emerged that three JPK 1180 Yachts have been constructed by a Shoalhaven NSW company, Innovation Composites, managed by Mark Rowed. A visit to Innovation Composites revealed a versatile manufacturer of composite industrial products. Mark completed his shipwright apprenticeship at Northshore Yachts, Sydney. The location of Innovation Composites has an interesting history; previously the site for the production of Bashford Boats and Hobie Cat Australia. This is all good news for the local yacht construction and boat building industry.

Schüss JPK 1180 built by Innovation Composites, NSW.

On 11th April 2026, a visit was made to Royal Brighton Yacht Club to see the second locally-built JPK1180, *Schüss*, owned by Denis McConnell. Sailing Co-ordinator, Julian Smith, facilitated access to the marina where *Schüss* was berthed. In the course of the conversation, interest was expressed to contact Neil Patterson, AMC Graduate and someone with recognised expertise in developing a VPP. As luck would have it, Neil is a sailor at RBYC, and Julian Smith volunteered a contact. A subsequent call to Neil Patterson confirmed he had developed a VPP while at AMC, and had provided a copy of his VPP to some folk, for research or not-for-profit use.

Schüss JPK 1180 built by Innovation Composites, NSW
(Photo courtesy RBYC, John Lord)

Australian Sailing Ltd retains ORC Club Certificates for Australian offshore racing yachts, measured and rated according to the ORC rules. For *Schüss* B63, where: beat angle is 135o, wind velocity is 20 kts, the rated boat velocity is 13.59 knots: https://data.orc.org/public/WPub.dll/CC/227204

The third JPK 1180 to be built locally is *Bacchanal*. There is a YouTube video of *Bacchanal* sailing 'off-the-wind' at a high speed, possibly over 20 kts? (velocity unknown but an estimate of ~ 27 knots?) https://www.youtube.com/watch?v=fcw7SwQHLX0

The difference between 'rated' and 'actual' performance for a beat angle 'off-the-wind' is a matter of curiosity?

Via emails, Peter van Oossanen mentioned the Van Oossanen web site and Van Oossanen Academy: https://oossanen.nl/papers-and-publications/

Available via the Van Oossanen Academy web site are copies of relevant books and papers, including: *Predicting the Speed of Sailing Yachts*, by Peter van Oossanen, Proceedings of 1993 Annual Meeting of SNAME, Vol. 101, pp 337-397 (ID No. 3711).

The SNAME Paper by Peter van Oossanen may have provided the methodology for Zwackenberg's HullDrag/32, *Hull Drag Yacht Design Software*: https://www.zwakenberg.de/

Other reference material collected include:

Spanish Company Caponnetto Hueber has a website *Meet the Team*; including Dr Andrew. Baglin, PhD Graduate, UNSW. Refer to the link: https://caponnetto-hueber.com/

Also on the Caponetto Hueber Team: Milovan Peric, a specialist in CFD. Recently retired, Milovan Peric is a co-author of *Computational Fluid Dynamics*, by Ferziger, Peric, Street. Milovan Peric also hosts a YouTube channel that discusses the application of CFD: Refer link: https://www.youtube.com/@MilovanPericCFD

Principles of Yacht Design, Fifth Edition by Lars Larsson, Rolf E. Eliason and Michael Orych. Prof. Larsson is CEO of Swedish Company FLOWTECH.

Adam Persson, published his Doctoral thesis, 2025: *Predicting Yacht Performance in Waves Using a CFD Velocity Prediction Program*. Refer link: https://research.chalmers.se/en/publication/546243

> '*This thesis describes the development of a CFD-VPP procedure for predicting the performance and time-history of motions and forces on a yacht sailing upwind in regular waves. It is the first 6DOF CFD-VPP procedure to handle incoming, quartering waves, and the first CFD-VPP procedure to include a comprehensive unsteady aerodynamics model…..*'

Pierre Robin defended his PhD thesis, 23 Sep 2025: *Racing yachts performance prediction using high-fidelity numerical simulations*. Refer to the following link:

https://www.researchgate.net/profile/Pierre-Robin-2

> *'The objective of this thesis is to improve an existing VPP developed by finot-conq and integrated in FINE/Marine. The VPP code computes sailing-related efforts (sails forces, rudder forces, windage, etc) and inputs them to the hydrodynamic solver ISIS-CFD, developed by ECN. Both the flow and the motions of the boat are solved in the same time by the solver, resulting in a closely coupled VPP…..'*

Danish yacht builder, X-Yachts, has designed and built a new offshore racing yacht, XR-41. This design development was progressed with input of expertise from North Sails. Since its first outing, the XR-41 has performed very well, with good results. In December 2025, there was some 'controversy', resulting in its ORC handicap rating being revised.

Upcoming events planned include the 2026 Sydney-Hobart, America's Cup competition, and Sail GP. These events display the technology now available for design of sailing craft, including foil-assistance.

It is a pleasant surprise that the Tasmanian Section of RINA Aust. Div. is hosting a talk by naval architect Fred Barrett: *The Art & Science of Yacht Rating Rule Optimisation*.

If this topic is of interest to folk with specialist knowledge, please register your interest with the Editor of *The ANA*.

STERN TUBE SACRIFICIAL SLEEVE INSERT

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1. ABSTRACT

The hull and structure of an Armidale Class Patrol Boat (ACPB) are constructed from marine-grade aluminium. This material helps reduce vessel displacement, leading to lower fuel consumption and increased sailing speeds. While aluminium is widely used in ship building, it is susceptible to corrosion failure when exposed to the marine environment, particularly when in contact with dissimilar metals.

Thales Australia, serving as the In-Service Support contractor for the ACPB Class, identified recurring failures of the stern tube due to significant galvanic corrosion within the stern tube adjoining the propeller shaft bearings. This corrosion is primarily caused by the proximity of the dissimilar metals, stainless steel propeller shaft and aluminium stern tube, and the flow of sea water intended for cooling the propeller shaft bearings.

Previous attempts to mitigate this galvanic corrosion included applying Belzona compound at the bearing interface and modifying the shape of the stern tube bearing to smooth water flow discontinuities. These measures failed to effectively prevent extensive corrosion.

In response, the Thales Darwin engineering team developed an innovative solution: freeze fitting a new sacrificial aluminium sleeve insert within the stern tube. This method establishes a strong bond with the stern tube and provides a new material shoulder for the bearing to seat and seal against, reducing the likelihood of bearing failure and corrosion.

Following successful trials of the sacrificial sleeve insert solution, it has now been implemented across the ACPB fleet.

Figure 1 – Forward Sacrificial Sleeve Insert removed after 22 months of installation

Figure 2 – Mid Sacrificial Sleeve Insert removed after 10 months of installation

2. INTRODUCTION

Stern tubes are a critical component in the propulsion system of ships. Their primary purpose is to house the propeller shaft that extends from the engine to the propeller at the stern of the vessel. The key functions of the stern tube include support and alignment for the propeller shaft, ensuring it remains in the correct position as it rotates and transmits power from the engine to the propeller, minimising vibration and power loss. Other functions include, sealing the hull preventing seawater entering the vessel, housing bearings that reduce friction between the rotating shaft and stern tube itself and lastly, circulation of water, which helps to cool and lubricate the bearings, maintaining optimal operating conditions.

ACPB vessels are docked on a 30 monthly schedule. During these maintenance periods both Port and Stbd stern tubes are visually inspected as part the Rolling Hull Survey (RHS) whilst the propeller shafts are removed. The inspection checks include measuring the corrosion diminution within the stern tube along with inspecting the bearings and supporting structure.

The first ACPB's were commissioned into the Royal Australian Navy (RAN) in 2005, as such they have now been in service for 20 years. After 8 years in service, all ACPB's had their stern tubes remediated due to heavy internal corrosion with significant loss of material thickness. The stern tube remediation increased the stern tube wall thickness from the original 16mm to 42mm. This paper presents an improved repair methodology to mitigate the corrosion damaged within the stern tube. This repair involves the installation of an aluminium sacrificial sleeve adjacent to the stern tube Orkot bearings (worst affected areas). These sacrificial sleeves are fitted prior to the installation of the propeller shaft bearings on a 30 monthly basis. This method improves the bearing fit-up and reduces the likelihood of propulsion failure over time. Furthermore, the repair methodology reduces time a vessel is spent out of the water when compared to the previous belzona method, as the filler cure time and

re-machining effort is now removed. Figure 3 presents the bearing housing recess structure prior to the implementation of the aluminium sleeve typically found after the Orkot bearing is removed showing extensive corrosion within the stern tube. Figure 4 presents the existing Belzona bearing recess restoration fit-up prior to bearing instalment.

Figure 3 – Stern tube corrosion around bearing housing recess interface

Figure 4 – Belzona bearing housing recess restoration

3. JUSTIFICATION

Prior to the installation of aluminium sacrificial sleeves as maintenance solution, the Orkot bearings were modified by tapering the inner ends of the bearings as shown in Figure 5. The purpose of the modification was to facilitate laminar flow to reduce material erosion and mitigate corrosion wastage. This bearing design change did not prove to mitigate the corrosion hence the need to find an alternative solution.

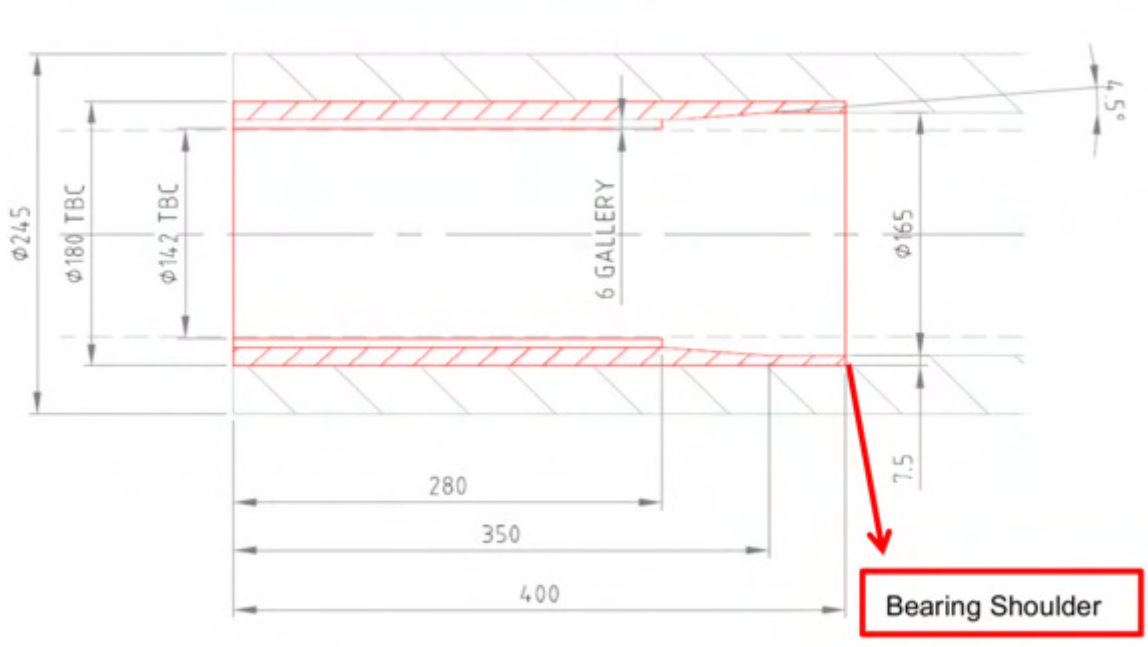


Figure 5 – pre-sacrificial sleeve insert Orkot tapered bearing installation

Internal stern tube loss of material due to corrosion has been noted to be concentrated in the areas near the propeller shaft Orkot bearing and recess housing shoulder. When reinstating a new bearing within the bearing housing recess, the interface between the corroded shoulder and new bearing is addressed by attempting to mechanically clean the existing structure and rebuilding a new shoulder for fit-up. Previous repairs within the stern tubes have been conducted using Belzona 1111 which is a composite compound used for the repair of cracks, holes and resurfacing areas affected by corrosion pitting on casings, pipes and tanks. After Belzona was applied, the repair agent was required to wait 24 hrs for the product to cure and lastly a final machine cut was applied to create a square shoulder to interface with the new Orkot bearing.

After extended periods of time in contact with sea water, Belzona was degrading and detaching from within the stern tube, as shown in Figure 6, Figure 7 and Figure 8. This can block the cooling galleries within the bearing, reducing the flow of cooling seawater down the stern tube. Furthermore, it can expose areas below and around the Orkot bearing to corrosion which causes the bearing to deform and restrict shaft rotation, shown in Figure 7.

Figure 6 – Mid Port bearing inspection with detached Belzona section blocking cooling water flow (6 o'clock)

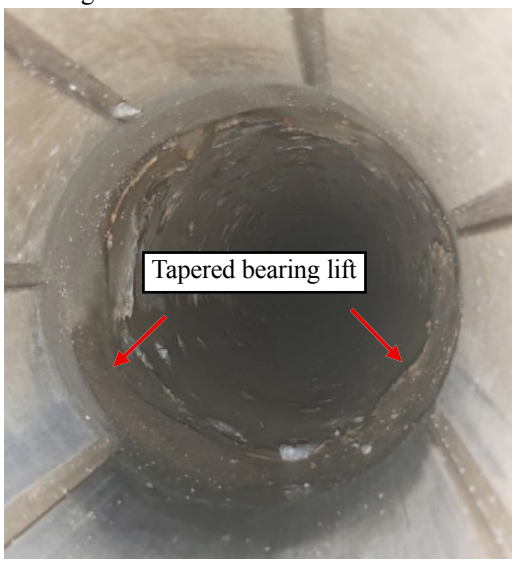


Figure 7 – Mid Stbd bearing deformation due to corrosion developing under the Orkot bearing pressing the bearing edge to collapse inwards

Figure 8 – Stern tube with detached Belzona debris

As a result, an alternative repair method using aluminium sleeves was developed to remove the need for Belzona application within the stern tube. A trial conducted under a Request for Variation (RFV) was approved and installed on 3 ACPB vessels throughout 2023 and 2024.

Multiple inspections of the aluminium sleeve after the initial installation were conducted and all showed low amounts of corrosion compared to the Belzona equivalent repair method. Results and further analysis were provided to the Patrol Boat System Program Office (PBSPO) in a preliminary Engineering Assessment Report, Reference [E], and also detailed in Section 7, RFV Validation and Results. Based on these results, the use of the aluminium sleeves was recommended as the preferred repair method over the use of Belzona.

4. DESIGN

The propeller shaft of an ACPB is mounted with 3 bearings: Aft, Mid and Forward (Fwd) as shown in Figure 9. The Mid and Fwd bearings are installed on each end of the stern tube while the Aft bearing is fitted on a A-Bracket appendage outside the hull. The worst corrosion affected areas are in the stern tube located closer to the Mid and Fwd bearings.

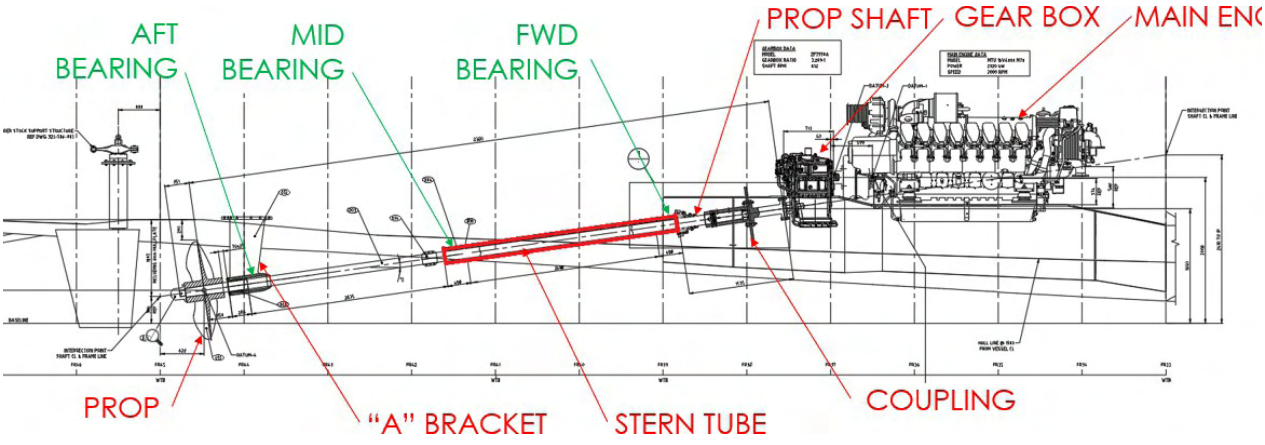


Figure 9 - Stern tube arrangement

Figure 10 shows a cross-section view through a stern tube. The sleeves are installed within the stern tube at the Fwd (Figure 11) and Mid (Figure 12) bearing housing recesses to provide a square and uniform shoulder for the Orkot bearing to be seated and sealed against. This prevents seawater corrosion developing beneath the Orkot bearing reducing the risk of the bearing collapsing inwards and binding with the shaft rending the propulsion system inoperable.
During design, the aluminium sleeve inserts were reviewed and accepted by the Classification Society Det Norske Veritas (DNV) and the PBSPO Principal Engineer.

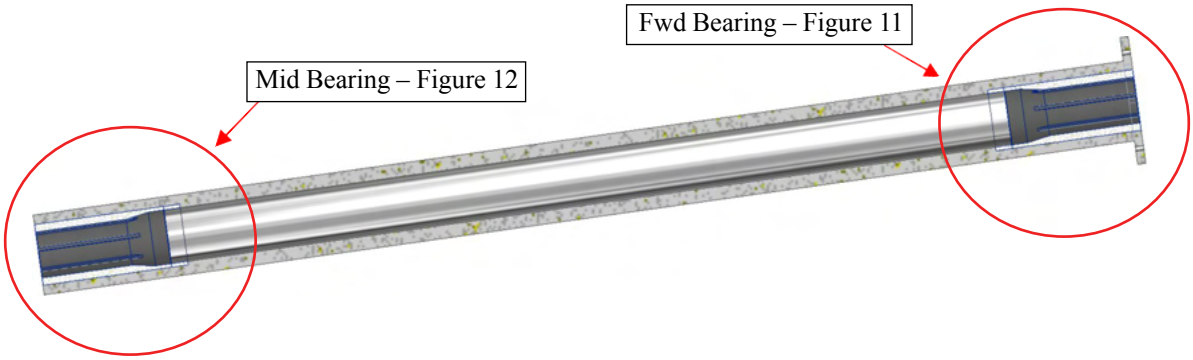


Figure 10 – Stern tube configuration

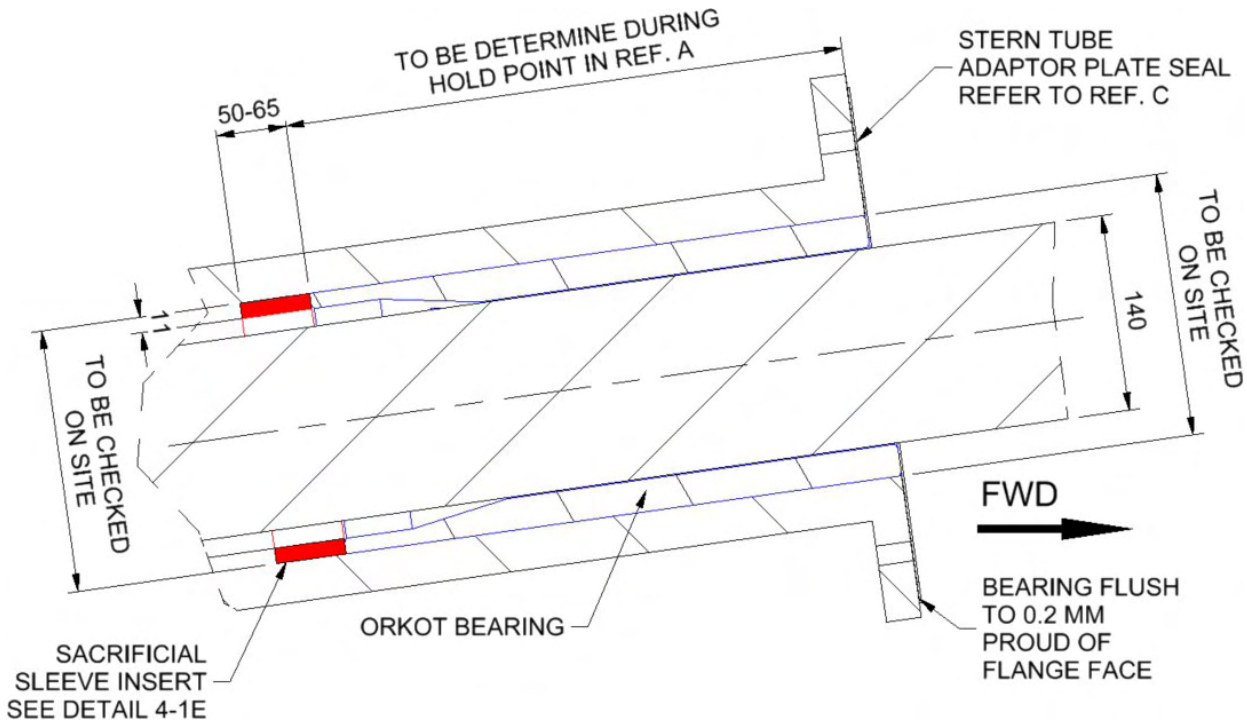


Figure 11 – Fwd bearing configuration with aluminium sleeve insert shown red

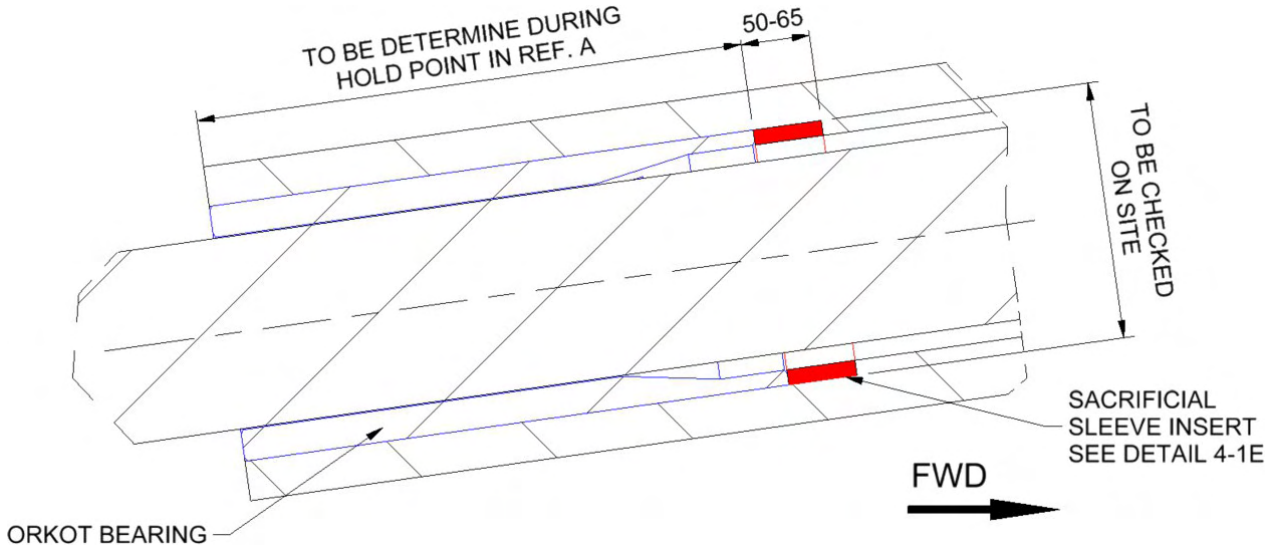


Figure 12 – Mid bearing configuration with aluminium sleeve insert shown red

The sleeves have been designed to not alter the internal geometry within the stern tube. The sleeves are machined to the same internal diameter (ID) as the existing stern tube and the tapered end of the bearings, so as to not impact cooling and water flow down the stern tube as shown in the sleeve's technical drawing, Reference [A]. Furthermore, the sleeves are designed to be sacrificial and easily removable when they become unable to provide a shoulder for the Orkot bearing to seat and seal against. To reduce the rate of corrosion the sleeves are made from 5083 grade aluminium, matching the material properties of the parent stern tube material, Reference [B]. No coatings or paints are required within the stern tube or on associated components.

The aluminium sleeve inserts are machined to fit within Fwd and Mid, Port and Stbd bearing housing recesses. After each housing recess has been bored and machined to provide a clean, uniform surface with no defects, voids or marks, the repair agent measures the journal in three planes and three orientations in accordance with specifications in the Work Instruction, Reference [H]. The wall thickness of each sleeve will depend on the amount of machining performed by the repair agent to prepare the bearing.

The Orkot bearings are to be machined in accordance with the measured dimensions after the bearing journal has been machined. The active length of the bearing is to be twice the diameter of the bearing in accordance with the Original Equipment Manufacturer (OEM) requirement (Reference [I]). The final length of the Fwd bearing shall be such that the bearing face on the Fwd end is level or protruding by 0.2 mm on the stern tube flange shown in Figure 11. The bearing face can be finished post installation in situ to achieve this requirement. Final dimensions of the Orkot bearing are generated by the Orkot Bearing Calculator (Reference [C]) which provides machining details and tolerances for the ID and OD with a specified length.

5. MOUNTING

The aluminium sleeves are installed by the freeze-fitting method using liquid nitrogen (LN2), similar to the method used for the installation of the Orkot bearings into the stern tube, Reference [I]. The machined aluminium sleeve and bearings are submerged in LN2 which causes the overall dimensions to shrink as it cools to -196°C (T_1). For the sleeves, the change in diameter (ΔD) can be calculated with the below equation by using the linear expansion coefficient (α) of Aluminium given as $\alpha = 2.38x10^{-5}\ m/C$ (Reference [J]). As the sleeve returns to ambient temperature (T_0) it expands and is secured by having a 0.15 mm interference fit (D_1) based on the OEM recommendation for the Orkot bearing. For Darwin, the average ambient temperature is assumed to be approximately 30°C.

$$\Delta D = D_0 \alpha\,(T_1 - T_0)$$

$$D_1 = D_0 + D_0 \times \alpha \times (T_1 - T_0)$$

An example of the final machining dimensions for the aluminium sleeve is calculated below. Based on a measured bearing housing recess internal diameter of 189.21 mm, once frozen the clearance between the sleeve and the journal is approximately 0.87mm after the external diameter of the sleeve has decreased by 1.02 mm. This allows sufficient clearance within the recess to fit the sleeve before it expands and is locked in position. The Orkot calculator (Reference [C]) factors in thermal shrinkage in the design and no further input from the installer is required.

HMAS CHILDERS - ALUMINIUM SLEEVE INSERT DIMENSIONS

DATE	03/03/2025	
JOB	MP01-25 (INT)	
LOCATION	PORT - FWD	

α	2.38E-05	m/C	Thermal coefficient
T_o	30	°C	Ambient temp
T_1	-196	°C	Liquid nitrogen
	189.21	mm	Outer Diameter (min housing)
	0.15	mm	Interference
D_0	189.36	mm	final diameter
D_1	188.34	mm	*Freeze shrink diameter
	1.02	mm	Shrinkage amount
	0.87	mm	Clearance (Diameter)

*Thermal Expansion calculated by $D_1 = D_0 + D_0 \times \alpha \times (T_1 - T_0)$

Final Machining Dimensions - Port FWD

OD	189.36	mm
ID	167.36	mm
Length	65.00	mm

Figure 13 – New Aluminium Sleeve Installation - (Typical Port and Stbd)

6. BEARING AND SACRIFICIAL SLEEVE REMOVAL

For removal and installation of the bearing and sacrificial sleeve insert, a router tool has been manufactured to fit within the stern tube and slot cut sections longitudinally from within. After machining is complete, the bearing and sacrificial sleeve insert internally collapses within to prevent damage of the stern tube housing recess.

7. RFV VALIDATION RESULTS

Validation of the effectiveness of the aluminium sacrificial sleeve insert in reducing corrosion was evaluated by assessing the inserts condition over several periodic inspections requested by PBSPO. The inspections included:

1. HMAS Albany
   Maintenance Period (MP)
   i. MP01-23 – Initial Inspection (6 months post install) – refer to Table 7-1: HMAS ALBANY Insert Sleeve Measurements
   ii. MP03-23 – Second Inspection (10 months post install) – refer to Table 7-1: HMAS ALBANY Insert Sleeve Measurements
2. HMAS Broome
   1. MP03-23 – Initial Inspection (8 months post install) – refer to Table 7-2

During HMAS Albany's MP01-23 and MP03-23, the Port and Stbd shafts were removed to inspect the new forward bearing sacrificial sleeves as part of the RFV, Reference [K] . After the shafts were removed and prior to the stern tubes high pressure clean, Thales observed the sacrificial sleeves oxide layer which protects the aluminium from breakdown was immediately attacked and the corrosion appears aggressive in the turbulent flow zone directly behind the tapered end of the bearing. After cleaning the stern tubes, it was later observed that the sacrificial sleeves were starting to degrade with corrosion mainly occurring at the shoulder where the sacrificial sleeve interfaces with the bearing. The depth of the corrosion inspected was recorded between 0.5 to 6 mm across the 11mm thickness of the sleeve when measured at four locations 3, 6, 9 & 12 O'clock as recorded in Table 8-1. The deepest wear section appears to be at 6 O'clock on the lower radius of the sleeve followed by the sides at 3 and 9 O'clock. Refer to Figure 14 through to Figure 25 for inspection photos.

Table 7-1: HMAS ALBANY Insert Sleeve Measurements

Ships side/ location	Clock Position	Original Thickness (mm)	MP01-23 Reduction (mm) post 6 months service	MP03-23 Reduction (mm) post 10 months service	Total Reduction (%)
FWD - PORT	12	11	0.5	0.5	5%
FWD - PORT	3	11	2	6	55%
FWD - PORT	6	11	3	3	27%
FWD - PORT	9	11	2	4	36%
FWD - STBD	12	11	1	1	9%
FWD - STBD	3	11	2	3	27%
FWD - STBD	6	11	4	4	36%
FWD - STBD	9	11	3	3	27%

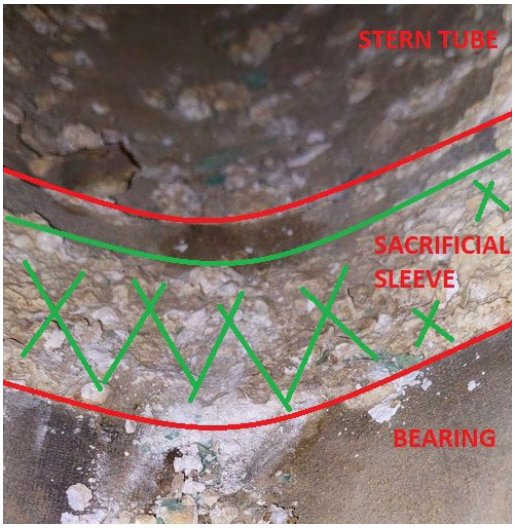


Figure 14 – Port Fwd Sleeve 6M Corrosion (Uncleaned and showing oxide build up marked in green)

Figure 15 – Port Fwd Sleeve 6M Corrosion (High Pressure Washed)

Figure 16 – Port Fwd Flange Location ID's

Figure 17 – Port Fwd Location 1 (12 O'clock) Corrosion 6M

Figure 18 – Port Fwd Location 2 (3 O'clock) Corrosion 6M

Figure 19 – Port Fwd Location 3 (6 O'clock) Corrosion 6M

Figure 20 – Port Fwd Location 4 (9 O'clock) Corrosion 6M

Figure 21 – Stbd Fwd Location 1 (12 O'clock) Corrosion 6M

Figure 22 – Stbd Fwd Location 2 (3 O'clock) Corrosion 6M

Figure 23 – Stbd Fwd Location 3 (6 O'clock) Corrosion 6M

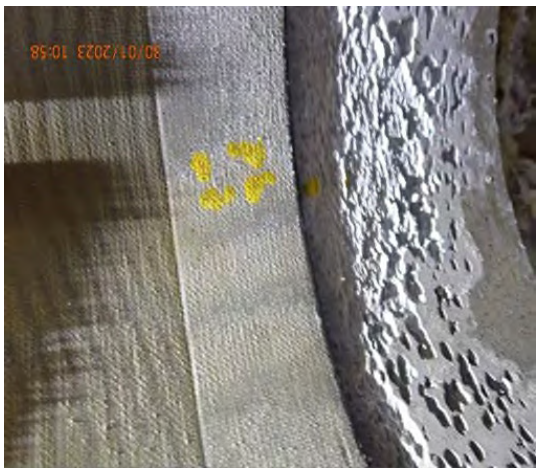


Figure 24 – Stbd Fwd Location 4 (9 O'clock) Corrosion 6M

Figure 25 – Stbd Fwd Location 3 (6 O'clock) Corrosion 6M

Similarly, during HMAS Broome's MP03-23, the Port and Stbd shafts were removed to inspect the new forward bearing sacrificial sleeves as part of the RFV. Results shown in Table 7-2 appear with similar corrosion readings observed at 3, 6, 9 and 12 O'clock locations.

Table 7-2: HMAS Broome Insert Sleeve Measurements

Ships side/location	Clock Position	Original Thickness (mm)	MP03-23 Reduction (mm)	Total Reduction (%)
FWD - PORT	12	11	2	18%
FWD - PORT	3	11	5	45%
FWD - PORT	6	11	2	18%
FWD - PORT	9	11	4	36%
FWD - STBD	12	11	+1[2]	-
FWD - STBD	3	11	1	9%
FWD - STBD	6	11	3	27%
FWD - STBD	9	11	3	27%
MID - PORT	12	11	<1mm[1]	-
MID - PORT	3	11	<1mm[1]	-
MID - PORT	6	11	<1mm[1]	-
MID - PORT	9	11	<1mm[1]	-
MID - STBD	12	11	N/A	-
MID - STBD	3	11	N/A	-
MID - STBD	6	11	N/A	-
MID - STBD	9	11	N/A	-

[1] surface corrosion visible however not measurable

[2] 12 oclock position is slightly proud of the bearing due to potential concentricity errors when machining and installing the bearing/ insert

7.1 Fwd Bearing Sacrificial Sleeve Replacement

During HMAS Albany's mid-year maintenance period, 22 months beyond the sacrificial sleeve installation, both Port and Stbd forward sleeve inserts were found to have excessive waste and were replaced. Upon inspection, the face of the sleeve that interfaces with the bearing was found to be corroded throughout the full thickness as shown in Figure 26, however on the opposite side of the sacrificial sleeve, the material thickness remained intact as shown in Figure 27. No corrosion was identified beneath the sleeve inserts after removal.

Figure 26 – Sacrificial sleeve mating face with bearing recess 22M corrosion

Figure 27 – Sacrificial sleeve mating face with bearing recess 22M Corrosion

Figure 29 – Sacrificial sleeve external condition 22M

8. EXECUTIVE SUMMARY

Due to ongoing issues with Belzona breakdown within the stern tube, an alternative repair method was developed to reinstate the square shoulder for the Port and Stbd, Fwd and Mid bearing interfaces. This change removes the need to use Belzona 1111, which is replaced by aluminium sacrificial sleeve inserts installed within the stern tube.

Initially trialled under RFV on HMAS Albany, the early results showed that, after extended periods, the sacrificial sleeve insert would slowly corrode in a controlled and predictable manner. This prevents any blockages within the bearing cooling galleries or damage to the shaft. The RFV trial was further extended to include HMAS Broome and was later approved as an Engineering Change on HMAS Childers, based on the initial inspection and service data.

The sleeve inserts are machined to have an interference fit. The sacrificial aluminium sleeves are then super-cooled using liquid nitrogen (LN2), causing the sleeves to shrink in size to allow easy insertion into the stern tube. As the sleeve returns to ambient temperature, it expands inside the stern tube and is secured in place via the interference fit.

The new sacrificial sleeves reduce the likelihood of bearing failure by preventing corrosion under the bearing, which can deform the cylindrical shape and increase contact with the propeller shaft. The sacrificial sleeves also eliminate additional stern tube diminution, as new material can be replaced over time. The new process of installing the sacrificial sleeves reduces production time, saving up to four days compared to the Belzona method, due to shorter curing times and reduced machining requirements.

Based on initial inspections conducted by Thales and the results provided, no additional requirements for sleeve or bearing replacement are needed within the regular 30-month docking schedule. Finally, this repair method has also been implemented on the Cape Class Patrol Boat Platform experiencing similar stern tube issues.

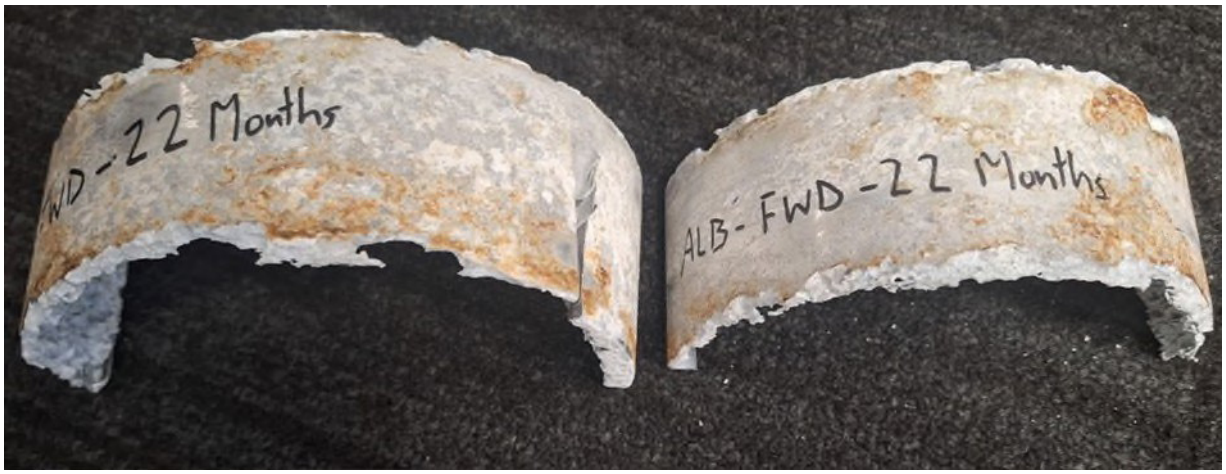


Figure 28 – Bearing recess after sacrificial sleeve removal 22M

9. AUTHOR / PRESENTER BIOGRAPHY

Bradley Abdilla is the Engineering and Data Manager at Thales Australia, where he oversees the Armidale Class Patrol Boat Platform. With over thirty years of experience working on Royal Australian Navy platforms, Bradley specializes in the development and implementation of engineering support systems and processes. He ensures that all engineering and maintenance work including that performed by subcontractors meets engineering governance, project constraints, schedule, cost and quality.

As a Chartered Engineer with a distinguished career in the maritime and fabrication industries, Bradley is recognized for his meticulous attention to detail, analytical skills, and technical leadership in Naval Architecture and maritime solutions. He has managed teams delivering Engineering Change Proposals and has guided senior management, planning, and production teams through major and minor engineering design solutions, addressing technical issues, safety concerns, obsolescence, and integration upgrades all in line with the Royal Australian Navy's change processes.

10. REFERENCES

A list of references is provided in Table 10-1.

Table 10-1: References

Ref & Document No	Title
[A] APB-507-008	STERN TUBE SACRIFICIAL SLEEVE INSERT
[B] APB-507-003	STERN TUBE ARRANGEMENT
[C] 0108TL1140	TRELLBORG - ORKOT MARINE BEARING CALCULATION, METRIC VERSION
[D] APB-507-001	MAIN ENGINE SHAFTING ARRANGEMENT
[E] APB-EAR101-0139	EAR - 9999_00678 - STERN TUBE SACRIFICIAL SLEEVE INSERT INSPECTION REPORT
[F] A0100018	30M - NAVAL HULL INSPECTION - HULL STRUCTURE
[G] A0101283	60M - NAVAL HULL INSPECTION - HULL STRUCTURE
[H] APB-WI101-0331	WI - 9999_00678 - ACPB ALUMINIUM SLEEVE INSERT INSPECTION
[I] 99GBV3BROEE0220	TRELLBORG - ORKOT MARINE BEARINGS - ENGINEERING MANUAL
[J]	The Engineering ToolBox (2008). *Linear Thermal Expansion*. [online] Available at: https://www.engineeringtoolbox.com/linear-thermal-expansion-d_1379.html
[K] APB-RFV101-0189	RFV - 9999_00678 – STERN TUBE SACRIFICIAL SLEEVE INSERT

Spirit of Australia 2

We previously reported Blowering Dam was at about 24% of capacity hindering trials with *Spirit of Australia 2*. The dam level has since increased to about 55% of capacity. Monitoring the dam level, the Warby team hope to return for further trials in about November, on the basis that the water level should have increased further after the snow season.

David Warby reports that during their time in the UK at the Bluebird Festival at Coniston, they managed to make some great contacts with interest in assisting with wind tunnel testing and CFD analysis of the craft. Practical feedback was also obtained in relation to their most recent trials in August and November 2025.

From footage of the behaviour of the boat taken from a compact video camera mounted on top of the tailplane during the August 2025 trials (see "Spirit of Australia 2 - The Fastest Team on Water" Facebook page), it is apparent how rapidly the hydroplane moves between glassy smooth water and slightly rippled water demonstrating how conditions vary along the length of the course, even when conditions are relatively calm. Also apparent from the video is the oscillation of the spray generated off the forward pair of hydroplanes, indicating a degree of porpoising at some points along the course but absent at other times. This highlights the challenge in understanding the dynamic behaviour of the boat as higher speeds are attempted.

Spirit of Australia 2 tailplane video camera footage screenshots from August 2025 trials on Blowering Dam showing oscillation of spray sheets from the forward hydroplanes (Courtesy Warby Motorsport team Facebook page video)

Compiled from Spirit of Australia 2 Facebook page.

ThrustWSH World Water Speed Record Project

In the February issue, we reported on the ThrustWSH (https://thrustwsh.com/) bid for the outright World Water Speed Record led by Richard Noble.

The venture remains at an early stage with the team effort focussed on the development and testing of remotely and autonomously operated smaller scale models to assess the feasibility of their hydrofoil supported hydroplane proposal.

The latest video released by the team in February 2026 reviews the featured of their current quarter scale 3.0m long model designated C3.2B. Fitted with a 352 lb thrust AMT Jets Lynx jet engine, this model is also equipped with a set of four controllable incidence foils. The intention is that this model would be capable of achieving a speed in excess of 200 mph.

Since testing of the model last November, it has been stripped down for a complete overhaul of internal systems. The trials demonstrated that the onboard electronic systems could only be effectively protected from moisture if they are all contained within their own watertight enclosures. While this challenges the weight and CG budget for the model and consumes greater internal volume, the change has been made. The control system for the model allows for both radio controlled and autonomous operation with GPS based geo-fencing implemented to keep the model within a safe operating area. Additionally, thrust cut-off is possible from a number of different observation points along the operating course, which will be substantial even at model scale.

The data acquisition system is intended to gather data on the aerodynamic pressure distribution over the model using 56 different pressure taps around the model. Load cells are fitted to measure drag on the four foil units and strain gauges measure loads on the steering mechanism. Small video cameras mounted within the model and above the aft foils are intended to monitor cavitation behaviour on the four foils. At least five accelerometers are also placed around the model to derive motions while a magnetometer is used to indicate the model heading. The ultrasonic height sensors previously fitted to the model, which proved unreliable when subject to the emissions generated by the jet engine, have been replaced with radar-based height sensors.

While the video suggested the next trials were scheduled for late January this year, there is no indication on the team website of progress with such trials since the model refit.

The quarter scale C3.2B composite model with a glimpse of the on-board control and monitoring systems. The jet engine had been removed (Screenshot courtesy of ThrustWSH team video)

Compiled from thrustwsh.com February 2026 video update.

INDUSTRY AND GENERAL NEWS

NAVAL SHIPBUILDING/ SUSTAINMENT

OPV HMAS *Eyre* commissions into RAN in WA

The Royal Australian Navy commissioned HMAS *Eyre* into the fleet today, in a ceremony at HMAS Stirling in Western Australia. HMAS *Eyre* is the second of six planned Arafura class offshore patrol vessels (OPV) to enter service, following the commissioning of sister ship HMAS *Arafura* last year.

The 80-metre long Arafura class OPVs will help patrol and secure Australia's maritime border alongside the Evolved Cape class patrol boats. Together, they play a key role in humanitarian and disaster relief, and enhance Navy's regional engagement.

HMAS *Eyre* commissioning
(Photo courtesy Defence Media)

HMAS *Eyre* has a range of 4,000 nautical miles and can perform roles previously requiring numerous vessels. The ship has further improved living quarters and amenities to better support sailors and officers deployed at sea. HMAS *Eyre* was built by Civmec Defence Industries (formerly Luerssen Australia) at the Osborne Naval Shipyard in South Australia.

The next four OPVs are under construction at the Civmec Defence Industries Henderson Shipyard in Western Australia.

The Chief of Navy, Vice Admiral Mark Hammond, AO, RAN said:

> The commissioning of HMAS *Eyre* strengthens our nation's maritime security, providing our Navy with the capability to protect Australia's maritime approaches, contributing to stability in our region. Offshore patrol vessels like HMAS *Eyre* are a force multiplier, performing a number of roles in a variety of missions. HMAS *Eyre* will conduct maritime surveillance interdiction and was purpose built to embark containerised mission systems as part of an integrated capability. I am very much looking forward to seeing all six of these flexible ships in the hands of our capable Royal Australian Navy sailors.

Department of Defence media release *30 May 2026*

Austal contracts with DNV and LR for Classification Services

Austal Defence Shipbuilding Australia Pty Ltd has signed agreements with Lloyd's Register and DNV Australia, to provide Naval Classification Services across the lifecycle of the Landing Craft Medium and Landing Craft Heavy build programs, set to be delivered to the Australian Army under the Strategic Shipbuilding Agreement.

The Lloyd's Register agreement provides contractual services for the Landing Craft Medium build program until 2032 and Lloyd's Register staff will be present for the duration of the contract lifecycle at Austal's Henderson facilities.

The DNV Australia agreement will extend services over the life of the Landing Craft Heavy build program, scheduled for completion in 2038.

Austal & DNV contract for LCH services
(Photo courtesy Austal)

The Landing Craft Medium and Landing Craft Heavy vessels will be assessed to the International Quality Management Standard ISO 9001 by the two classification services providers.

The agreements extend Austal's long running partnerships with both Lloyd's Register and DNV Australia for quality assurance work, and was a highlight of Day 2 of the Indian Ocean Defence & Security (IODS) Conference and Exhibition 2026.

Austal media release *28 May 2026*

Austal launches first of enhanced Cape class patrol boats for Border Force

Austal has launched the first Evolved Cape class Patrol Boat (ECCPB) for the Australian Border Force (ABF) in June 2026. The event marks a key milestone in the ongoing relationship between Austal, the ABF and the Commonwealth of Australia.

This is the first of six ECCPBs Austal is contracted to deliver to the ABF, with two vessels added to the existing order of

four in early May 2026. All six will be built at Henderson, supported by Austal's national and local supply chain and other partnerships.

The launch follows the recent delivery of the last of 10 ECCPBs for the Royal Australian Navy, with Australian Defence Vessel *Cape Hawke* handed over in March 2026.

Austal CEO Paddy Gregg said it confirmed both the effectiveness and key role of the ECCPB in supporting ABF to protect Australia's borders. He said:

> Constructed by our experienced workforce, with the benefit of our demonstrated partnerships, and incorporating Austal's commitment to innovation, orders like these for the ABF recognise this platform as a core component of national maritime security.

The 58.1 metre ECCPBs are designed to support a wide range of missions, including border protection. and feature enhanced quality-of-life systems and sustainment technologies.

Austal delivered eight original Cape class Patrol Boats (CCPB) to the ABF between 2012 and 2015, also constructing CCPBs for the Royal Australian Navy and the Trinidad and Tobago Coast Guard. The new ABF vessel is expected to be completed in the final quarter of 2026.

Austal media release *9 June 2026*

Speartooth – Battery-powered long-range UUV achieves European debut in Germany

C2 Robotics, and its European partner Eurobotics GmbH, has marked a significant milestone with the Speartooth Large Uncrewed Undersea Vehicle (LUUV) being sold to Germany. Supporting this announcement for the Australian owned company was The Hon Pat Conroy MP, the Minister for Defence Industry, at C2 Robotics' Melbourne HQ today.

Speartooth large UUV for Europe
(Photo courtesy C2 Robotics)

Building on the recent US sales announcement, these further international sales highlight a growing interest amongst military buyers of Speartooth's Large Undersea Vehicle..

The Speartooth LUUV has been designed to deliver scalable, cost-effective undersea capability across intelligence, surveillance, reconnaissance and strike missions. Its smaller size and lower unit cost enable it to operate in contested environments and generate force multipliers in ways that traditional platforms cannot.

Three critical contexts have converged to make the Uncrewed Undersea Vehicle market explode in popularity. Military experts have increasingly highlighted that undersea operations remain the last domain of stealth, acknowledging the rapid expansion of space, air and land based ISR assets over the battlefield.

Recent conflicts have also recognised that autonomous systems are not just contributing to the effort – they are becoming the main effort, with more expensive crewed systems transitioning into lower risk or niche roles.

Finally, western submarine construction is faltering. Excruciatingly long contractual, development and construction timelines are causing cost blowouts and reduced numbers. Increasing sustainment costs and maintenance overheads are also reducing availability – creating capability gaps.

Today's announcement also formally represents C2 Robotics' exclusive partnership with Eurobotics GmbH as both an agent and manufacturing partner in Germany to support wider NATO and European sales. With more allies considering Speartooth, the ability to share payloads and payload development not only reduces capability timelines, but it also increases mission roles and cost efficiencies.

C2 Robotics is a leader in robotics, autonomous systems and artificial intelligence based in Melbourne, Australia. Innovation, rapid concept development and iterative prototype fielding is at their core, with a key focus on developing innovative systems across the maritime, land and air domains. Their team is comprised of a group of experienced industry veterans and a leadership team that includes the founders of previous highly successful defence and aerospace companies in the fields of AI and robotics.

[The UUV has a hull diameter of one metre (3.3 feet), a minimum displacement of 2,000 kg, and a lithium-ion battery pack that can deliver silent navigation to reduce the risk of detection. The manufacturer said the craft will be available in variants between eight and 12 metres (26 and 39 feet) long. - Ed]

C2 Robotics media release *20 May 2026*

Indian Ocean Defence and Security Conference (IODS). Perth, 26-28 May 2026

IODS 2026 has concluded following a landmark week in Perth, reinforcing Western Australia's position as a national hub for defence industry, sovereign capability and workforce development. The event recorded 9,795 attendances across three days, including Careers Day student and teacher groups, and marked the largest IODS to date, with exhibition space and attendance doubling since 2024. IODS 2026 was delivered by Defence West and the Western Australian Government with organiser AMDA Foundation.

The IODS conference is aimed at providing a forum to discuss Defence and Security for the Indian Ocean. The event complements the biannual Indopac conference in the alternate years. Although smaller in size the conference and exhibition attracts key parliamentarians, industry and regional military visitors for discussions on regional issues such as defence capability, local industry and supply chains as well as strategic regional engagement. As a visitor it is noticeable that there is a strong influence from Western Australia demonstrating its roles as a key hub for Australian Defence and it particular its role in the maritime domain.

The exhibition floor had over 250 exhibitors that included all of the maritime primes, supply chain companies, service providers and the academic sector across maritime, cyber, space, autonomous systems, advanced manufacturing and defence technology. In contrast to Indopac it was noticeable that each of the Western Australian universities had their

Collage from IODS 26 in Perth
(Photo courtesy AMDA)

own stands to showcase their capabilities and to attract local students to their programs. None of the three professional engineering institutions that support Indopac participated in the exhibition. The main conference was supported with small side conferences to pass on recent developments in local issues. Of particular interest was learning about the latest developments made by Austal and its partners in supporting the Strategic Shipbuilding Alliance as well as panel sessions on autonomous system development.

Autonomous systems panel discussion
(Photo courtesy Rob Palmer, AMCSearch)

The week concluded with Careers Day, connecting students with pathways across defence industry and Australia Defence Force careers. A highlight was Australian astronaut and 2026 Australian of the Year, Katherine Bennell-Pegg, who met with students and encouraged pursuit of STEM and defence careers.

The Indian Ocean Defence & Security (IODS) 2026 Innovation Pitchfest and Awards spotlighted the ingenuity shaping Australia's maritime and defence future. This year's finalists represented a diverse cross-section of industry, from advanced robotics and secure communications to next-generation training and sustainment solutions, each demonstrating practical capability aligned to evolving operational requirements. Congratulations to the winners:

- Innovation Award: Greenroom Robotics - Lookout+
- Young Innovator Award: Alice Haddon, Chief Fluid Systems - Emergency Hose Replacement Kit
- Emerging Technology Award: Space CoLAB - Post Quantum Security – Communications
- Blue Sky Thinking Award: Dylan Muir LexChip Pty Ltd - LexChip

Western Australian Minister for Defence Industries, the Hon. Paul Papalia CSC MLA, confirmed IODS will return in 2028, to be held in Perth from 30 May – 1 June.

IODS 2026 E-news #34, 29 May 2026 and Stuart Cannon email 15 July 2026

Austal and BMT sign strategic agreement to strengthen ship design and engineering capacity

Austal and BMT have signed a strategic agreement to provide scalable ship design and engineering capability, supporting the delivery of shipbuilding programs. The agreement establishes an enterprise-level framework that enables Austal to access specialist resources as project demands fluctuate and creates a dedicated platform for closer collaboration on commercial ship projects - an area of shared strategic priority for both companies.

Under the agreement, effective June 2026, BMT will provide naval architecture and engineering services to support the delivery of ship design and technical integration activities. This scalable model enables Austal to respond efficiently to peak project requirements, reducing schedule risk while maintaining focus on core shipbuilding operations. The collaboration also opens a structured pathway for joint pursuit of commercial vessel projects, bringing together independent ship design expertise, including an extensive portfolio of specialist ship designs and proven shipbuilding capability to support faster, more competitive delivery for customers.

Both companies intend to leverage this agreement to jointly pursue new market opportunities, reinforcing a long-standing working relationship between Australia's strategic shipbuilder and its largest independent ship design capability, while also

focusing on commercial and export shipbuilding sectors and supporting sustainable growth for both businesses.

Oliver Morton, Executive Vice President Sales and Strategy at Austal Limited commented that Austal is pleased to formalise this strategic agreement with BMT, building on a long-standing relationship founded on complementary capability and shared ambition. As their shipbuilding programs continue to grow, access to scalable, specialist design and engineering support will help them respond with agility while maintaining focus on safe, efficient and high-quality shipbuilding delivery.

Agreement signing at IODS From L–R: Trevor Dove, Future Business Director, Asia-Pacific, BMT; James Stokes, President – Australasia, Austal; Graeme Nayler, Regional Business Director, Asia-Pacific, BMT; Oliver Morton, Executive Vice President Sales and Strategy, Austal. (Image courtesy Austal)

This agreement reflects the natural evolution of a relationship that has deepened steadily based on shared ambitions and complementary capabilities. BMT's collaborative footprint in the Australian and Asia-Pacific maritime domain spans a broad portfolio - from its role alongside BAE Systems on the Anzac Class Designer Support Contract (DSC-West) and its acquisition of Australian Maritime Technologies, to its SEA1442 Phase 5 communications program for the Royal Australian Navy, and its partnership with KBR on maritime sustainment outcomes.

Across commercial and defence domains, BMT has consistently shown that independent design expertise, combined with deep, complementary industry partnerships, delivers the strongest outcomes for customers in the maritime domain.

The Austal–BMT strategic agreement signing took place at the Indian Ocean Defence and Security Conference and Exhibition (IODS), held in Perth, Western Australia, 26-28 May 2026.

Austal media release *19 June 2026*

Hyperion Systems 3-D Printed USV

Western Australia-based Hyperion Systems has unveiled what it said is the southern hemisphere's first 3D printed uncrewed surface vessel (USV). Designed by local naval architecture firm Versatile Marine and powered by Greenroom Robotics' AI and autonomy software, the USV will be manufactured at Hyperion's Henderson facilities. The 4.6-metre hulls will be 3D printed using large format additive manufacturing (LFAM) and recycled polymer waste by a consortium led by Hyperion Systems with integration support from Australian stakeholders. Hyperion CEO Joshua Wigley said each vessel hull will be manufactured in approximately 40 hours using LFAM 3D printing, compared to at least four to six weeks using traditional boatbuilding methods.

Hyperion Systems CEO and founder Joshua Wigley (left) and Greenroom Robotics COO and co-founder Harry Hubbert with a USV (Photo courtesy Hyperion Systems)

The autonomous navigation and control system will be delivered by Greenroom Robotics' GAMA platform. Hyperion said this will provide a proven solution that is flexible and readily scalable to varying USV configurations. Greenroom Robotics co-founder and COO Harry Hubbert added that Greenroom's autonomy stack is ideally suited to Hyperion's rapidly reconfigurable 3D-printed USV platforms. In contested environments, the ability to quickly adapt a vessel to meet evolving mission requirements delivers a significant asymmetric advantage. Hyperion's 3D-printed USVs can deliver almost real-time customisation to suit the specific operating context.

Hubbert added that because manufacture, autonomy integration and deployment on the water can be completed in a matter of days, it "opens up endless possibilities for rapid, scalable and distributed maritime defence."

Hyperion said that the craft will be among the world's first LFAM 3D-printed USVs and that a larger eight-metre initial prototype is planned to be supplied to a European navy for use at a major naval exercise later in 2026.

Subject to successfully completing a series of rigorous sea trials which will start later this month, the fully autonomous vessel will feature: a top speed approximately 40 knots; a cruising speed of between 20 and 30 knots; a range of up to 200 kilometres; multi-mission capability, including covert movement of small teams; operation across a range of sea states; and modular payload flexibility for surveillance, security and defence roles.

Wigley said combining Hyperion's AI development toolkit with variable scale LFAM printing capacity will mean the USV will be the first of a series that will be produced in many sizes and capability configurations. These can be printed either in Henderson or deployed and printed using Hyperion's modular cells that would permit on-site manufacture in remote areas.

Will Xavier, Baird Maritime *26 May 2026*

Special operations boats from Sentinel

Tasmanian boat builder Sentinel Boats has won a Defence contract to deliver up to seven general purpose watercraft for Australia's elite Special Operations Forces. The contract is for the latest evolution of Sentinel Boats' 830R vessel, namely a single point lift (SPL) variation of this high-performance rigid hulled inflatable boat (RHIB) designed for Defence, law enforcement and rescue operations.

CEO George McGuire said the contract was not only a great vote of confidence in Sentinel Boats, but also in Australian design and manufacturing capabilities.

Like all Sentinel vessels, the 830R-SPL is made from high-density polyethylene (HDPE), a unique boat building material that offers superior performance, crew safety, is incredibly durable and can absorb impacts that would render other vessels inoperable. It can also be quickly repaired in the field, removing operational downtime. Sentinel Boats will initially provide two 830R-SPL watercraft to Special Operations Command later this year. The 830R was first developed as a high-performance police vessel. The next rear console variant was focussed on military/para-military operations, including boarding operations. These vessels were exported to Ukrainian Armed Forces through Australia's military gifting program, as well as being used by Defence. Now the latest variant, the 830R-SPL, will enter service with Australia's elite Special Operations command for use across a wide range of training and operational scenarios.

The 830R-SPL builds on previous generations of the 830R to feature:

- Integrated Henriksen lifting and painter hooks, allowing it to be launched and recovered from a parent ship while it is underway,
- Pneumatic "D" collar that allows a larger cargo area and three-abreast seating. This provides greater operational flexibility including the operation of autonomous systems, and
- The self-righting capability developed for Sentinel Boats' contract to provide a new fleet of sea boats for the Royal New Zealand Navy (RNZN).

Sentinel Boats is a world-leader in advanced tactical craft manufactured from HDPE. Their award-winning vessels are entirely Australian designed and manufactured together with One2three Naval Architects. Sentinels are in service across Australia and the world. Sentinel Boats won the Defence Award at the Australian Manufacturing Awards last October. They are producing 17 Sentinel 780Rs for the RNZN and were named NZ prime contractor of the year in 2023 for the delivery of high-speed Sentinel 1250 Littoral Manoeuvre Craft (LMCs) to the RNZN.

APDR *20 May 2026*

2026 Defence Industry Development Strategy

The Federal Government has released the 2026 Defence Industry Development Strategy, outlining how it will strengthen Australia's sovereign defence industrial base and boost self-reliance. Building on the record defence spending outlined in the 2026 National Defence Strategy and Integrated Investment Program, the Defence Industry Development Strategy outlines the Government's plan to build the industrial base needed to keep Australia safe.

The 2026 Defence Industry Development Strategy builds on the Government's plan to support a defence future made in Australia by:

- Setting targets for large defence primes to grow the defence industrial workforce, with a focus on apprentices.
- Enhancing broader workforce initiatives to grow the required skills, encourage the uptake of STEM learning, and strengthen partnerships between Defence, industry and the education sector. This includes:
  - Extending the Defence Industry Internship Program (DIIP) with more than $17 million in funding, ensuring more university students gain practical experience in Australia's growing defence industry.
  - Investing nearly $30 million to expand the Schools Pathway Program, encouraging school students to pursue science, technology, engineering and mathematics studies and explore careers in defence industry.
- Adding the Ghost Shark extra large autonomous underwater vehicle as a priority export capability for the Australian Defence Strategic Sales Office.
- Reforming and relaunching the US $3 billion Defence Export Facility, which has been under-utilised since its establishment in 2018, making it easier for Defence industry to access this pool of funds.
- Investing an additional $80 million in Defence Industry Development Grants to build self-reliance and support Australian defence businesses.
- Streamlining procurement to enable faster, more agile delivery of capability to Defence, including by implementing a 'Continuous Capability Development and Delivery' and 'Minimum Viable Contracting' approach.

Minister Conroy media release *2 Jul 2026*

"Rebuilding Defence Capability" reforms

The Australian government has released its *Rebuilding Defence Capability* report that sets out structured and practical reforms which will ensure that every dollar of investment is focused on value for money and greater speed to capability. The government said it is delivering on its commitment to fundamentally reset the development, acquisition and sustainment of Defence capability projects to ensure the Australian Defence Force (ADF) is equipped to keep our nation safe.

Since 2022, the Federal Government has brought the total additional investment from the 2024 National Defence Strategy and 2026 National Defence Strategy to $117 billion over the decade to 2035-36.

With this investment comes a clear responsibility to ensure Defence has the structures, focus and resources to deliver the right capability projects on time, within scope, and on budget. Defence personnel are central to implementing the 2026 National Defence Strategy and securing our nation, and these reforms seek to enable them to work to deliver capability for the ADF. These reforms have three central components:

- The establishment of the Defence Delivery Agency, a dedicated delivery organisation, headed by a new National Armaments Director, consolidating Capability Acquisition and Sustainment Group, Guided Weapons and Explosive Ordnance Group, and Naval Shipbuilding and Sustainment Group.
- The consolidation of capability development functions across all domains – land, air, maritime, space and cyber – under the Vice Chief of the Defence Force, to ensure we continue to deliver an integrated, focused force.

- A re-designed capability system which clarifies accountabilities and re-establishes decision discipline. This system will be underpinned by stronger contestability and improved cost estimation and assurance across the Defence Delivery Agency, Department of Defence and the Department of Finance.

On 1 July 2026, the Defence Delivery Group was established. It will provide independent, evidence-based advice to Government on delivery, strengthening Government's ability to make informed decisions and achieve best value for money and speed to capability. This has been missing in the past. The report sets out a clear implementation pathway for the next 12 months to transition the Defence Delivery Group to the Defence Delivery Agency, which will be established on 1 July 2027, to ensure it has the resources, accountabilities and autonomy needed to operate as an independent agency.

To support this transition, the Federal Government has appointed Ms Nadine Williams as the interim National Armaments Director.

These reforms are being undertaken in a deliberate, staged and structured approach to ensure that there is continuity in project delivery, and the uplift in the capability system can be realised quickly. This will reset the relationship between Defence and industry. Led by the National Armaments Director, engagement with industry will be more collaborative, transparent, and performance-based, providing clearer demand signals and stronger commercial discipline. For industry, this means clearer visibility of Defence's likely demand, priorities and direction of travel.

The Federal Government said it recognises the longstanding systemic challenges that have resulted in major Defence projects being delivered late, over budget, and below expectations. This created a widening gap between strategic need and realised capability. Alongside the 2026 Defence Industry Development Strategy, these reforms will help deliver a more integrated and resilient Defence enterprise that enables Australia to accelerate capability delivery and respond more effectively to emerging threats in support of Australia's national interest.

Deputy Prime Minister Richard Marles said:

> These reforms are about building a more agile, disciplined and strategically focused Defence organisation, one that is capable of responding to the strategic challenges we face and safeguarding Australia's security into the future. We are rebuilding a defence capability system that is disciplined, accountable and focused on outcomes. This is what Australia's security environment demands, and what the Australian people expect. These reforms will deliver what the Australian Defence Force needs faster and make sure every dollar we invest delivers real capability, and keeps Australians safe. There is no more important job for our Government than this.

Minister for Defence Industry Pat Conroy said:

> The *Rebuilding Defence Capability* report and the *2026 Defence Industry Development Strategy* will deepen and strengthen our partnership with Australian industry. Together these two documents lay out a new era for Defence – a sharper and more integrated enterprise, with defence industry as close partners in the mission to protect Australians and our way of life. For too long, Defence has struggled to deliver major capability projects on time and on budget. These reforms are about fixing that. They're the biggest in fifty years. We are putting in place clear accountabilities and improving leadership performance so Australians can have confidence that Defence will deliver what the National Defence Strategy demands.

APDR *2 July 2026*

Ocius Technology and UNSW launch second R&D project

Ocius Technology and UNSW Canberra are collaborating to develop advanced autonomous control systems for the Bluebottle Uncrewed Surface Vessel (USV) fleet to optimise its performance and power usage. The project is the second Defence Trailblazer supported R&D collaboration between Ocius and academics from the Decision Support & Analytics Research Group (DSARG) at UNSW Canberra. This follows work currently underway to rapidly scale up production of the Bluebottle USV fleet.

As a key supplier to the Royal Australian Navy (RAN), Ocius is continuing to deliver greater value to customers by driving down the resourcing required to operate the USVs. This project will focus on optimising power usage, sailing performance and autonomous decision-making for the Bluebottle vessels.

The project collaborators are developing a 'predict-then-optimise' power consumption model of the Bluebottle USV that integrates AI-driven predictions of vessel behaviour and an advanced autopilot capability, which will allow a single operator to manage multiple vessels simultaneously. The project aims to reduce operator workload, improve maritime surveillance efficiency and support future Defence capability requirements for autonomous and uncrewed systems.

By integrating a more advanced autopilot system, the Bluebottle will require significantly less human oversight, reducing crew workload and enabling the Navy to optimise its force structure. The model will incorporate predictions of sailing performance under varying conditions, management of propulsion systems for maximum efficiency, and a power model for optimum performance and minimised energy consumption.

Dr Ripon K. Chakrabortty, lead investigator and DSARG leader at UNSW Canberra identified that they will be working with Ocius operators and engineers to model the desired behaviour of the Bluebottle fleet. The verified model will then be tested and implemented into Ocius' vessel autopilot architecture.

As with the first R&D collaboration, this project is directly aligned with the 2026 Integrated Investment Program and will help fulfil the continued acquisition of Ocius USVs for the RAN's Anti-Submarine Warfare and its Intelligence, Surveillance, and Reconnaissance operations. This enhancement not only improves operational efficiency but also supports the ADF's broader objective of leveraging autonomous technologies to strengthen maritime capability

APDR *5 July 2026*

AUKUS-RELATED

Century Engineering wins first US Defence Export Nuclear contract

Century Engineering has become the first Australian business to secure export contracts into the United States naval nuclear supply chain. The South Australian manufacturer has been awarded contracts by HII's Newport News Shipbuilding to produce precision-engineered parts for US aircraft carriers, which are among the world's most complex and highly regulated defence platforms. Production of the crank components will begin within weeks. It is the first time an Australian company has delivered parts into a live nuclear-powered naval program, signalling a step change in Australia's role from prospector to participant within allied AUKUS supply chains.

Century Engineering's success follows its qualification to US naval nuclear standards through the Australian Submarine Supplier Qualification (AUSSQ) Program. Delivered by H&B Defence on behalf of the Australian Submarine Agency, AUSSQ is designed to identify, uplift and qualify Australian businesses to meet the exacting requirements of US and UK nuclear-powered submarine enterprises, creating a direct pathway into AUKUS-aligned programs.

To date, 13 Australian companies have qualified for inclusion in the US submarine industrial base through AUSSQ, and are responding to Requests for Quotation across priority areas including precision machining, casting and forging, and fabricated components. At the same time, AUSSQ has expanded to support the United Kingdom's submarine enterprise. A growing cohort of Australian businesses are now being assessed across 20 capability areas to support Royal Navy Force Rotations at HMAS Stirling from 2027, including sustainment of visiting Astute-class submarines.

Century Engineering's entry into the AUKUS ecosystem began through a pilot initiative jointly funded by HII and the South Australian Government, with targeted state grants accelerating its progression to nuclear standards. This milestone highlights the impact of coordinated investment in industrial capability, workforce skills and quality systems to unlock global defence opportunities.

APDR *17 May 2026*

Peter Garrett to lead independent review of AUKUS

The BBC has reported that Australia's former environment minister Peter Garrett recently initiated an independent inquiry into the programme that seeks to equip the Royal Australian Navy (RAN) with its own nuclear-powered attack submarine (SSN) force. Mr Garrett, who served as the country's environment minister from 2007 to 2010, said that an independent inquiry into the AU$368 billion (US$262 billion) AUKUS submarine programme was "long overdue."

Under the programme, which was itself recently amended, the United States will supply Australia with three in-service US Navy Virginia-class SSNs instead of the original arrangement of one newbuild and two in-service Virginias. The defence chiefs of Australia, the US and the UK said that the shift would simplify supply chain management and operational and maintenance requirements as well as maximise cost efficiencies.

The three Virginia-class boats would be complemented by SSN-AUKUS submarines, which are being developed jointly by Australia and the UK and are scheduled to become operational with the RAN in the 2040s.

Mr Garrett called the AUKUS submarine programme the "most expensive" defence investment made by Australia and criticised the fact that the parliament and the Australian people have not been given an opportunity to, "question, debate and decide," in relation to the programme. In addition to the former environment minister, four commissioners will participate in the inquiry. These include former Australian Defence Force Chief retired Admiral Chris Barrie and former Western Australia Premier Carmen Lawrence.

The independent review is being organised by local NGO Australian Peace and Security Forum.

Will Xavier, Baird Maritime *4 June 2026*

ASC Personnel continue submarine maintenance training in Hawaii

Two years after ASC deployed its first personnel to Pearl Harbor, more than 200 ASC employees are now undertaking Virginia Class maintenance training in Hawaii, and nearly 400 young people are in training – including 174 apprentices and 214 graduates – helping build the sovereign workforce Australia needs for its nuclear-powered submarine future.

A growing number of ASC assignees are already returning to Western Australia and applying those skills to submarine maintenance activities ahead of the commencement of Submarine Rotational Force – West (SRF-West) next year. As part of SRF-West, ASC will support the sustainment of up to four United States Virginia Class submarines and one United Kingdom Astute Class submarines rotating through HMAS Stirling at Garden Island in Western Australia. The international deployment program is a key part of ASC's efforts to develop the sovereign workforce Australia will need to sustain and build conventionally armed, nuclear-powered submarines under AUKUS, combining hands-on experience with international knowledge transfer, workforce growth and nuclear stewardship training.

ASC Chief Executive Officer Alex Walsh said the success of the Pearl Harbor assignment program showed Australia was already building the workforce needed for its nuclear-powered submarine future using more than 40 years of sovereign submarine experience developed through the Collins Class submarine program.

ASC is strengthening workforce pathways across the business, including graduate, apprentice and trainee programs, experienced-hire pathways, Collins Class upskilling, international placements, and nuclear stewardship training. The company is recruiting around 500 people each year as it grows its workforce from more than 3,200 employees today to a future peak of more than 8,000.

ASC is placing a strong focus on apprenticeships, graduates and traineeships. For aspiring engineers, technicians, trades specialists and support professionals, ASC offers a unique opportunity to build a lifelong career while contributing directly to Australia's national security.

APDR *12 July 2026*

WA Floating Dock for Submarines - Designer selection

AUKUS is taking another important step, with the Government selecting a designer for the submarine contingency dry dock capability in support of Australia's conventionally-armed, nuclear-powered submarine fleet. Leidos Gibbs and Cox Australia has been selected to lead the preliminary design for a contingency dry dock, which will be established in Western Australia to support our future nuclear-powered submarine capability.

This announcement reflects the Government's considered approach to delivering this capability and forms part of the Government's broader investment in Western Australia across HMAS Stirling and the Henderson Defence Precinct for sovereign shipbuilding and the sustainment of our surface vessels and submarines. Selecting the designer to provide floating dry dock design services will ensure Australia is ready to undertake critical repairs and maintenance for the nation's future nuclear-powered submarines from the early 2030s, ahead of the requirement to conduct submarine depot-level maintenance from the late 2030s.

This contingency dry dock capability is a critical pre-condition of Australia receiving its first Virginia class submarine and will provide a critical contingency capability for Australia and its partners. These vital maintenance capabilities will be established in accordance with domestic processes and regulatory requirements, and consistent with Australia's international obligations to maintaining the highest standards for nuclear safety, security and safeguards.

In addition to supporting a strong, sovereign industrial base, a contingency dry dock capability will play a vital role in ensuring Australia can sustain and operate its future submarine fleet and work with our partners in the United States and the United Kingdom to support security and stability across the Indo-Pacific region. This design work is underpinned by the Government's investment of an initial $12 billion to deliver the Defence Precinct at Henderson which, alongside the Government's record investments in AUKUS and shipbuilding, will support 10,000 direct jobs over the next two decades in Western Australia.

Defence Ministerial media release *29 July 2026*

Australian HY80 steel for USN submarines

Australian-made submarine grade steel will be used in the build of United States (US) Navy Virginia-class submarines for the first time, demonstrating the growing contribution Australian industry is making to the trilateral submarine industrial base under AUKUS. Bisalloy Steel has received a purchase order from US shipbuilder General Dynamics Electric Boat (GDEB) valued at approximately US$2 million for HY80 steel plate to support the production and construction of Virginia-class submarines. The order highlights the world-class capabilities of Australia's manufacturing sector and reflects the growing integration of Australian industry into allied submarine supply chains.

The landmark order follows Bisalloy's successful qualification to the US Navy's rigorous structural steel standards through the Australian Government's Defence Industry Vendor Qualification (DIVQ) Program. The DIVQ Program is helping Australian companies enter US submarine supply chains while strengthening Australia's sovereign industrial capability. The qualification process involved close collaboration between Bisalloy, BlueScope, the Australian Submarine Agency, GDEB and the US Direct Reporting Portfolio Manager for Submarines, to demonstrate Australian industry's ability to meet the stringent standards required for submarine construction. BlueScope manufactures the raw steel plate, while Bisalloy undertakes the specialised processing and heat treatment required to produce submarine-grade HY80 steel.

The US continues to expand capacity within its submarine industrial base and has identified steel supply as a key industrial priority. Australian industry participation supports this effort, strengthens resilience across the trilateral submarine industrial base, and creates new opportunities for local manufacturers.

The order will provide valuable production experience for Australian industry and position Australian companies to compete for future opportunities. It also demonstrates how AUKUS is delivering tangible benefits for Australian industry, supporting skilled jobs and building the industrial capability needed to underpin Australia's nuclear-powered submarine program.

Defence Ministerial media release *29 July 2026*

SHIP/BOAT-BUILDING & REPAIR

Incat Hull 096 Begins Journey to South America

Although sea trials on Incat Hull 096 completed in April, it has faced logistical delivery issues after the original heavy-lift vessel booked to transport the ship became stuck in the Persian Gulf due to the US-Iran conflict. Now another vessel, the 217-metre-long and 42-metre-wide transport ship MV *Black Marlin,* was secured to transport the electric ferry, dubbed *China Zorrilla* after the Uruguayan actress, from Hobart's River Derwent.

The heavy lift ship *Black Marlin* contracted by Incat to deliver Hull 096 arrived in Hobart late-July and the electric ferry was embarked on 31 July.

The world's largest battery-electric ship has now departed Tasmania, with Hull 096 leaving the River Derwent aboard the heavy lift vessel *Black Marlin* 5 August to begin its journey to South America.

The 130-metre vessel, designed and built by Incat Tasmania for South American ferry operator Buquebus, is expected to spend around 40 days in transit before arriving in South America, where it will be unloaded, commissioned and prepared to enter service between Buenos Aires and Colonia.

The departure marks another major milestone in the most significant project in Incat's history. Incat Chairman Robert Clifford said Hull 096 represented a defining moment not only for the company, but for the future of sustainable maritime transport.

> Today is a proud day for everyone at Incat. Hull 096 has been the biggest and most ambitious project in our company's history, and its departure is a testament to the skill, dedication and innovation of our entire workforce.
>
> I want to sincerely thank every person who has contributed to this extraordinary achievement.

> Thousands of people have played a part in bringing this remarkable vessel to life, and they should all be incredibly proud of what has been accomplished.
>
> We now look forward to seeing the world's largest battery-electric ship arrive in South America and demonstrate the enormous potential of large-scale battery-electric technology in commercial ferry operations.

Hull 096 is the largest battery-electric ship ever constructed and features the largest battery energy storage system ever installed on a vessel. The ship has capacity for up to 2,100 passengers and 225 vehicles and will operate for Buquebus on the River Plate between Buenos Aires, Argentina, and Colonia, Uruguay.

Incat Hull 096 about to be embarked on *Black Marlin*
(Image courtesy Încât)

With Hull 096 now bound for South America, work continues at the Incat shipyard in Tasmania on the world's most advanced aluminium electric shipbuilding program, with the company continuing to develop the next generation of battery-electric and hybrid-electric vessels.

Due to the size of the heavy-lift ship, Mr Clifford said the loading occurred in the deepest part of the River Derwent, The heavy lift ship, when partly sunk, was expected to be drawing about 23 metres.

Extract from Incat Insider Issue 097 *4 August 2026*

[Incat's head of projects, David Riseley, separately said the decision to wait for another heavy-lift ship was partly based on the need to preserve the structural integrity of the electric vessel that was constructed to run on a relatively calm river, so the vessel had not been constructed for heavy open-sea operation. By Editor from other sources]

Constructions starts on new Swan River WA Electric Ferries

A keel laying ceremony has been held for the first of five 24m electric ferries being built to take advantage of an expanded service on Perth's Swan River. The new ferries being designed and built by Henderson-based shipbuilder Echo Marine Group are part of the $107 million project which also involves creating two new terminals.

The keel laying ceremony in late June for this new METRONET on Swan Ferry Service Expansion project was an important milestone according to a joint federal and state media release, officially marking the start of vessel construction.

Each vessel has been designed to deliver a modern, accessible, and comfortable passenger experience, featuring onboard toilet facilities, bike storage, and external seating for passengers. These new electric ferries will be able to fit up to 100 passengers, have a maximum operating speed of 25 knots, and are designed to produce a low wake.

Artist impression Swan River electric ferry Perth
(Image courtesy Public Transport Authority WA)

Around 130 Echo Marine employees, including apprentices, are expected to work on the construction of the vessels.

Allen Newton, DCN *25 June 2026*

EV Marine joins Echo Marine Group for Swan River electric ferry fleet

A NEW Zealand maritime-technology specialist has joined the team delivering Western Australia's first electric ferry fleet, adding international expertise to the METRONET Swan River Ferry Service Expansion. Echo Marine Group has appointed EV Maritime as electric-propulsion systems integrator for the five new battery-electric fast ferries being built for the Public Transport Authority of Western Australia (PTA).

The 24-metre vessels form part of the largest-ever expansion of Perth's ferry network, under a $66 million design-and-construct contract awarded to Echo Marine Group in 2025. The ferries, designed by One2three Naval Architects, will be the first fully electric public-transport vessels in Western Australia.

EV Maritime will lead electrical systems integration, including power-conversion panels, vessel-management and power-management systems, and the project's data-intelligence platform. The company will also provide mechanical-systems engineering to support the electrification package.

EV Maritime's appointment introduces a new dimension to the Swan River project. The Auckland-based firm previously delivered all design, engineering and systems integration for Auckland Transport's first two EVM200 electric ferries, among the fastest fully electric passenger vessels in the world. The Perth project marks a strategic shift for the company, stepping away from vessel design to focus solely on engineering and integration for custom builds.

EV Maritime founder and CEO Michael Eaglen said the Swan River fleet represented a landmark in maritime electrification. EV Maritime chairman Damian Camp said the project demonstrates how the company's standardised driveline platform can be paired with custom naval-architecture solutions. Mr Camp said:

> The Swan River demanded a custom low-air-draft vessel, but when paired with our standard driveline system, we can now support naval architects and deliver high-confidence electric vessels worldwide.

Echo Marine Group project manager Anthony Livanos said EV Maritime's experience with high-voltage marine systems and electric-vessel deployment would help de-risk the project. EV Maritime's next-generation propulsion platform

is designed to reduce weight, improve space efficiency and simplify shipboard installation, a key factor in accelerating electrification across inshore commercial fleets.

The ferries will carry 100 passengers, operate at speeds up to 25 knots, and feature a low-wake hull form suited to the Swan River environment. The Swan River fleet is scheduled to enter service as part of the METRONET ferry expansion, alongside new terminals at Applecross and Matilda Bay.

Allen Newton, DCN *6 July 2026*

Austal turns to 3D Printing Research

West Australian based shipbuilder, Austal has thrown its weight behind a research program into making greater use of industrial grade 3D printing for components that would normally be cast or machined. The additive manufacturing collaborative research project is aimed at accelerating the adoption of additive manufacturing across Australia's maritime and defence supply chain, in a move the shipbuilder says will help industry make faster, more informed decisions about where the technology delivers the greatest value.

The $600,000 project brings together Austal, Curtin University and the Additive Manufacturing Cooperative Research Centre (AMCRC) to develop an industry-ready assessment framework capable of evaluating thousands of vessel and supply chain components against operational, commercial, technical and regulatory criteria. The 18-month program is designed to address one of the sector's most persistent barriers: knowing which parts are genuinely suited to additive manufacturing, and where investment will deliver measurable improvements in lead times, resilience and sovereign capability.

Austal head of research and development, Sam Abbott, said the challenge for industry is no longer proving that additive manufacturing works, but identifying where it delivers the greatest advantage. This framework will help us quantify the demand for additive manufacturing across maritime and defence programs, allowing industry to make better investment decisions, build more resilient supply chains and accelerate the uplift of Australia's advanced manufacturing capabilities.

Austal will draw on its experience as prime contractor for the United States Navy's Additive Manufacturing Centre of Excellence, providing global insights and real-world production data to support the research. Curtin University will lead the development and validation of the framework, ensuring it reflects real vessel configurations, maintenance cycles and supply-chain realities. Research lead Dr Karl Davidson said combining engineering, operational and commercial considerations into a single methodology would help manufacturers move more quickly from opportunity identification to implementation.

AMCRC managing director Simon Marriott said the project addresses a critical gap in industry capability: selecting the right components for additive manufacturing. Mr Marriott said:

> Many organisations understand the potential of additive manufacturing, but struggle to determine where it makes commercial and operational sense. This project will deliver a practical solution that helps industry identify high-value opportunities, prioritise investment and build confidence to scale adoption.

Additive manufacturing — often described as industrial-grade 3D printing — builds parts layer-by-layer from digital models rather than machining or casting them from bulk material. For shipbuilders and sustainment providers, the technology offers several potential advantages:

- Reduced lead times for critical spares and low-volume components
- Improved supply chain resilience, particularly for parts sourced from overseas
- On-shore or on-vessel production of selected components
- Repair and remanufacture of worn parts using directed-energy deposition
- Complex geometries that cannot be produced through conventional machining
- Digital inventories that reduce the need for physical stockholding

However, not every component is suitable for additive manufacturing. Suitability depends on factors such as material type, certification requirements, geometry, load conditions, production volume, and the commercial cost-benefit compared with traditional methods. This is why the framework is significant: it provides a repeatable, evidence-based way to determine where additive manufacturing should be deployed.

Allen Newton, DCN *29 June 2026*

New cranes for Cairncross Dockyard

THE QUEENSLAND government has allocated $4.5 million from the state's Sovereign Industry Development Fund for the acquisition of two large cranes for the revitalised Cairncross Dockyard in Brisbane. The investment through the flagship $180.6 million Fund will see 1,200-tonne and 400-tonne cranes equip the facility with the heavy-lift capability needed to undertake large-scale defence and commercial vessel maintenance, repair and sustainment activities in Queensland, the government says.

This will support delivery of the broader $2.5 billion Cairncross Dockyard project, which the Government has declared a prescribed project to help streamline approvals and support the re-establishment of a major graving dock on the Brisbane River for maritime maintenance.

The Cairncross Dockyard on Brisbane's southside was established in 1942 during World War II and has Australia's second-largest graving dock (behind Cockatoo Island, Sydney) capable of accommodating ships up to 85,000 DWT. The dock was closed in 2014 and the land proposed for redevelopment as housing or other use. However, it was later acquired by Cairncross Dockyard Brisbane, a subsidiary of Texas Tea Queensland, and in December last year the government declared the site's revitalisation a prescribed project, clearing the way for faster approvals.

The installation of the 1,200-tonne crane will provide the heavy-lift capability needed to operate the new lift-in/lift-out (LILO) dock gate for the graving dock and will also provide the capacity to lift vessels up to 600T from the graving dock pool to support commercial and defence maritime operations.

The 400-tonne support crane will be used to establish the 1,200-tonne crane on site and support dockyard construction and quayside operations.

Dale Crisp, DCN *12 July 2026*

New Australian-designed stern landing vessel completes beach trials

A new stern landing vessel (SLV) designed by Australian naval architecture firm Seatransport has completed conducted beach landing trials earlier this month. The 73-metre *Matilda 1* performed beach landing and de-beaching manoeuvres on Dundee Beach southwest of Darwin, dropping her ramp on the shore and holding position. She then successfully de-beached and headed out to sea in under 60 seconds.

The stern landing vessel *Matilda 1* with her stern ramp lowered during beach landing trials at Dundee Beach, Northern Territory, July 8, 2026
(Photo courtesy Seatransport)

Seatransport said that this is the world's first beach landing of an SLV optimised for military use, and that the landing and de-beaching also proved the SLV's capability in challenging littoral environments where seabed conditions and large tidal flows impact accessibility for conventional bow ramp landing craft. The activity was conducted with US Marine Corps personnel on board and observed by members of the Australian Defence Force.

A week prior, *Matilda 1* successfully passed dry out berthing trials in the mangrove mudflats of Hudson Creek, an estuary waterway in Darwin. Seatransport said that, during both the beach landing and dry out berthing activities, the SLV's tri-hull design protected the stern gear and prevented the hull suction effect that affects conventional flat-bottomed landing craft.

Matilda 1 will be operated under a three-year lease with the US Marine Corps, primarily within the Asia-Pacific.

Gareth Havelock, Baird Maritime *14 July 2026*

DECARBONISATION

Port Hedland to China, BHP tests Tallow as a fuel

The Australian low-carbon liquid fuels (LCLF) company HAMR Energy has successfully participated in a pilot project with BHP and the Global Centre for Maritime Decarbonisation (GCMD) to introduce blended biofuel produced from waste tallow (livestock by-products) and used cooking oil as a lower-emissions alternative for shipping across Australia and the broader Asia Pacific region.

The pilot saw a BHP-chartered vessel carrying iron ore depart Port Hedland, Western Australia bound for China fuelled by the Australian biofuel feedstock. The trial is designed to provide insights into blended biofuel's technical performance, traceability and scalability, and highlights the importance of expanding feedstock options to accelerate the supply of lower-emissions fuels and strengthen long-term fuel security.

HAMR Energy played a central role in the pilot, managing fuel certification, supply chain and logistics, working with Australian biodiesel producer JustBiodiesel to source Category 1 tallow and deliver biodiesel to meet project requirements. Together, the project demonstrates how close collaboration across the value chain can investigate the opportunity for practical, credible low-emissions fuel solutions.

Byrge Lyngor Fuel Trial
(Photo courtesy HAMR)

The BHP-chartered bulk carrier, Berge Lyngor, was fuelled with a B100 bio-blend comprising 50 per cent waste tallow and 50 per cent used cooking oil supplied by Mitsui & Co Energy Trading Singapore (METS). The blend is expected to deliver an approximately 79% reduction in lifecycle greenhouse gas emissions on a well-to-wake basis per voyage compared with a conventional very low sulphur fuel oil. As demand for biofuels grows, diversifying beyond heavily utilised feedstocks such as used cooking oil will be critical to scaling supply.

HAMR Energy news release *2 June 2026*

INTERNATIONAL

International Maritime Organization's (IMO) Maritime Safety Committee (MSC) 111th session 13 – 22 May 2026

The MSC 111th session was held from 13 to 22 May 2026 at IMO Headquarters in London. Key outcomes from MSC 111 relevant to Australia are outlined below:

Adoption and approval of amendments

Notably MSC 111 adopted the following amendments:

- SOLAS Chapters IV and V to require dissemination of maritime safety information and SAR-related information through all operational recognised mobile satellite services, and to introduce VDES as an alternative to AIS
- 2011 ESP Code to enable the use of Remote Inspection Techniques (RIT) for close-up surveys of bulk carriers and oil tankers
- 1994 and 2000 HSC Codes to introduce VDES as an alternative to AIS
- 1988 Load Lines Protocol to update requirements for guard rails on deck structures

- IP Code to increase the assumed personnel weight in stability calculations from 75 kg to 90 kg
- LSA Code to introduce design and prototype test requirements for free-fall lifeboat release systems during simulated launching
- IMDG Code with multiple amendments in line with the biennial update process

All amendments will enter into force on 1 January 2028. Where appropriate, these will be incorporated into Australia's domestic legislation, typically through Marine Orders.

MSC 111 also approved:

- Revised interim guidelines for the use of fibre-reinforced plastic in ship structures
- Revised explanatory notes on safe return to port for passenger ships following fire or flooding
- Revised Guidelines on maritime cyber risk management, along with a work plan to develop a non-mandatory maritime cyber code

Maritime Autonomous Surface Ships (MASS)

MSC 111 finalised and adopted the non-mandatory International Code of Safety for Maritime Autonomous Surface Ships (MASS Code), supporting the safe integration of AI-enabled and remotely operated ships. The Code will take effect from 1 July 2026.

The Code comprises three parts: prescriptive requirements in Parts I and II, and goal-based provisions in Part III, covering safety and security matters alongside existing instruments such as SOLAS. The Committee also reaffirmed key provisions relating to remote operations centres (ROCs), including alignment with STCW standards and recognition of ROCs as locations associated with the bridge and machinery space.

Next steps include:

- 2026: Development of an Experience-Building Phase (EBP) framework
- 2028: Development of a mandatory MASS Code based on the non-mandatory Code and EBP outcomes
- 2030: Expected adoption of the mandatory MASS Code
- 2032: Expected entry into force

Australia is considering early implementation of the non-mandatory Code ahead of the mandatory version.

Safe delivery of IMO's GHG reduction strategy

MSC 111 approved interim guidelines to support alternative fuels, including:

- Safety of ships using hydrogen as fuel
- Safety of ships using ammonia cargo as fuel
- Training for seafarers on ships using methyl/ethyl alcohol and ammonia as fuel

A consolidated version of the Revised Interim Recommendations for the carriage of liquefied hydrogen in bulk was also adopted. Australia contributed significantly to this work in collaboration with Japan.

MSC 111 further approved work plans for the SDC and CCC Sub-Committees, including:

- Guidelines for ships using battery energy storage systems
- Guidelines for wind propulsion and wind-assisted power
- Revision of SOLAS Chapter VIII and the Code of Safety for Nuclear Ships
- Revision of guidelines for alternative fuels following the experience-building phase

Review of the financial architecture of the Long-Range Identification and Tracking (LRIT) system.

The LRIT review is being undertaken in two phases, with completion targeted for 2026.

Draft amendments to SOLAS Chapter V were approved to introduce a free-of-charge policy for LRIT information for entitled coastal States, with adoption expected at MSC 112 and entry into force on 1 January 2032.

New work outputs

MSC 111 agreed to undertake following notable outputs:

- Amendments to recommendations on the safe use of pesticides in ships, informed by past incidents
- Amendments to the LSA Code to clarify safety harness colour requirements for free-fall lifeboats
- Amendments to SOLAS Chapter II-2 to clarify reduced ventilation rates in container cargo spaces carrying dangerous goods
- Revision of harmonised reporting procedures for marine casualties and incidents to align with best practice

The IMO website also provides a summary of MSC 111 outcomes, available here.

Greg Pusey, AMSA by email *23 June 2026*

Singapore's carbon-fibre ship feat

A Singapore shipyard has built the largest composite structure ever assembled for a vessel in the country's history, and it is destined for a warship designed to command fleets of robots at sea. Penguin Shipyard International completed and delivered the first of six carbon fibre composite superstructures on June 27, 2026, handing the massive assembly over to Swedish defence firm Saab for integration into the Republic of Singapore Navy's new Multi Role Combat Vessel, known as the MRCV, a class of ship the Navy is building to replace its aging Victory-class missile corvettes that have served since 1989.

Saab describes the finished piece as the largest composite ship structure ever built in Singapore and one of the largest anywhere in Asia, a claim tied directly to the sheer scale of the MRCV itself, a 150-meter (492-foot) vessel with a displacement of roughly 8,000 to 8,400 tonnes (8,800 to 9,250 tons) depending on the source, making it the largest and most complex warship Singapore has ever constructed.

The composite piece covers the ship's forward superstructure and integrated mast rather than the entire vessel, a distinction that matters because the rest of the MRCV's hull remains conventional steel, built separately by Singapore's ST Engineering at its Benoi Yard, where the first ship in the class, also named Victory, launched in October 2025. Saab manufactured the raw composite sheets at its facilities in Sweden and shipped them to Singapore, where Penguin's engineers fitted and fabricated them into the finished superstructure before sending the completed assembly to ST Engineering Marine for final integration onto the steel hull,

a manufacturing chain that spans two continents before the pieces ever come together into a single warship. The forward mast alone weighs roughly 60,000 kilograms (132,000 pounds) and had to be shipped from Sweden in disassembled flatpack sections because no single piece could be transported whole, underscoring just how large this composite assembly actually is compared to the aluminium hulls Penguin has built throughout its history.

Composite superstructures are not a new idea for Saab, which previously supplied similar carbon fibre structures for the Republic of Singapore Navy's eight Littoral Mission Vessels, commissioned between 2017 and 2020, using a design the company calls the Saab Lightweight Integrated Mast. What makes the MRCV project different is scale and partnership, since this marks the first time Penguin, a Singapore shipbuilder founded in 1976 and known as the world's largest builder of IMO-registered aluminium commercial ships, including armoured security vessels, has taken on composite construction or any naval defence project at all. Composite materials like carbon fibre offer real advantages over steel for a warship's upper structure, cutting weight by roughly half according to figures cited by Singapore's Ministry of Defence, which lowers the ship's centre of gravity and improves stability while freeing up weight margin that engineers can use later to add new equipment as the MRCV's mission requirements evolve over its service life.

Penguin's Managing Director James Tham framed the delivery as a turning point for the company's own capabilities rather than just a milestone for the MRCV program itself. This milestone marks the successful completion of Penguin's first composite shipbuilding project and our first naval defence project. The capabilities developed through this project will be integrated across our broader shipbuilding operations, strengthening our ability to undertake more advanced programmes in the future.

Saab's own executives emphasized a different set of advantages, ones that speak directly to how the composite material changes what the finished warship can do in combat rather than just how it performs in the water. Daniel Oscarsson, head of Saab's Business Unit Surface Ships, pointed to benefits that extend well beyond weight savings alone. Oscarsson said:

> By integrating composite superstructures into naval ships, our customers benefit from advantages such as low weight, decreased radar cross-section and reduced life-cycle costs.

A reduced radar cross-section means the ship is harder for an adversary's radar to detect and track at long range, a stealth characteristic that composite materials can achieve more easily than steel because they can be shaped into smoother, radar-deflecting forms without the seams, rivets, and protrusions that complicate a traditional metal hull. That capability matters for a vessel designed to operate as what Singapore's Ministry of Defence calls a mothership, a warship built to launch, control, and recover fleets of unmanned surface vessels, aerial drones, and underwater vehicles rather than fighting primarily on its own, since the MRCV's mission bay can hold eight containerized modules that let the Navy reconfigure the ship's capabilities for different missions within a short turnaround.

The MRCV program itself represents one of the more ambitious naval shipbuilding efforts underway in the Indo-Pacific region, with Singapore's Defence Science and Technology Agency overseeing a design that combines a modern frigate's combat capability with an operational range exceeding 7,000 nautical miles (13,000 kilometres) and endurance beyond 21 days at sea, roughly double the range of the Formidable-class frigates the MRCV will operate alongside. Construction is already underway on the second, third, and fourth vessels in the six-ship class, with steel cutting on the third and fourth hulls completed in April 2026, and deliveries to the Republic of Singapore Navy are expected to begin in 2028.

Australian Naval Institute *July 5, 2026*

Austal progress on wind-powered cargo trimaran

WEST Australian-based shipbuilder Austal's Philippines division has reached a major milestone in the construction of a ground-breaking, wind powered, cargo-carrying trimaran. The 67-metre VELA wind-powered trimaran is a next-generation cargo vessel designed to slash emissions on tran-Atlantic routes. The aluminium hull, assembled and turned earlier in the build program, is now progressing through outfitting as the project moves toward its scheduled 2027 commercial launch.

The vessel is being developed for French operator VELA, with naval architects VPLP Design and MerConcept providing the multihull and sail technology.

VELA's trimaran is engineered to operate on 100% wind propulsion, supported by solar generation and hydrogenerators.

The vessel's six-sail rig provides 6705 square feet of sail area, delivering an average operating speed of 14 knots with a claimed 99% reduction in greenhouse gas emissions compared with conventional diesel-powered cargo ships.

The trimaran configuration offers enhanced stability and speed, enabling the vessel to maintain reliable schedules on its planned weekly transatlantic service between Normandy and Bordeaux and New Jersey. With capacity for 415 tonnes and up to 500 pallets per week, VELA is targeting high-value, low-volume cargo including pharmaceuticals, cosmetics, luxury goods, aerospace components and temperature-controlled consignments. The operator expects the vessel to move around 30,000 pallets per year in each direction.

Global logistics provider DHL Global Forwarding France has already committed cargo space as part of VELA's "pioneer cohort", signalling early commercial confidence in wind-powered freight.

The project marks a significant diversification for Austal, traditionally known for defence vessels and high-speed ferries.

The VELA build demonstrates the shipbuilder's capability in emerging decarbonisation markets and highlights the growing role of its Balamban, Cebu shipyard in international innovation programs.

VELA has indicated the vessel is on track for delivery in early 2027, with the operator already promoting a countdown to service commencement.

Allan Newton, DCN *20 July 2026*

Receipt of Non-Binding Conditional Offer to acquire Austal USA

Austal Limited advises that it has received an indicative, non-binding and conditional offer from Hanwha to acquire the business operations of Austal USA.

The proposed purchase would be achieved through the acquisition of 100% of the shares in the relevant Austal USA holding entities or such other agreed transaction structure.

The Proposal does not contemplate the acquisition of any publicly traded shares in Austal or Austal's core Australasia operations based in Australia, the Philippines and Vietnam. The Strategic Shipbuilding Agreement entered into with the Commonwealth of Australia in August 2025, which appointed Austal as the Commonwealth's sovereign strategic shipbuilder for key defence vessels at Henderson, Western Australia, under a 15-year framework agreement, is fully preserved and unaffected by the Proposal, ensuring continuity of Austal's sovereign shipbuilding mandate and the long-term value it delivers to Australian shareholders and the Commonwealth.

Under the Proposal, Hanwha has offered to acquire Austal USA for an indicative enterprise value of US$1.05 – 1.20 billion on a cash and debt-free basis, subject to a normalised level of working capital and other customary transaction adjustments.

The Proposal is subject to several key conditions, including:

- Satisfactory completion of due diligence by Hanwha,
- Regulatory approvals including, as required, Committee on Foreign Investment in the United States ("CFIUS"), Defense Counterintelligence and Security Agency ("DCSA"), Hart-Scott-Rodino Antitrust Improvements Act ("HSR"),
- Agreeing definitive transaction agreements, and
- Other customary transaction conditions.Page 5 of 6

The Proposal is not subject to a financing condition.

The Austal Board and its advisers have carefully assessed the Proposal including the net cash proceeds expected to be delivered to Austal after allowing for tax and other transaction leakage. The Austal Board has determined to provide Hanwha a four-week period, commencing from the date that due diligence information requested by Hanwha is made available, to:

- Undertake due diligence related to Austal USA (including a review of Austal USA contracts and the announced trading update),
- Engage with key counterparties including the United States Department of War and US
- Navy/US Coast Guard, and if required, the Australian Department of Defence, and
- Progress transaction documentation to enable Hanwha to present a more certain proposal.

Should a more certain proposal be received from Hanwha, that proposal will be assessed by the Austal Board, having regard to the inherent value of Austal USA, and acting in the best interest of all Austal shareholders.

The Proposal was received prior to this Market and Trading Update. There is no certainty that a further proposal will be received, or that if a further proposal is received, it will result in a definitive agreement. Austal will continue to update the market in accordance with its continuous disclosure obligations.

[The foregoing is an extract by the Editor, from a more complete Austal market and trading update addressing a range of issues including the Hanwha Proposal.]

Austal Limited Company Announcement *11 August 2026*

SHIP OPERATIONS

ANL Kokoda first ship in Australia's Strategic Fleet

On 29 May, the Albanese Government announced it has secured the first vessel in its Maritime Strategic Fleet, the *ANL Kokoda*. The *ANL Kokoda*, a large cargo ship, will be the first to participate in the Strategic Fleet Pilot Program. This sovereign shipping capability will help strengthen Australia's economic sovereignty and improve national security.

The vessel will be available to Australian Government agencies to requisition in times of need, emergency or crises, such as natural disasters and supply chain disruptions. The *ANL Kokoda* will be on hand to deliver supplies, equipment and be able to assist when Australian communities or industries need it most. As part of the five year pilot, the vessel will become Australian-flagged and crewed, helping to re-build our national shipping industry. It will bolster resilience and help grow our sovereign maritime workforce ensuring we have the skills and capabilities to operate our ports and maritime services into the future.

ANL Kokoda at Townsville for the strategic fleet announcement. (Image courtesy ANL)

The *ANL Kokoda* is the first vessel in the Strategic Fleet Pilot Program. The Government will continue to work with industry to procure additional vessels for Australia's maritime capacity.

The Strategic Fleet is the central component of a broader program of work that aims to revitalise the Australian maritime industry. This includes the establishment of the Maritime Skills and Training Initiative, cracking down on wage theft aboard foreign-flagged ships, and reviewing the Coastal Trading Act.

[By Editor: The Maritime Executive website identifies that the *ANL Kokoda* is a 23,314 dwt containership with a capacity of 1,740 TEU. Originally operated by German shipping interests, the ship, which was built in 2011, has been sailing

since 2022 for ANL Shipping Singapore with routes that included Australia.]

Minister for Infrastructure media release 29 May 2026

Battery hybrid limestone carrier commences operations

Canadian shipping company the CSL Group has taken delivery of a new self-unloading bulk carrier built by Jiangjiang Nanyang Shipyard in China. CSL said *Yampu* is the world's first battery-powered self-unloading bulk carrier. The ship has departed on her maiden voyage to commence operations for cement manufacturer Adbri in Birkenhead in South Australia.

The purpose-built ship was designed to transport approximately 2.7 million tonnes of limestone each year for Adbri. CSL said this marks an increase of 35 per cent over her predecessor.

Yampu has an LOA of 121 metres (397 feet), a moulded beam of 23.7 metres (77.8 feet), a draught of 4.5 metres (15 feet), a moulded depth of nine metres (30 feet), a deadweight of approximately 11,000, and a gross tonnage of 9,602. The vessel was designed for high efficiency and is equipped with advanced hybrid propulsion technology, thus making her the world's first battery-powered self-unloading bulk carrier, according to CSL.

The company expects that the ship will reduce diesel consumption by 25 per cent and cut scope I emissions by 40 per cent compared to the ship she will replace. The hybrid propulsion system consists of a main diesel engine and a 6.7MWh battery pack. CSL President and CEO Louis Martel said the vessel will initially run on this hybrid diesel and battery system, replacing 25 per cent of diesel with electric power and lowering scope I emissions by 40 per cent compared to Adbri's earlier limestone carrier *Accolade II*.

Yampu battery hybrid limestone carrier
(Photo courtesy CSL Group)

Approximately 50 per cent of the vessel's energy requirements will be provided by a combination of shore power and battery energy storage, though Martel said that, by 2031, the vessel will be able to operate fully on electrical power, thus enabling scope I emissions reductions of as much as 90 per cent. *Yampu* was built in compliance with Lloyd's Register class requirements. The ship is owned and operated by CSL but sails under the Australian flag and is crewed by Australian seafarers. She will support Adbri's activities at Birkenhead under a 20-year strategic partnership.

TECHNICAL

New members of AMSA Board

The Minister for Infrastructure, Transport, regional Development and Local Government, The Hon Catherine King MP, announced on 27 May 2026, the appointment of Dr Carla Boehl and Dr Devinder Grewal to the Australian Maritime Safety Authority (AMSA) Board.

Dr Carla Boehl brings strong industry experience to the board as a lecturer and associate for WA School of Mines at Curtin University while also serving as the Senior Manager of Utilities Facilities Engineering and Net Zero at Pfizer. Dr Boehl also previously served as Manager of Asset Strategy and Planning at Fremantle Ports.

Dr Devinder Grewal joins after more than a decade of experience as a professor at both the Australian Maritime College and World Maritime University. He is an experienced consultant to the international transport logistics and supply chain industry.

Daryl Quinlivan AO, an existing board member, has also been elevated to Deputy Chair for the remainder of his term. Daryl has served as a member of the AMSA Board since 2021, having previously served as Secretary of the then Australian Government Department of Agriculture and Water.

These appointments create certainty and continuity of skills as AMSA delivers on its mission to ensure the safe operation of vessels, combat marine pollution, and provide lifesaving assistance to people in distress. In a time of uncertainty in international shipping stemming from the ongoing Middle East conflict and its effects on Australia's maritime sector, it's heartening to have strong, experienced leadership at the helm of the nation's peak maritime safety body.

Dr Boehl and Dr Grewal's appointments are for three-year terms. For more information on AMSA and its Board, visit www.amsa.gov.au.

Minister for Infrastructure media release 27 May 2026

Greg Witherall appointed as Executive Director Operations at AMSA

The Australian Maritime Safety Authority has announced the appointment of Mr Greg Witherall as its executive director operations, highlighting his background as a master mariner and having more than 30 years' relevant experience. Mr Witherall began his career in Canada's fishing industry before progressing to captain in the international cruise sector. Since joining AMSA in 2010 as a port marine surveyor, Mr Witherall is said to have helped shape AMSA's approach to maritime safety regulation, seafarer welfare and industry engagement.

Greg Witherall
(Photo courtesy AMSA)

AMSA chief executive Kaylene Dale said Mr Witherall's appointment reflected his deep maritime expertise, proven leadership and longstanding commitment to maritime safety, environmental protection and seafarer welfare.

His appointment, following a competitive process, strengthens AMSA's ability to deliver modern, risk-based regulation that protects lives at sea, safeguards Australia's marine environment and supports productivity, resilience and sustainability across the maritime sector. During his time at AMSA, Mr Witherall has helped strengthen Australia's maritime regulatory capability, improve services for seafarers and industry and modernise certification through the myAMSA platform, making it easier and faster for people to enter the industry. He has also led regulatory action to protect seafarer welfare and ensure maritime employers meet their lawful obligations.

Mr Witherall said he was honoured to lead Australia's national maritime regulatory operations. He said:

> AMSA plays a critical role in protecting lives at sea, safeguarding Australia's marine environment and supporting a strong and sustainable maritime industry. Australia relies on a safe, resilient and efficient maritime sector. I look forward to working with industry, governments and maritime stakeholders to strengthen safety outcomes, uphold seafarer welfare standards and maintain confidence in Australia's maritime regulatory system.

As executive director operations, Mr Witherall leads AMSA's national regulatory operations, including vessel inspection, compliance and enforcement activities that help uphold safety standards, protect seafarers and passengers, and safeguard Australia's marine environment.

David Sexton, DCN *6 July 2026*

Marine incident data highlights safety risks across Australia's fleet

The Australian Marine Incident Annual Report 2025 analyses marine incidents across domestic commercial vessels (DCVs), foreign-flagged vessels (FFVs) and regulated Australian vessels (RAVs), identifying trends across the entire fleet over the past five years. In 2025, we received 4,174 marine incident reports, providing a whole-of-fleet view of where safety risks are emerging and how they are changing over time to inform safer operations.

What's driving marine incidents

Across the fleet, marine incidents are most often linked to routine vessel operations and system reliability. Collisions, groundings, and power, propulsion and system failures remain among the most common incident types.

Operational shortfalls were involved in over half of DCV marine incidents, most commonly related to vessel control and navigation, including maintaining an effective lookout. Technical failures, particularly involving power, propulsion and steering systems, continue to present a consistent risk across all vessel types.

These patterns show that many marine incidents occur during everyday activities, where gaps in onboard practices, planning or maintenance can increase risk.

The impact on people

Behind every marine incident is the potential for serious harm.

In 2025, DCV marine incidents resulted in 4 fatalities, 228 injuries (including 44 serious injuries), and 92 person overboard incidents. That's a 19% increase in person overboard incidents compared to 2024.

Across RAVs and FFVs, a further 206 injuries were reported, the majority involving crew. The most serious injuries were linked to operational activities, particularly navigation on DCVs, and maintenance, operational access and cargo handling on RAVs and FFVs.

These outcomes highlight the real-world consequences of breakdowns in safety controls, especially during everyday tasks where risks can be underestimated.

Why this matters

Understanding what is driving marine incidents helps vessel owners, operators and crew focus on where action will have the greatest impact, strengthening onboard procedures, maintaining vessel systems, and managing risks before incidents occur. Every marine incident report contributes to a clearer understanding of emerging risks across the fleet. These insights help target compliance and education activities to improve safety outcomes.

Read the full report on the AMSA website to see what these trends mean for your operations.

AMSA News and Updates *25 June 2026*

BMT acquires One2Three Naval Architects

BMT has acquired Australian naval architecture business One2three Naval Architects, further strengthening its position in independent global commercial and specialist vessel design. The acquisition expands BMT's ability to support customers delivering complex vessel programs across international markets and broadens its strengths in maritime design across ferries, specialist craft, autonomy and advanced vessel technologies.

Founded in 2005, One2three has delivered more than 300 vessels across over 30 countries and is recognised internationally for its expertise in highly efficient hull form design and high-performance ferries. The Sydney-based business has established long-term customer relationships across Australia, Europe, Asia, the United Kingdom and the United States, with experience spanning commercial ferries, para-military craft, luxury yachts and battery-powered vessels.

The acquisition brings together complementary maritime design expertise and strengthens BMT's position as a global maritime design and technical consultancy. Existing customer relationships, delivery teams and active projects will continue without disruption, ensuring continuity while providing customers with broader engineering support, expanded delivery resources and increased international reach.

The acquisition further scales BMT's global ship design offering and strengthens its ability to support globally distributed shipbuilding programs across multiple international markets. Customers will benefit from increased access to globally connected design and engineering teams, enabling faster program responsiveness, closer collaboration with shipyards and geographical alignment with our customers.

The investment supports BMT's long-term strategy to grow its ship design strengths globally and respond to increasing demand for advanced, efficient and sustainable vessel solutions across established and emerging markets.

The combined vessel design portfolio of One2three and BMT means enhanced support to shipyards, operators and maritime customers across key international markets.

Graeme Nayler, Regional Business Director, APAC at BMT, said:

> Over more than three decades, One2three has built a formidable reputation in commercial and specialist vessel design, including world-leading work in high-speed aluminium ferries and advanced multihull craft. Bringing that expertise into BMT, alongside our global engineering, consultancy and lifecycle heritage, strengthens the way we support customers as vessel programmes become more complex and internationally connected.
>
> This is a deliberate, long-term investment in maritime design excellence and innovation and, following our acquisition of AMT, a further step in BMT's sustained growth across the Asia-Pacific region. Together, it deepens our independent ship design expertise and our ability to work alongside customers and shipyards worldwide, particularly as demand grows for commercial shipbuilding and ferry capability in markets such as the United States.

Steve Quigley, Managing Director at One2three Naval Architects, said:

> One2three has always focused on delivering high-performance vessel designs that meet the operational needs of customers and shipyards internationally. Joining BMT strengthens our ability to scale that experience globally while maintaining the responsiveness, technical quality and customer focus that define our business.
>
> Access to BMT's broader international engineering network, Ai initiatives, technical knowledge and lifecycle support creates significant growth opportunities for our people, our customers and the markets we support.

The acquisition increases the scale, resilience and global reach of BMT's ship design offering while strengthening its presence across major international maritime markets. Customers will benefit from local support, deeper technical knowledge, , and greater access to globally connected engineering resources aligned to evolving market and shipyard requirements.

Being stronger together, these combined capabilities enable BMT and One2three the ability to support the next generation of commercial and specialist vessel programs with technically excellent solutions.

BMT News *23 July 2026*

[Although not reported in *The ANA* at the time, in November 2024 BMT announced that it had acquired Australian Maritime Technologies (AMT), an independent, wholly Australian-staff owned naval design and marine engineering consultancy based in Melbourne. Specialising in engineering, design, and consulting services for marine projects, AMT has built a strong reputation for high-quality service delivery, which strengthens BMT's capabilities in ship design and engineering for defence and commercial maritime customers. The synergies between BMT and AMT position them to deliver advanced solutions, combining BMT's global reach with AMT's depth of Australian expertise. With a team of around 60 highly skilled professionals, AMT's experience in naval ship design spans a wide range of combatants, auxiliary, and specialist vessels. It also played a key role as the ship designer in the mid-life combat and platform systems upgrades for the Royal New Zealand Navy's ANZAC Class Frigates. Ed]

NAVAL ARCHITECTS ON THE MOVE

The recent moves of which we have been advised or become aware are:

Michael Andrewartha has moved on from Electro Nautic and, for a time from 2024 as the Principal of Innovacean in Perth, was on contract to One2three Naval Architects for the design of a 57m Adventure Sailing Catamaran. His current role is with IMDEX in Perth as an Engineering Manager leading the mechanical engineering of mining drilling technology.

Peter Hayes has recently commenced long term leave as he transitions to retirement in early 2027 from his stability role within the Directorate of Navy Engineering in the Department of Defence in Canberra. A significant portion of Peter's later career within Naval Engineering has been in managing ship stability of the RAN surface fleet.

Caitlin Hoey had moved on from the Naval Technical Bureau of the Department of Defence quite some years ago initially taking up a naval architect role with QinetiQ Australia before moving to a role with QinetiQ at Gosport in the UK. More recently she was promoted to Naval Architecture & Maritime Engineering Group Lead with QinetiQ.

Adrian MacMillan has moved on from Woodside Energy after many years and has returned to DNV in Perth as Senior Principal for Energy Transition.

Nik Parker continues as General Manager Member Services for Boating Industry Association Ltd, operating from the Adelaide area.

Aminur Rashid moved on from the Air Warfare Destroyer SPO in Canberra several years ago, and following some time with KPMG has returned to the Department of Defence working on LAND8710, the Australian Army Landing Craft project.

(continued on p.51)

New US-made, Incat Crowther designed passenger ferry now in service in US Virgin Islands

Spirit of 1733, a new state-of-the-art, EPA tier 4 compliant 104-foot (32-metre) passenger ferry designed by global digital shipbuilder Incat Crowther for the U.S Virgin Island's Department of Public Works has entered service. The new vessel is operating on a busy tourist and commuter route between Red Hook on the island of St. Thomas and Cruz Bay on the island of St. John in the U.S Virgin Islands.

Named after a historic slave rebellion on the island of St. John in 1733, the USCG Subchapter-K approved vessel will join two existing Incat Crowther-designed 28-metre passenger ferries that have been operating on the route for over a decade.

Built by Gulf Craft LLC in Louisiana, USA, *Spirit of 1733* has been designed with accessibility, performance and passenger comfort in mind and is capable of transporting up to 300 passengers at speeds of up to 28 knots. The vessel is equipped with the latest diesel engine emission control technologies in compliance with Environmental Protection Agency (EPA) Tier 4 standards.

Spirit of 1733
(Image courtesy Incat Crowther)

The air-conditioned main cabin features seating for up to 202 passengers, including five dedicated wheelchair-accessible spaces, two ADA-compliant bathrooms, and a fully enclosed luggage room. Integrated side boarding ramps are provided to ensure safe and efficient boarding and disembarkation. The upper deck offers spacious outdoor seating for up to 100 passengers, while the wheelhouse provides the captain with an excellent line of sight, 360-degree visibility, and wing helm stations to assist with safe docking operations.

Commissioner of the U.S Virgin Island's Department of Public Works Derek Gabriel said: We are incredibly pleased with the positive impact that Spirit of 1733 has since entering into service. From the outset, we wanted a ferry that was designed specifically for our routes, our ports, and the conditions our operators and passengers deal with every day. Incat Crowther has delivered on that brief with *Spirit of 1733* connecting our communities, supporting commerce between districts, and giving residents andvisitors a more dependable way to travel between St. Thomas and St. John.

Incat Crowther USA Managing Director Grant Pecoraro said the delivery of Spirit of 1733 further strengthens Incat Crowther's proven track record in the Caribbean. Spirit of 1733 is another example of our track record of partnering with local operators and shipyards to create locally made, bespoke vessels. This US-made vessel is a modern, efficient and accessible addition to the U.S Virgin Islands' fleet.

Specifications

Length Overall	104.3ft/31.8m
Length Waterline	100.7ft/30.7m
Beam	28ft/8.53m
Draft Hull	4.67ft/1.42m
Draft Max	7ft/2.13m
Depth	9.83ft/3m
Construction	Marine Grade Aluminium
Fuel Oil	2000 gal/7570 litres
Urea	200 gal/757 litres
Fresh Water	500 gal/1900 litres
Black Water	500 gal/1900 litres
Deadweight	37t
Passengers	300
Crew	5
Speed (Service)	28.0 knots
Range	450nm @ 24 knots
Main Engines	2 x Caterpillar C32
Installed Power	2 x 895 kW at 1,800-2,100 rpm
Emissions	EPA Tier 4
Propulsion	2 x Fixed Pitch Propellers
Gearboxes	2 x Twin Disc MGX6620
Generators	2 x Caterpillar C4.4
Flag	United States of America
Class / Survey	46 CFR Subchapter-K

Incat Crowther media release *19 May 2026*

***Ottalauss* – Compact waterjet workboat to support salmon farming in southern Australia**

Australia's Huon Aquaculture has taken delivery of a new general-purpose workboat built by local company Lyndcraft Boats. *Ottalauss* was designed by Australia/New Zealand naval architecture firm Oceantech to be capable of supporting Huon's fish farming operations in southern Tasmania.

The vessel was built for 24-hour operations, in part due to the fact that performing certain routines (such as harvesting) at night would provide a higher level of animal welfare. Abundant deck lighting and adequate deck space meanwhile help facilitate a safe working environment in these conditions, as does a dedicated external helm, which is particularly useful when working in close proximity to pens.

Ottalauss follows Huon's Viking-inspired naming tradition of her predecessors. The designer, Oceantech, advised that the name is a combination of the Norse words ótti ("fear") and laus ("free from"/"without"), hence the name translating into "fearless" and, "suit[ing] the vessel's unfazed confrontation with 24-hour operations in the 'roaring forties.

Huon's salmon farming enterprise is characterised by low-density fish pens, resulting in an operation that covers a large swathe across the southern coast of Tasmania. In Oceantech's view, this means *Ottalauss* will frequently perform offshore transits to service different farms and to do so safely and swiftly. Once at the farm, the range of duties as a support vessel call for a robust work platform. Thus, a compromise to deliver effectively on these fundamental

Ottalauss fish farm workboat
(Photo courtesy Oceantech Design)

tasks is vital. Oceantech explained that *Ottalauss* is the fourth vessel in a series, as Huon had opted for a proven design enhanced with further refinements. Standardisation in a fleet drives efficiency and cost savings, in both maintenance and operational procedures, so the familiar platform of a Cummins-driven Hamilton waterjet boat was a given.

To minimise transit times in extreme environments without sacrificing crew comfort, a balance needed to be achieved between making the vessel strong enough to endure years of abuse and keeping structural weight within an acceptable limit to achieve the desired performance. *Ottalauss* therefore boasts 8mm aluminium plating on both the hull bottom and the topsides, up to the main deck, which Oceantech said is a notable upgrade from the 6mm plating on her predecessors. Part of addressing the effect of this additional weight was to optimise the local reinforcement of supporting structure for the crane base and capstan winches. In this case, an increase in crane capacity, and the commensurate increase in supporting structure, had the potential to impact the vessel's performance both at speed and at rest. A new custom crane pedestal was designed, with the help of FEA software, to ensure structural efficiency, while a comprehensive stability analysis confirmed there would be no adverse impact on performance.

Attention was also paid to the "build-ability" of the vessel throughout. *Ottalauss*' construction took advantage of lessons gleaned from previous iterations, built through a partnership between Crisp Bros and Haywards and Oceantech, incorporating minor adaptations, "for a near seamless construction process."

The vessel is powered by two Cummins QSL9 engines that each drive a Hamilton HJ322 jet via a ZF 325-1 gearbox. This configuration delivers a transit speed of 25 knots, while the application of jets allows for tender manoeuvring around pens upon arrival.

As with Huon's other vessels that are under 24 metres (79 feet) long, Ottalauss is fitted with a Simrad navigation suite consisting of dual screens for charts and radar. The deck equipment meanwhile includes a Fassi crane.

Baird Publications *16 Jun 2026*

Construction underway on US-designed and built 48m catamaran ferry for Hy-Line Cruises

Construction on a new 48-metre, bespoke catamaran passenger ferry designed by global digital shipbuilder Incat Crowther for US operator Hy-Line Cruises is now underway.

The new vessel, which is being built by Midship Marine in Louisiana, will operate on Hy-Line Cruise's critical tourism and commercial routes connecting Hyannis, Massachusetts, with the islands of Martha's Vineyard and Nantucket.

Capable of transporting up to 493 passengers across three spacious passenger decks, the vessel is capable of reaching speeds in excess of 30 knots and has been designed specifically for the unique local conditions experienced off the coast of Cape Cod.

48m ferry for Hy-Line Cruises
(Image courtesy Incat Crowther)

The commissioning of the new 48-metre vessel builds on the more than 30-year partnership between Incat Crowther and Hy-Line Cruises, which has seen Incat Crowther design and deliver five unique, bespoke, robust, operationally reliable and efficient vessels for the US operator. The new vessel will build on this successful partnership, which has played a significant role in the success and growth of Hy-Line Cruises' operations.

The vessel is powered by four Cummins QSK60-M Tier 4 engines driving four Hamilton HTX65 waterjet units, meeting US emissions standards for domestic ferry operations. Composite shafting supplied by Driveline Service of Portland is incorporated into the drivetrain, reducing weight and maintenance requirements. The aluminium hull and superstructure construction supports the vessel's performance targets, ensuring efficient and safe operations and features active ride control technology supplied by Naiad.

Passenger amenity has also been a key focus of the design process. The vessel's main deck offers spacious indoor seating for 166 passengers and boasts a large 87 square-metre luggage room complete with a dedicated bicycle rack. The mid-deck features indoor seating for 154 passengers as well as covered and heated outdoor seating for 88 passengers. The vessel's wheelhouse deck offers a commanding forward view for the vessel's captain and crew while also offering heated outdoor seating for 140 passengers. Passenger flow across the vessel has been enhanced via multiple indoor and outdoor staircases connecting all three passenger decks.

Construction on the new vessel is expected to be completed by 2028.

Specifications	Încât Crowther 48m
Length Overall	157' 5" /48.0m
Length Waterline	149' 11" / 45.7m
Beam Overall	34' 5"/ 10.5m
Draft	6' 10" / 2.1m
Depth	14' 1" / 4.3m
Construction	Marine grade aluminium
Fuel Oil	4000 gallons / 15 000 litres

Fresh Water	660 gallons / 2 500 litres
Sullage	660 gallons / 2 500 litres
Indoor seating capacity	344
Outdoor seating capacity	200
Total maximum passengers	493
Speed (Service)	31.5 knots
Speed (Max)	34 knots
Main engines	4 x CUMMINS QSK60-M
Installed power	4 x 2500hp / 1864kW @ 1800rpm
Propulsion	4 x Hamilton HTX65 Waterjets
Gearboxes	4 x Twin Disc MGX 61500 SC HL/HR
Flag	United States of America
Reg Authority	USCG
Regulations	46 CFR Subchapter K Type 5A Passenger Spaces (Very Low Fire Load)

Incat Crowther press release *26 June 2026*

VP03 Foil equipped coastal and offshore patrol vessel for Victoria Police

The Victoria Police recently took delivery of a new patrol vessel built by Q-West Boat Builders of Whanganui, New Zealand. The all-aluminium VP03 is the latest example of a series of patrol vessels designed by New Zealand-based Teknicraft for government operators in both Australia and New Zealand. She is also the third boat to be built by Q-West for the same operator and even has a nearly similar design but is slightly longer with a different layout.

Improved performance combined with ample liveaboard facilities

The vessel will be operated along the south coast of Victoria and into Bass Strait. She is therefore designed to operate up to 150 nautical miles offshore, and her design and certification fully comply with [Australian Maritime Safety Authority] NSCV [requirements] for a class 2B vessel.

VP03 has an LOA of 18.6 metres (61 feet), a beam of 6.8 metres (22 feet), a draught of only 0.8 metre (2.6 feet), and space for up to six personnel.

The owner's brief was to provide a vessel with a top speed of over 40 knots, together with an economical cruising speed. It needed overnight accommodation for a mixed crew of six persons in separate cabins. It also needed a large wheelhouse seating five crew, a galley, and dining and mission planning areas.

Nic de Waal, Managing Director at Teknicraft remarked that all of the requirements were successfully incorporated, and the vessel's performance well exceeded the expectations.

Advanced foiling system adaptable to a range of sea states

The vessel is fitted with Teknicraft's dynamic hydrofoil system, which enables the operator to adjust the foil's lift and drag properties with the touch of a button. De Waal said this capability ensures that the dynamic lift is always optimised depending on whether the vessel is loitering, cruising, or pursuing at high speed. The foil can also be adjusted to suit the sea state environment in which the vessel is operating.

The propulsion setup consists of two Scania DI16 810kW (1,100hp) diesel engines coupled to Hamilton HJ403 waterjets via Turret cardan shafts instead of gearboxes. Fuel is fed from tanks with a total capacity of 7,000 litres (1,500 gallons).

VP03 underway
(Photo courtesy Q-West Boat Builders)

The performance of the vessel is exceptional with a two-way averaged maximum speed of 44.5 knots," de Waal told Baird Maritime. "What is even more impressive is that the vessel can cruise in fully laden condition at 32 knots using only 58 per cent power, with fuel consumption of only 6.8 litres (1.5 gallons) per nautical mile. The fuel consumption is almost constant, varying from only six to seven litres (1.3 to 1.5 gallons) per nautical mile over a large speed range of between 24 and 34 knots.

Layout and systems offering enhanced situational awareness

This vessel was also designed to maximise its viewing and reconnaissance capabilities by placing the wheelhouse on an upper deck with 360-degree viewing. The wheelhouse itself has forward-leaning windscreens to help reduce glare from the helm station and to reduce reliance on wipers when operating under inclement weather conditions. For enhanced situational awareness under nighttime or other low-visibility conditions, the crew will rely on a Furuno radar and a mast-mounted rotating thermal camera.

VP03 SPECIFICATIONS

Type of vessel:	Patrol vessel
Classification:	NSCV 2B
Flag:	Australia
Owner:	Victoria Police, Australia
Designer:	Teknicraft Design, New Zealand
Builder:	Q-West Boat Builders, New Zealand
Hull construction material:	Aluminium
Superstructure construction material:	Aluminium
Deck construction material:	Aluminium
Length overall:	18.6 metres (61 feet)
Beam:	6.8 metres (22 feet)
Draught:	0.8 metre (2.6 feet)
Main engines:	2 x Scania DI16, ea 810 kW (1,100 hp)
Propulsion:	2 x Hamilton HJ403 waterjets
Maximum speed:	44.5 knots
Cruising speed:	32 knots
Radar:	Furuno
Type of fuel:	Diesel
Fuel capacity:	7,000 litres (1,500 gallons)
Accommodation:	Cabins; mess; galley
Crew:	6
Operational area:	Southern Victoria, Australia

Baird Maritime *12 August 2026*

UNSW Canberra

As this news is consumed, we will be deep into Semester 2 with students fully engaged in their academic work. The specific naval architecture field trips are broadly behind us, except for three of our final year students travelling with Sean McCracken to Perth for the RINA Warship Conference, 30 September to 1 October. They will present in a session created to allow them to showcase their final year projects (FYPs) and capstone designs (via presentations and posters). This will be executed like the student-oriented sessions run very successfully at the last two IMC conferences. The students involved and their featured works are:

- SBLT Luke Reidy (FYP - Experimental Evaluation of Towed Open Water Submarine Hydrodynamic Testing, Capstone Design - Frigate)
- SBLT Ethan James (FYP - Design and Build of a SWATH Towing Vessel for Open Water Model Testing, Capstone Design - SWATH)
- SBLT Parth Khanna (FYP - Observing the Effects of Aft Control Surface Sizing on Passive Hydrodynamic Stability, Capstone Design - Corvette)

Exciting news on the staffing side is that lengthy recruitment action has been very productive, with two offers recently being accepted by candidates who are due to start with us in November and January respectively. I look forward to being able to share more about them, including their bios in future ANA editions. We are thrilled by the expansion of our team to five, and I look forward in part to handing off metaphorical batons to them as I ease out to some degree. One will take over the hydrodynamic teaching responsibilities and the other the ship structures content in our revised program.

From 2027 our unique eight naval architecture courses within the BE (Naval Architecture) (with Honours) program will follow a new sequence, shown at below.

After four years of delivery and in view of continuous improvement and supporting program development, a revision of the BE (Naval Architecture) degree was recommended by the teaching team and accepted by the Sponsor and the University. The overarching objectives remained constant: To offer a best-practice, grey ship focused naval architecture degree in support of Australian sovereignty, continuous naval shipbuilding and AUKUS. However, a morphing evolution of course arrangement and content was proposed and will be achieved. The revision sought to achieve several things. It balances the student workload with two specialist naval architecture core courses in each semester of 3rd and 4th year. Four content streams are created in the process – these being foundational, hydrodynamics, structures and design. The content repackaging was also done with a conscious awareness to shape modules for potential offerings aligned with future postgraduate, short course and micro-credentialling opportunities. The revision gives more room to imbed content related to modern simulation and analytical tools such as FEA and CFD. Finally, it includes a new core capstone design course, namely Warship and Submarine Design. This serves to meet the request to increase submarine content made by our sponsor.

Work is also continuing in preparing for the accreditation visit of Engineers Australia in October. We hope to impress the Panel with what has been achieved over the last five years of delivery with four graduating classes to be on the record by the close of 2026. Given these graduates now on the books from our program, we anticipate upgrading our provisional accreditation status given five years ago to full accreditation for 2027 and beyond.

In closing this relatively brief report, I again invite all interested stakeholders to engage with us as we attempt to make a difference in meeting national objectives in things maritime.

Associate Professor Warren Smith
Naval Architecture Program Coordinator
School of Engineering and Technology
UNSW Canberra

Year	Semester	Course Code	Course Name	Stream
3	1	ZEIT3750 ZEIT3754	Hydrostatics, Stability and Practice Ship Resistance and Propulsion	Foundational Hydrodynamics
3	2	ZEIT3755 ZEIT3756	Marine Engineering and Ship Systems Seakeeping and Manoeuvring	Foundational Hydrodynamics
4	1	ZEIT4753 ZEIT4754	Ship Structures Ship Design	Structures Design
4	2	ZEIT4755 ZEIT4756	Ship Building, Acquisition and Sustainment Warship and Submarine Design	Structures Design

THE PROFESSION

FINITE ELEMENT ANALYSIS SOFTWARE: UNDERSTANDING ITS LIMITATIONS AND WHY ENGINEERING JUDGMENT STILL MATTERS

By John Kecsmar

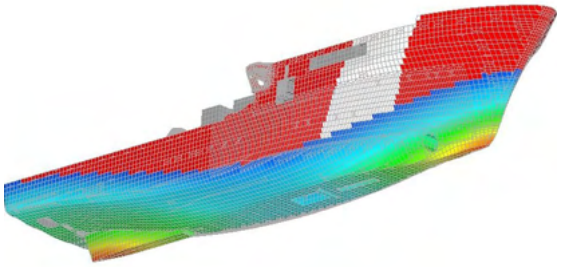
Reprinted by permission of Baird Maritime

Today's naval architects face ever-increasing distractions with modernity.

It seems that with increasing computing power, the allure of using programs like finite element analysis (FEA) for structural analysis is beyond commonplace; it is a must. Advertisements by software companies highlight the ease with which complex structures can be analysed, making it difficult to ignore, for most at least, anyway.

The seamless transition of creating a model in one software to then importing the model into the same or another software to begin the process of analysing the structure via FEA looks like child's play. In fact some software programs do all the work for you. All one is required to do is press the buttons and presto! The answer is provided!

If it were only that simple.



(Image courtesy Vard Marine)

So, what is FEA, and when should we use it? Is it even worth bothering with hand calculations, since everything in the modern design office is performed using these ever more powerful computers inside a digital environment?

Let's address the basics. The finite element method is a mathematical method that can be used to obtain solutions to complex engineering problems. The analytical solutions to problems in general require the solution of ordinary or partial differential equations that, because of the complex geometries, applied loads and material properties, are too complex to be solved using hand calculations.

The concept behind the finite element method is to find the solution of a complex problem by replacing it with a simpler one. In reducing the problem to a simpler one, an approximate solution rather than an exact solution is obtained.

Without getting too detailed and complex, it can be broken down into two basic approaches. The first, the principal of virtual work, is the most fundamental tool for the analysis of statically indeterminate structures; it also has the advantage of being able to deal with conditions outside of the elastic range.

The second is based upon strain energy that can provide solutions of complex problems for which exact solutions may not exist. So, in this simple breakdown, if this is starting to sound like a university lecture, then good! Since most users simply plug and play and "assume" everything is correct, why, because it is FEA, it must be correct. Nothing could be farther from the truth, however.

The objective of FEA is to accurately determine the response of a system modelled with finite elements given the applied loads and boundary conditions. But since we now know that FEA does not provide "exact" solutions, how can we trust it? This is where the link between mathematical modelling using the finite element method and the physical world – by addressing the constraints and methods of modelling in order to provide more accurate solutions that can be verified by experimentation – come into play.

Selection of element types (2D or 3D how many degrees of freedom, etc), the application of loads, as well as the manner in which the model is restrained to reflect the true physical model all have an influence on the results obtained. It is therefore vitally important that the user of such software can understand these limitations as well as the effects of such that are required in order to provide results that are consistent and verifiable.

Again, in simple terms, try modelling a simple beam as a flat bar that is structurally built-in at one end and a simple point load is applied at the free end.

The chances are that a first-time user of such software, or indeed, perhaps even a more experienced user, would find that the results obtained by the FEA do not match that of a simple hand calculation. This then begs the question, "Why not? what is wrong?"

And this is the whole point. Without a background in structural analysis using matrices and higher degree polynomials, it won't make any sense. The way the model is restrained (held) has a major influence on the result, as does the means in which the force is applied to the model – at one node at the end, maybe? Just like the simple structure drawing, and not forgetting the all-important type of element used.

This goes down an even more complex discussion on shape-functions. All structures deform under load, and whether the shape of deformation can be created mathematically via higher order polynomials is the basic premise. This is not basic algebra.

The above is merely scratching the surface of a very complex use of mathematics to solve very complex problems using even more complex concepts of mathematics. The more one delves into the theory, one realises that it is not as exact as one is led to believe.

So, we go back to the beginning. Given what we now know, that FEA is not so straightforward, does not provide exact solutions, requires a deep understanding of how elements behave (no two are alike) – unless one is extremely well versed in knowing how to "guide the model" – and the time taken to manually create the model and mesh (not using the automatic function), when done correctly, would it be worth it? Well, it is a fair point.

Yet it is so easy to be beguiled by adverts and social media posts by users showing how wonderful the colour plots can be and the simplicity of clicking from a model into the FEA side, thus providing an instant answer. Some of the software programs available offer very little regarding the means to control the FEA; that would otherwise yield an exact solution,

or very close to it, once one understands the theory of FEA. But of course, why let facts get in the way of a sale or a colourful promotional plot of a complex structure?

The simple bottom line is this. Any complex structure can, with experience, be broken down into very small simple beams, like a simply supported or built-in beam. Having the ability to recognise how to break down a complex structure into a series of "simple" beams may not be an "exact" solution (sounds familiar?), but it is a solution one can trust and verify, and this is a skill in itself.

It may be considered to be over-engineered. However, also factoring in the time to arrive at an answer in order to establish whether a structure is safe or not, and to do so within a production time scale, is far more valuable. Hand calculations win hands down.

If this seems like a negative dig at FEA, it is far from it. Rather, it is a cautionary tale that using such powerful software is not as simple as, "press the button and go". It requires training and understanding the theory behind it far beyond the sales blurb in the user manual.

Having used FEA for over 30 years, I still do not profess to know everything about it. However, what I do know is how to control the model manually, not relying on automation and selecting the correct element types and applying the boundary conditions and loads, in a manner that is "consistent" and yields a result that is offering an idea of what one should expect the structure to behave like (supported by simple hand calculations) and thus plan mitigation accordingly.

It is not an absolute, but an indication of what is kind of *likely* to occur.

[John Kecsmar is a Japan-based naval architect known for his high-speed craft work. - Ed]

THE PROFESSION

TELLING A BETTER STORY - ONE OF ENGINEERING AS A LIFE OF PURPOSE

This article by RADM Katherine Richards AM RAN (Rtd) HonFIEAust CPEng EngExec, Chief Engineer of Engineers Australia, appeared in the EA Create journal on 19 June 2025 and is re-printed by kind permission from the author.

Australia needs 60,000 more engineers by 2035, and we won't reach that target – let alone solve the complex global challenges we face – if we keep recruiting from only half the population. To mark International Women in Engineering Day, Chief Engineer Katherine Richards AM HonFIEAust CPEng reflects on how gender equality is a strategic imperative.

Chief Engineer, Engineers Australia Katherine Richards AM, CSC
(Photo courtesy EA create)

I joined the Royal Australian Navy in the late 80s to study engineering driven by equal parts curiosity and conviction. I wanted to understand how things worked, live a life of service and do something different. The Navy offered a strong sense of purpose – of putting others before self – and the promise of an extraordinary education. That resonated.

Unlike other young women at the time, I had a role model. My mother had joined the Navy in the 1960s, one of the first three women in Australia to enter as a direct-entry officer. A fully qualified chartered practising accountant – an almost unheard-of feat for a woman at the time – she was still seen as fit only for administrative and secretarial roles. And when she married my father, she was forced to resign. That was the rule: married women couldn't serve.

Fast forward just one generation, and her daughter – me – would not only be accepted into the Navy as a mechanical engineer but rise through its ranks to become an admiral. When I look back now, especially on days like International Women in Engineering Day (INWED), I see this not just as personal progress but as a collective achievement. It's the result of generations of women pushing against invisible walls and of good people – men and women – changing systems to create space for others.

A challenging start

When I started out in the late 1980s, things were very different from my mother's time but still very challenging. The Australian Defence Force Academy was a new and demanding institution. The attrition rate in my mechanical engineering cohort was staggering: 23 of us started, men and women alike, and I was the only one to graduate on time. The days began at 5.30am, filled with military training, academic rigour, physical fitness and endless contact hours. It was tough. But that experience forged a level of resilience in me I still carry to this day.

My early years in marine engineering were also just as intellectually challenging and physically demanding. Warships are not built for comfort; they're built to fight. I worked below deck, running the ship's engineering plant – without which a vessel can't float, move or fight. I was, at that time, one of only a handful of women in that domain and the first to become qualified as a charge marine engineer. There weren't even boots in my size or overalls that fit. It sounds trivial now, almost quaint, but it's symbolic. Women were expected to fit into a system built by and for men. Literally and figuratively, the uniform didn't fit.

Standing on the shoulders of giants

Though my mother didn't get to wear the uniform for long, her belief in service and in the value of women's work shaped me. She told me that watching her daughter become an admiral was something she could never have imagined. And that's why I'm here – because so many women like her challenged the status quo and decent men were prepared to embrace change and share power.

Every time we do this, we invest in the future of the people who will follow us. We effectively scaffold future opportunities for them. Thanks to these women, today we have no shortage of role models. We have women engineers making huge advances on the core issues facing our country: from national security to decarbonisation to advanced manufacturing and the circular economy.

It's no longer unusual to meet a woman engineer and they are usually given uniforms that fit. So, from when I started in the 1980s we can be proud of the progress made.

Progress is not the same as completion

There is still a pay gap: that's real. There's also still a participation gap: only 16 per cent of people working in engineering occupations in Australia are women. That's something we need to fix.

It's not about ticking boxes or fulfilling quotas. It's about fairness and opportunity, necessity and national capacity. We need 60,000 more engineers in Australia, and we won't reach that target – let alone solve the complex global challenges we face – if we keep drawing only from half the population.

So there's still a long way to go. But how can we address these issues?

Acknowledge that the systems we've built contain biases

Many biases are unintentional but still harmful. From pay gaps to parental leave penalties to career interruptions, women face a different professional terrain. It's not enough to say "the door is open" when the path to it is strewn with obstacles.

We need to actively strip back those systemic biases and redesign our institutions to be more inclusive – for everyone's benefit.

Everyone plays a part

I've been lucky to work with some amazing men in my career who have helped me push myself and supported me to grow. These were men who said, "it's not enough to be 'not sexist'; we need to provide active support."

So, to the many men of our profession, I say: be an ally. Start the conversation with your female colleagues. Ask what support looks like for them. Then listen. Don't project your views onto a conversation and don't volunteer to solve a woman's problems or issues based on your analysis. That type of behaviour really is a recipe for a disastrous conversation.

Instead, when it is your turn to speak, just humbly ask the simple question: "What do you think I could do better to support you to achieve what's right for you?" Then act on what you learn. Engineers are problem-solvers by nature. We can apply that same mindset to addressing gender inequity in the profession. This is a problem that demands your skillset.

Change the story from the start

If we want more women in engineering, we must start earlier. There's been a decline in the number of girls taking up STEM subjects in high school. This isn't just a pipeline issue – it's a narrative issue. We must tell a better story, one that reflects the reality of engineering as a life of purpose.

Because engineering isn't just about numbers or machinery or some academic view of systems and networks. It's about delivering safe drinking water, building sustainable infrastructure, ensuring national security, and connecting communities.

It's a deeply human profession, one that underpins every part of our lives. And yet we often only notice it when it fails. That's the irony of engineering – it's ubiquitous and invisible. To change the perception, we must show how profound its impact is. That's how we ignite passion in the next generation of young women.

Eliminate the parenting penalty

Another major hurdle is the parenting break, which disproportionately affects women. We must rethink how we talk about this. Taking time off to raise children is not a "loss" of skill – it's a gain. Parenthood teaches resilience, prioritisation, emotional regulation and long-term thinking. These are leadership qualities. They are not liabilities; they are assets. Employers must learn to recognise that – and so must women returning to the workforce.

I remember having to correct one of my colleagues when I returned from taking some long service leave after having a baby. He asked me how my holiday had been and why I looked so tired. I said I had not been on holiday but instead had been working 24/7 loving a baby. In all reality, he just needed someone to adjust his perceptions of work. It was up to me to not let that opportunity slide.

Today: Looking to the future

The engineering profession faces challenges more complex and urgent than ever before – from the energy transition to climate resilience, from infrastructure renewal to advanced manufacturing. Solving these challenges demands more than technical expertise; it requires diverse thinking, inclusive collaboration and bold leadership. That means we need every mind at the table – and that includes the 50 per cent of the population who are women.

We can't wait for someone else to do it for us, or some initiative to come along. Individually, we need to dismantle barriers when we see them. Nobody can afford to be a bystander.

We can't build a sustainable, innovative, and equitable engineering future without embracing gender diversity as a strategic imperative.

The future of engineering in Australia depends on a workforce that reflects the society it serves. That means building systems and cultures that support participation, progression and purpose for all. From classrooms to boardrooms, from submarines to skyscrapers, engineering must be a place where everyone can thrive.

International Women in Engineering Day is a chance to pause and reflect – but it must also be a catalyst. Because building the future starts now. And it must include everyone.

MEMBERSHIP - AUSTRALIAN DIVISION COUNCIL

The Australian Division Council of the Royal Institution of Naval Architects met on Tuesday 16th June by zoom conference. This was the first meeting chaired under the new President Mr Sammar Abbas. Sammar opened the meeting by acknowledging the sterling work undertaken by Mr Rob Gehling as the division secretary over the last 17 years and welcomed the new members of council. It should be noted that Rob's input to the Division was in fact greater than 17 years, prior to service as the Division secretary he was President and a council member before that. The President reviewed all outstanding actions, processes and procedures to ensure alignment and mutual understanding for new Council members.

Discussion at the Council meeting included:

The Presidents Priorities

The President outlined his priorities for his term of office. These priorities which are outlined in his Australian Naval Architect column for the May edition, consist of improving membership value and enhancing the advocacy for naval architects. The President welcomes any comments or suggestions to achieve these objectives.

Improvement Working Group

It was noted that the improvement working group had delivered a significant number of ideas and suggestions on the way forward for the Division. Council determined that the working group should be restructured to move into the next phase of implementation to enhance member value. It was noted that the membership of Council, as well as section committees is undertaken by volunteers so any activities should be managed in "bite size" chunks to ensure effectiveness and not overburden the volunteers.

John Jeremy Essay Competition

Council noted the excellent contribution from the Naval Historical Society in the development of a competition to recognise the outstanding impact John had on their society. It was agreed that the Australian Division would support the concept by widely distributing the call for essays and details can be found within this edition of *The ANA*.

Accreditation of Australian Naval Architectural degree programs

It was reported that there are several concerns about the accreditation of Australian naval architecture degree programs for entry as a chartered engineer with the Engineering Council in the UK. The President agreed to raise the concerns during his next meeting with the CEO and determine the way forward to resolve this item.

International Maritime Conference at INDOPAC

Planning for the next IMC is currently underway for the event to be held between 2nd-4th November 2027. Whilst early to report on significant progress there may be changes to the well-oiled event run during John Jeremy's leadership due to security implications. (Note: the event timing falls in between the Rugby Union World Cup Quarter and Semi-finals in Sydney – hopefully this does not impact hotel process too much – book early.)

The next Australian Division Council meeting is set for Tuesday, 15th September via Zoom.

It was agreed that the Australian Division Council should align with RINA's branding. To this end it was agreed that the division email address would change to Australiandivision@rina.org.uk rather than a gmail account. Please use this email for all further communication with the division. Branding of RINA documents has been circulated to the section secretaries for implementation.

Stuart Cannon

Secretary

E: Australian.division@rina.org.uk

P: 0403 221 631

NAVAL ARCHITECTS ON THE MOVE (CONT. FROM P.43)

Adrian Woodhouse, previously the Principal Engineer for the Anzac SPO between 2010 and 2024 had moved to a role within the Warship Asset Management Agreement Alliance in Henderson in 2024, progressing to their Chief Engineer position in 2025. His current role with the Department of Defence is as the inaugural Engineering Manager establishing the Maritime Sustainment Model 2.0 for the Major Surface Ships Engineering Management Unit.

This column is intended to keep everyone (and, in particular, the friends you only see occasionally) updated on where you have moved to. It consequently relies on input from everyone. Please advise the undersigned when you up-anchor and move on to bigger, better or brighter things, or if you know of a move anyone else has made in the last three months. It would also help if you would advise Stuart Cannon (australiandivision@rina.org.uk) when your mailing address changes to reduce the number of copies of *The Australian Naval Architect* emulating boomerangs.

Trev Ruting and Martin Grimm

E: truting@bigpond.com

RINA, Division, and Sections – Committee Members and Representatives

To keep members up-to-date with who is doing the hard yards on their behalf within the Institution in Australia, current council, section committee members and other representatives are as follows:

RINA Board of Trustees

Member	Martin Renilson

RINA Council

Vice President Pacific Region	Martin Renilson
Members:	S Abbas (ex off)
	Jim Black
	Martin Renilson

Developing Careers Committee	Emma Tongue
IMO Committee	John Manning
Maritime Safety Committee	Rob Gehling
Membership Committee	Danielle Hodge
Professional Affairs Committee	Jim Black
Publications Committee	Hamed Majidiyan

Division Council

President	Sammar Abbas
Vice-President	Vacant
Members Elected/Appointed:	Hossein Enshaei
	Ken Goh
	Martin Grimm
	Andrew Harris
	Bruce McRae
	Martin Renilson
Members Section-Nominated:	N Bentley (Qld)
	Vacant (SA-NT)
	A Broadbent (N)
	R Boult (Tas)
	Tim Speer (WA)
	Vacant (Vic)
	X Ling (ACT)
Observer (non-voting)	Jim Black
Immediate Past President	J Binns (ex off)
Secretary	S Cannon (ex off)
Treasurer	CBoulton (ex off)

Division Improvement Working Group

Chair	Sammar Abbas
Members:	Andy Harris
	W Malinowski
	M Woodward

Division Investment Committee

Chair	Craig Boulton
Member	Nick Bentley

Division AMSA DCV Liaison Working Group

Chair	Rob Gehling
Members:	10 (confidential)

Walter Atkinson Award Panel

Chair	Michael Squires
Members:	Dan Curtis
	Alan Muir
	Lily Webster

Standards Australia Committee CS114 (Small Craft)

Member	Peter Holmes

Standards Australia Committee ME059 (Shipbuilding)

Member	Adrian Macmillan

Offshore Racing Congress – Int.l Tech C'ttee

Member	David Lyons

Sailing Yacht Research Foundation (USA)

Advisory Member	David Lyons

Indo-Pacific IMC2027 Organising Committee

Chair	Stuart Cannon
Members:	Adrian Broadbent
	Brett Morris

Indo-Pacific IMC2027 Program Committee

Chair	Adrian Broadbent
Members:	Craig Boulton
	Geoffrey Fawcett
	Rob Gehling
	G Macfarlane
	Tauhid Rahman
	Warren Smith
	Karl Slater

Bob Campbell Prize

Coordinator	Rob Gehling

Volunteer judges eg. from Prog C'tee & WAA Panel

Warship 2026 (Perth) Organising Committee

Members:	Stuart Cannon
	Eric Fusil
	Andrew Harris
	Warren Smith
	Tim Speer
	Mal Waugh

RINA - EA Joint Board for Naval Architecture

Members:	Jim Black
	Sammar Abbas

The Australian Naval Architect

Editor-in- Chief	Rob Gehling (ag)
Editor	Trev Ruting
Assistant Editors:	Martin Grimm
	Jennifer Knox
	Jack McLaren
Referee	Noel Riley

Section Committee - Australian Capital Territory

Chair	James Loram
Deputy Chair	David Lyons
Secretary	Greg Swalwell
Treasurer	Lauchlan Clarke
Assistant Secretary	Jordan Rayson
Division Council Rep	Xavier Ling
Members:	Ray Duggan
	Peter Hayes
	Jeremy Nolan

Section Committee - New South Wales

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Tech Meeting Coordinator	Ehsan Khaled
Treasurer	A Broadbent
Secretary	Michael Sokialis
Division Council Rep	Adrian Broadbent
Members:	Peter Blackwood
	Craig Boulton
	Robert Bryce
	Pat Doherty
	Lauren Kurts
	Adam Williams

Section Committee - Queensland

Chair	Hamish Lyons
Deputy Chair	Trevor Leacy
Secretary	Trevor Leacy
Treasurer	James Stephen
Division Council Rep	Nicholas Bentley
Members:	Gerard Anton
	Mark Deveraux
	Tommy Ericson
	J Rafieshahraki
	Daniel King
	Tom Ryan

Section Committee - SA-NT

Chair	Vacant
Secretary	A Harris(ag)
Treasurer	Donal Gallagher
Division Council Rep	Vacant
Members:	John French
	Alec Rusanov
	Alastair Mitchell
	Freida Ley
	Steven Holland
	David Whittaker

Section Committee - Tasmania

Chair	Richard Boult
Deputy Chair	G Macfarlane
Secretary	Martin Renilson
Treasurer	Chris Davies
Division Council Rep	Richard Boult
Student Rep	James Curr
Publicity Officer	N Rajapaksha

Section Committee - Victoria

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FROM THE ARCHIVES

Rivercat Construction at NQEA during 1991-92

With the retirement of Dawn Fraser, the last Rivercat ferry to be operated along the Parramatta River in March this year, we include a pictorial review of the construction of the first pair at NQEA Australia Pty Ltd. This has been adapted from an article originally published in Ferries Australia (Australian Ferry Society Inc) of August 2022 at the time marking 30 years of Rivercat service.

In June 1991, the NSW State Transit Authority placed an order with NQEA Australia to build the first two Rivercat low-wash catamaran ferries as part of the Sydney Ferries division plan to resurrect a ferry service on the 22 km route between Circular Quay and Paramatta. These craft, NQEA yard numbers 180 and 181, were to be named *Dawn Fraser* and *Betty Cuthbert*. At the time, the State Transit Authority was considering the acquisition of seven Rivercats with a total contract value anticipated to be up to A$20 million.

The project had already been initiated in 1988 and design work for the catamarans had been undertaken by Grahame Parker Designs Pty Ltd in Sydney. However even prior to settling on a catamaran design, the best layout to achieve low wash had been the subject of wave wake assessments undertaken between the STA, Grahame Parker Designs, the University of New South Wales (computational wave wake analysis) and the Australian Maritime College (model tank testing). Wave wake was required to remain below 300mm crest to trough for the route up to Meadowbank and only 200mm for the remainder of the route to Paramatta. A required service speed of 21 knots was determined on the basis that the Rivercats should provide trip times equivalent to or better than those of rail and bus services from Meadowbank to the city. This was of the order of 30 minutes. To achieve this combined requirement, the study not only considered catamaran options, but also tri-hull vessels with six catamaran and 8 trimaran configurations tested at the Australian Maritime College towing tank. The length of the craft was constrained by consideration of manoeuvring and manning regulations, overall beam was constrained by berthing facilities while even air draft was constrained to 5.7m or less due to road and rail bridges and pipe crossings on the river. The ferry was designed specifically for operation in sheltered waters, thus freeboard to the main deck was kept to a practical minimum. The final design adopted exceptionally slender demihulls of about a metre beam but with a 35m waterline (later extended to 35.7m). The design was to comply with the then Uniform Shipping Laws (USL) Code. Passenger seating capacity was 150 intenally and 22 externally on bench seating forward of the superstructure. Additional passangers could be accommodated standing. It was originally envisaged that the aft open deck would have seating for 8 passengers with standing room for a further 20, however in service the aft deck wasn't finally accessible to the public. Total permitted passenger capacity is 280 from a stability perspective, though normal maximum capacity is 230 passengers.

Winning the contract for the Rivercat construction was welcome by NQEA since orders for new vessels had been lacking following completion of construction of the three Jetcat catamarans for the STA, which were delivered between March 1990 and March 1991. The only other vessel built by NQEA in that time had been a Wave Piercing Catamaran delivered in July 1990.

Betty Cuthbert and *Dawn Fraser* on trials in Trinity Inlet, Cairns, February 1992 (Photo courtesy Mark Fry, NQEA)

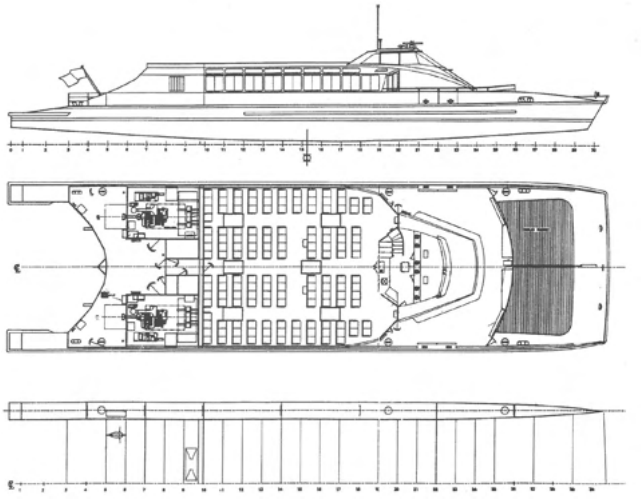
Following the delivery of *Dawn Fraser* and *Betty Cuthbert* to Sydney in February 1992 as above-deck cargo on a ship, and their successful operation on the Paramatta River, an order for a further four of the catamarans was placed with NQEA by the STA in 1992. *Shane Gould* and *Marlene Mathews* (Yard No's 184 & 185) were delivered in January 1993 followed by *Evonne Goolagong* and *Marjorie Jackson* (Yard No's 186 & 187) delivered in September 1993.

The STA later ordered a seventh Rivercat, originally named *Nicole Stevenson* (later renamed *Nicole Livingstone*) however in that case the order was won by WaveMaster International located at Henderson in Western Australia. This final Rivercat, Yard No 130, was delivered in August 1995.

From experience gained from building the Rivercats, NQEA went on to develop an in-house design of sheltered water low wash catamarans under the title of "River Runner". A range of different passenger capacity craft were built by NQEA for export markets around the world.

Over the 33 years of operation of the Rivercats, they have been repowered a number of times. Initially, all seven were equipped with Detroit Diesel GM 8V92TA turbocharged and aftercooled propulsion diesels with power variously reported in the range of 335 to 373 kW each at 2100 RPM. Morse controls were fitted on the first two with subsequent boats fitted with Detroit Diesel Electronic Control (DDEC) systems. From about 1998 the propulsion engines on many, and possibly the entire fleet, were replaced with Caterpillar 3406E SCAC (separate circuit after-cooled) 6 cylinder turbocharged electronic direct injection diesel engines developing 354 kW at 2100 RPM. Between about 2006 and 2009, as part of a further Lifetime Extension Program, MTU Series 60 turbocharged and aftercooled electronic direct injection diesel engines of the same power and RPM have been fitted to *Dawn Fraser*, *Betty Cuthbert* and *Marjorie Jackson*. This engine series had originally been developed by Detroit Diesel in 1987 before that company was merged into MTU. The other four have apparently retained their Caterpillar engines.

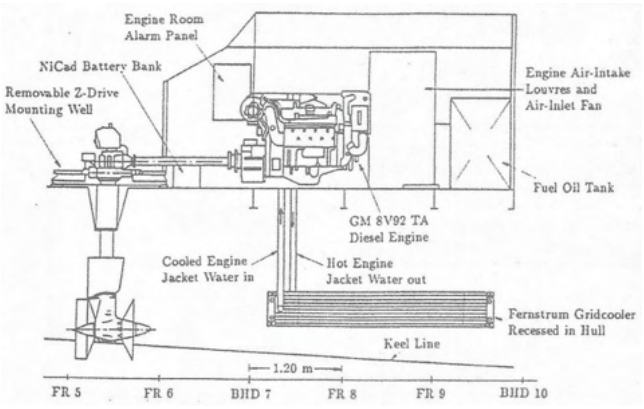
Thanks to Mark Fry from NQEA and Grahame Parker for clarification of technical details, permitting sharing of construction photos and supplying additional information.



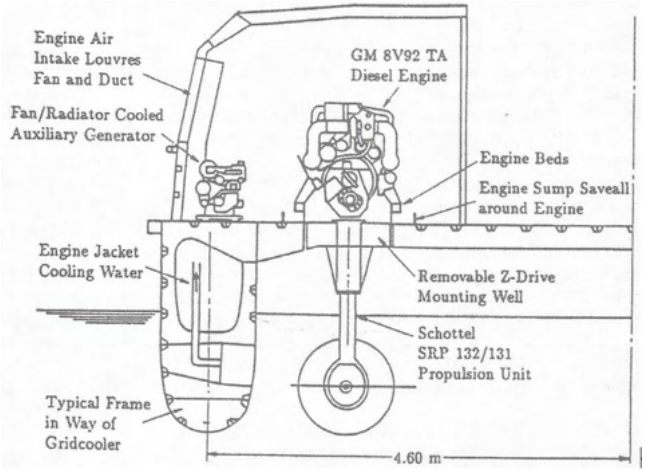
General Arrangement Drawing of the original NQEA built Rivercats, adapted from Ref 2.

Specifications for the Rivercats, as originally built, are:

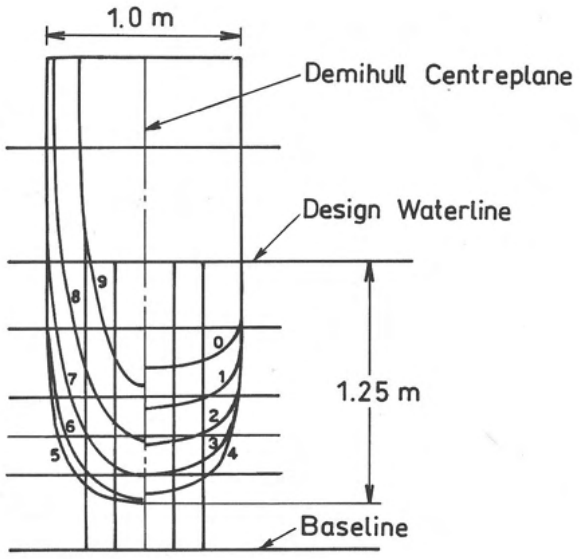
Length Overall:	37.0m
Length Waterline:	35.7m
Beam Overall:	10.5m
Demihull beam:	~1.0m
Demihull spacing:	9.2m
Maximum Draft:	1.35m
Lightship Displ.:	~42 tonnes
Deadweight:	~16 tonnes
Full Load Displ.:	~58 tonnes
Service Speed:	22 knots
Maximum Speed:	21 knots laiden, 23 knots unladen.
Crew:	2-3
Passenger Capacity:	Total 230 incl. standing
Range:	660 Nautical Miles (30 hours @ 22 knots)
Propulsion Engines:	2x Detroit Diesel GM 8V92TA turbocharged & aftercooled each 335-373kW @ 2100RPM
Fuel Consumption:	~179 litres/hr @ 100% MCR (for propulsion)
Clutches:	Twin Disc HL25
Propulsion Units:	2x Schottel SRP 132/131
Generators:	2x 27 kVA radiator cooled Perkins D3152.4
Classification:	DNV +1A1 LC Passenger R5
Survey:	NSW MSB Class 1E
Construction Material:	Marine Grade Al Alloys, GRP sandwich cabin top.
Fuel Capacity:	5500 litres (2x free-standing)
Fresh Water Capacity:	600 litres
Lub Oil Capacity:	100 litres
Climate Control:	AC plant for wheelhouse, vent fans and heaters for cabin.



Side elevation of machinery layout, from Ref 1.



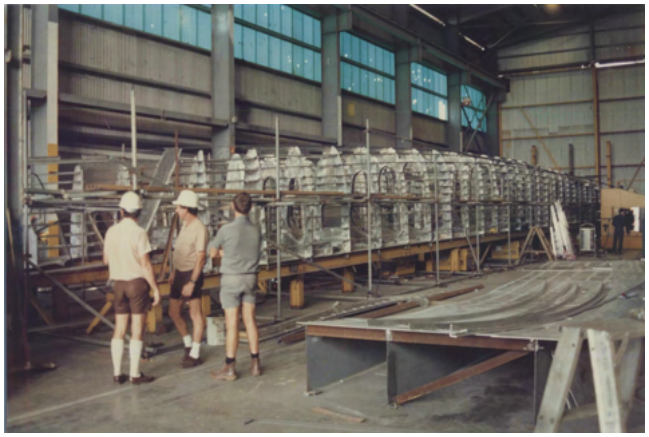
End elevation of machinery layout, from Ref 1.



Bodyplan of the demihulls from Ref 1. Forward sections shown to left aft sections to right.

The photos that follow, generally in chronological order, were taken by Martin Grimm while on an industry placement and show various stages of construction of the first pair of Rivercats at the NQEA yard in Cairns.

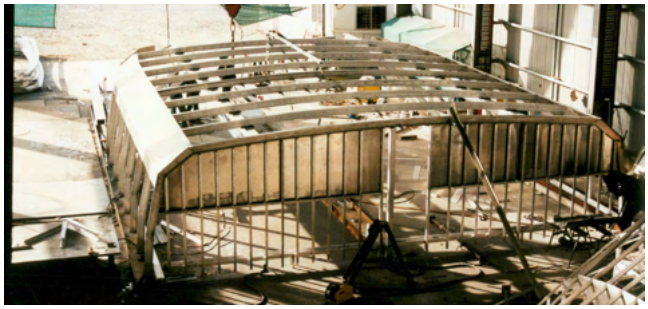
The first pair of frames are stood up on portions of the inverted deck plating which in turn are placed on steel jigs used to support the construction of the demihulls. In order to achieve a low wave wake, the demihulls were just over a metre wide, so too narrow to fit engines. The hulls are therefore mostly empty aside from some minor tanks such as fresh water and sullage. Even the fuel tanks were not located in the hull, but are free-standing in engine rooms. Demihulls of *Dawn Fraser* are in the outer two jigs. The first demihull of *Betty Cuthbert*, being the starboard side, was assembled on the central jig.



On the shop floor left to right: Gary Mears, Leigh McGrath and John "Swampy" Greven of NQEA discussing progress. Construction of one of the bow cross structures is visible on the jig in the foreground.

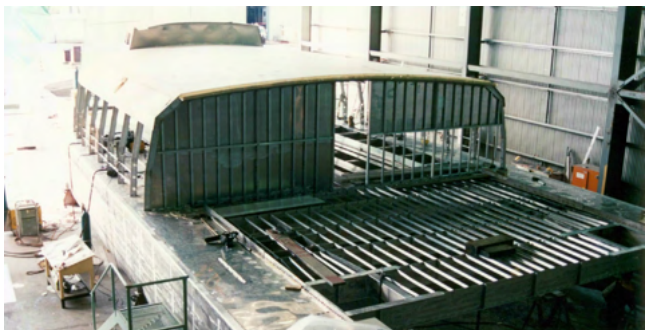
Assembly of the forward cross structure of *Dawn Fraser*. A jig is used to ensure the correct curvature of the structure with the deck plating facing downward.

Forward end of superstructuture of *Betty Cuthbert* including the wheelhouse taking its characteristic form with plating applied around the wheelhouse windows. This plating is later trimmed to suit the frames of the custom designed windows. In keeping with the light weight design, much of the superstructure plating is 2.5mm thick.



The passenger cabin of *Dawn Fraser* being assembled. The bulkhead nearest the camera is the aft end of the cabin. There are a pair of closely spaced bulkheads in this location, the other being the forward bulkhead of the engine rooms. The intention of this double bulkhead arrangement being to insulate the cabin from the noise and vibration of the diesel engines, which proved to be effective.

The 'roof' of the passenger cabin was a GRP sandwich construction. It is seen here being 'vacuum bagged' on its plywood and timber jig used to ensure it had the correct curvature. This work had been subcontracted. The alloy passenger cabin structure is seen behind it.



Forward portion of superstructure with wheelhouse and passenger cabin in place. The square openings at the aft end of the cross structure are to accommodate the Schottel propulsor units.

Grahame Parker was adament that NQEA needed to monitor the weight of the craft during construction. His comprehensive weight list was further refined as design details were finalised by NQEA and components were weighed on arrival from suppliers. Ongoing weight monitoring indicated that the longitudinal centre of gravity was drifting aft, in part due to heavier than expected machinery. It was decided to fit 700mm extensions to the rear of the demihulls to maintain a more

level trim. The extensions would also have aided in maintaining the desired low wave wake of the catamarans. The extensions are being installed on *Dawn Fraser* in this photo.

Cabin transformed from a bare aluminium alloy structure to a complete interior during a run out of Trinity Inlet for NQEA staff and their families in February '92. The designer of the Rivercats, Grahame Parker is in the centre of the photo facing camera at a window seat with Paul Harrison from NQEA alongside him.

Dawn Fraser towed from the building hall to the slipway at NQEA on 16 January '92. Bob Ruddell from NQEA directing the transfer near the bow of the catamaran. The catamaran is supported at only two longitudinal positions as it is repositioned prior to launch.

Dawn Fraser entering the water for the first time at NQEA on 17 January '92. *Betty Cuthbert* was launched on 7 February '92.

Betty Cuthbert loaded astern of *Dawn Fraser* for delivery to Sydney. The ship got underway in the early hours of 15 February 1992. After a period of trials, evaluation and crew training in Sydney, the Rivercats became operational on the Meadowbank route that May.

The minimal wake astern at cruising speed on the Paramatta river. A fair portion of the 'white water' is generated by the Schottel drives inboard of the hulls rather than from the transom sterns.

The sole WaveMaster built Rivercat, *Nicole Livingstone* at reduced speed about to pass under the Gasworks Bridge at the upper reaches of the Paramatta River run. (Courtesy Flickr contributor 'Tim')

References and further reading:

[1] Hornsby, N.; Parker, G.; Doctors, L.J.; Renilson, M.R., "The design, development and construction of a 35m low-wash fast catamaran river ferry", IMAS 91 High Speed Marine Transportation, 11-13 Nov 1991.

[2] Phillips, S.J. (ed), Jane's High-Speed Marine Transportation 1997-98.

[3] Hornsby, N.; Parker, G., "The Rivercat Low Wash River Ferry", Maritime Technology 21st Century Conference Melbourne 1992.

[4] Doctors, L.J.; Renilson, M.R., Parker, G.; Hornsby, N.; "Waves and Wave Resistance of a High-Speed River Catamaran", First International Conference on Fast Sea Transportation, Trondheim, Norway, 1991.

[5] Doctors, L.J.; "Recent Studies of the Hydrodynamics of River Vessels", The Australian Naval Architect, May 2019.

[6] Doctors, L.J.; "The Hydrodynamics of the Sydney Harbour RiverCat Ferries", RINA NSW Section & IMarEST ACT & NSW Branch online technical presentation, 7 July 2021.

[Are the new Frances Bodkin class subject to the same wash wave criteria as the Rivercats? - Ed]

China Zorrilla safely aboard Black Marlin for delivery voyage to South America
(Photo courtesy Incat Tasmania)