

THE AUSTRALIAN NAVAL ARCHITECT



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February 2021



Australia's recently-completed icebreaker, RSV *Nuyina*, during sea trials in the North Sea in December 2020
(Photo by Flying Fish, courtesy Australian Antarctic Division)

THE AUSTRALIAN NAVAL ARCHITECT

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Cover Photo:

Built by Incat Tasmania for the government of Trinidad and Tobago's National Infrastructure Development Company, the 100 m catamaran *Buccoo Reef* on sea trials off Hobart (Photo courtesy Incat Tasmania)

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RINA Australian Division

on the
World Wide Web

www.rina.org.uk/aust

From the Division President

Happy New Year to all our members and welcome to the February edition of *The Australian Naval Architect*. Our new RINA Chief Executive, Chris Boyd, chaired his first RINA Council meeting on 19 January and we all wish him well in his new role. Chris has a background in the Royal Navy, Ministry of Defence UK and the offshore industry prior to taking up his new position.

With the start of the new year, I thought that it would be a good opportunity to take a quick look across the maritime environment to establish some context for 2021.

There has been considerable activity in the maritime Defence sector over the past three months, both in Australia and the wider Asian region. On 2 October 2020, NUSHIP *Supply* arrived at Fleet Base West, WA, for final fitting out and testing activities. *Supply* subsequently sailed to Fleet Base East, NSW, where ship acceptance occurred on 8 January 2021. The second ship of the class, NUSHIP *Stalwart*, is completing fitting out in Ferrol, Spain.

The Hunter-class frigate project continues apace with the System Design Review scheduled for this year prior to commencing the Preliminary Design phase. On the construction front, a major milestone was achieved in December with the official start of the prototyping phase, during which BAE Systems Australia will build five prototype blocks to test the new production facilities and systems in Osborne, SA.

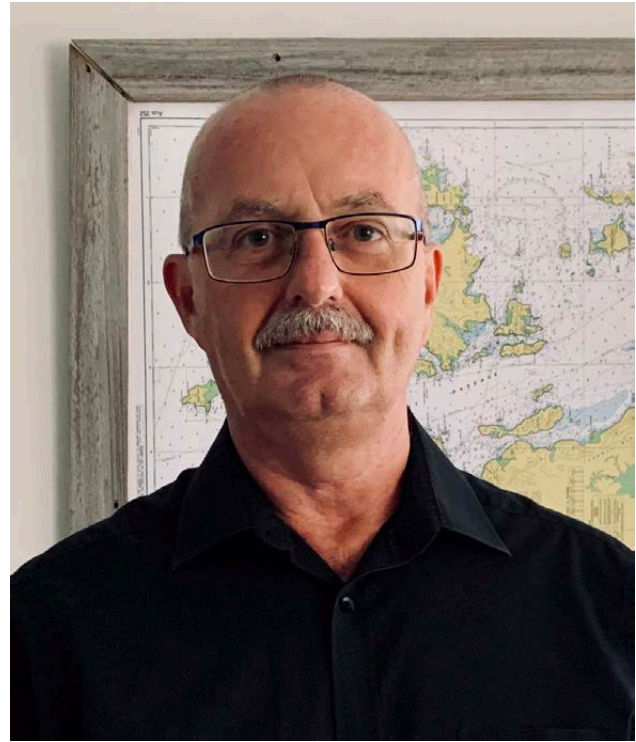
During the same period, Luerssen Australia and Cvmec have commenced construction of the fourth of 12 Arafura-class offshore patrol vessels (OPVs) at Henderson, WA, while the first two OPVs are currently under construction by ASC in Osborne.

The Australian Government has also recently announced the investment of \$1 billion to commence the early development of advanced guided weapons, including long-range anti-ship and land-attack cruise missiles, to enhance Australia's maritime security.

Unfortunately, the Attack-class submarine project continues to be the subject of negative sentiment in the press with claims of schedule delays and a steep rise in the cost of the project. The importance of this project to Australia is apparent when we consider that, by 2030, it is estimated that there will be about 300 submarines from around the world operating in the Indo-Pacific region, with the Chinese submarine force alone having in excess of 60 submarines, and the Indian Navy will soon commission its second nuclear-powered ballistic-missile submarine INS *Arighat*.

The Chinese navy commissioned PLA-NS *Nanchang*, the first of the Type 055-class stealth guided-missile destroyers on 12 January in Qingdao, PRC. The 10 000 t, 180 m long, 20 m beam warship's arsenal includes 112 vertical-launch missile cells capable of launching a combination of surface-to-air missiles, anti-ship missiles, land-attack missiles and anti-submarine missiles. The Type 055 class is expected to accompany aircraft carriers in battle groups, and a major Shanghai shipyard is being significantly expanded amid news that work has begun there on China's fourth aircraft carrier.

The Australian Naval Architect



Gordon MacDonald

The main focus in the commercial shipping world shaping the future and driving technology is the IMO focus on reducing emissions of greenhouse gases (GHG) from international shipping, under IMO's marine pollution prevention treaty, MARPOL. A recent Working Group on Reduction of GHG Emissions from Ships considered draft mandatory measures to cut the carbon intensity of ships, building on current mandatory energy-efficiency requirements to further reduce greenhouse gas emissions from shipping, with a strategy to reduce CO₂ emissions by at least 40% by 2030, and a long-term objective of reducing by at least 50% by 2050 compared to 2008. In response, the industry is considering options such as the use of LNG, ammonia, hydrogen or bio-fuels, and the use of large lithium batteries when in port. The 180 000 t bulk carrier *HL Green* became the first LNG-fuelled vessel to berth at Port Hedland, WA, in January. Unfortunately, the uncertainty regarding which technology to adopt has resulted in shipowners reducing the number of new vessels on order. With the life of a commercial ship averaging around 20 years, opting for a technology that doesn't take off could be very costly.

I remind members that I seek your assistance in providing your ideas of how we can improve the services of the Institution, thereby making it more relevant to your needs. Please email your thoughts directly to me at <gdmacdonald@gmail.com>.

Gordon MacDonald



Editorial

It is always pleasing to read of the progress being made with Australia's major naval shipbuilding projects. Of course, the largest projects, the Hunter-class frigates and the Attack-class submarines are in the early stages and much of the work being undertaken is behind the scenes — design, facilities preparation, personnel recruitment and training. Unfortunately, much of this work is invisible to the general public. Many people, who see commentary on the cost and the apparently (to the commentators) interminable timescale of these projects, cannot understand why it takes so long to acquire new frigates and new submarines. Inevitably, this results in further commentary suggesting that all is not well and a different course should have been taken. This is frustrating for the participants and challenging, I suspect, for our politicians to resist pressures to make something happen which is visible to the public eye.

The often ill-informed comments I see from time to time, and the questions I get asked by interested observers, like 'Why is it taking so long?', remind me of projects long past. In particular, I am reminded of a project, eons ago, to build two frigates to replace the lost destroyer HMAS *Voyager*. The government ordered two additional Type 12 anti-submarine frigates generally similar to the recently-completed HMA Ships *Stuart* and *Derwent*. The urgency of the project was such that the steel for the ships and much long-lead time material was ordered within a week of the order for the ships, one to be built in Sydney and one at Williamstown in Melbourne. Delivery was expected in four years.

That was all fine except that, within about six months, the

design of the ships was substantially changed — for the better I should add. That put considerable pressure on the drawing offices in the shipyards and Navy Office to muster sufficient people to tackle the preparation of new design detail and working drawings.

Despite this change of direction, political pressure for visible progress was considerable, and steel was hurriedly prepared for a keel-laying of both ships, at least a year too soon. It took six years of effort to complete the two ships whilst they were still being designed. Nevertheless the two ships, which became HMAS *Swan* and HMAS *Torrens*, were fine ships and served the RAN well.

Unfortunately, the reasons for a 50% increase in the construction time, and the considerable increase in cost were not well understood outside the circle of those actually involved, and HMAS *Torrens* was to be the last combat ship completed in an Australian shipyard for 22 years.

There were many lessons to be learned from that project, not least the wisdom of completing design and preparation work before starting production. Today, the work on our new naval construction projects is concentrating on design, facilities preparation, recruitment and training — as it should. It is essential, in my view, that these phases of the projects be thoroughly completed as planned. It will pay off handsomely in the end.

Meanwhile, non-participants will continue to ask 'Why is it taking so long?' The challenges which lie ahead include those of getting the message across that things are actually happening, and to resist inevitable pressure to cut corners.

John Jeremy



No; it was not a race! The Flagship of the 185th Australia Day Regatta, HMAS *Diamantina*, about to round Bradleys Head inbound on 26 January. The Regatta, which has been held every year since 1837, was sailed on Sydney Harbour, offshore and on other waterways of NSW with some 600 boats taking part, 70 in the Sydney Harbour event

(Photo John Jeremy)

COMING EVENTS

Australian Division AGM

The Annual General Meeting of the Australian Division of RINA will be held by video-conference using RINA's Zoom platform on Wednesday 17 March at 6:30 pm AEDT; see details in separate notice in this issue of *The ANA*.

NSW Section AGM

The Annual General Meeting of the NSW Section of RINA will be held by video-conference on Wednesday 3 March immediately following the scheduled technical presentation webinar of RINA (NSW Section) and IMarEST (ACT&NSW Branch) at 6:00 for 6:30 pm AEDT. Registration is required as for the technical presentation. The formal notice, agenda and reports will be emailed to members prior to the meeting.

NSW Section Technical Presentations

Technical presentations during COVID-19 restrictions will continue as webinars, generally hosted by Engineers Australia. Registration for each presentation is required, and details will be provided in the flyer for each meeting.

The COVID-19 situation is fluid, and when restrictions will be lifted is not known. However, it is expected that technical presentations will continue as webinars for all of 2021, and consideration will be given to a return to face-to-face meetings in 2022.

The program of meetings for 2021 (with exceptions noted) is as follows:

- 24 Feb Asif Ghauri, National Manager — Marine and Diesel, Alfa Laval Australia
Ballast Water Treatment: Challenges, Solutions and Operations
- 3 Mar Eric Desjardins, General Manager Australia, McConaghy Boats
Construction of Advanced Composite Racing Yachts
- 3 Mar NSW Section Annual General Meeting
- 7 Apr Laurie Prandolini Award recipient
Topic TBA
- 5 May Sally Garrett, Defence Technology Agency, New Zealand Defence Force
Characterising the Southern Ocean and Ross Sea Wave Climate
- 2 Jun Ian Moon
Naval Ship Sustainment
- 7 July Lawrence Doctors, Professor Emeritus, UNSW Sydney
Optimisation of Marine Vessels on the Basis of Tests on Model Series
- 4 Aug Piermatteo Nissotti, General Manager Marine, Eptec Group
Application of Intership 6GV to a Royal Australian Navy Flight Deck
- 1 Sep Chris Skinner, Editor *Nuclear Propulsion Roadmap for Australia*
Nuclear Maritime Propulsion Roadmap for Australia

- 6 Oct Warren Smith, Associate Professor, Ahmed Swidan, Senior Lecturer, and David Lyons, Lecturer, UNSW Canberra
The New Naval Architecture Degree Program at UNSW Canberra
(Joint meeting with ACT Section)

- 2 Dec SMIX Bash 2021

ACT Section Technical Presentations

Technical presentations in 2021 will continue as webinars for the foreseeable future, generally hosted by RINA using the Zoom platform and starting at 6:30 pm (local time). Registration for each presentation is required, and details will be provided in the flyer for each meeting.

The program of meetings arranged so far for 2021 is as follows:

- 27 Apr John Kecsmar, Principal, Ad Hoc Marine Designs
The Structural Design and Fabrication of Aluminium High-speed Vessels — the Good, the Bad and the Ugly
- 6 Oct Warren Smith, Associate Professor, Ahmed Swidan, Senior Lecturer, and David Lyons, Lecturer, UNSW Canberra
The New Naval Architecture Degree Program at UNSW Canberra
(Joint meeting with NSW Section)

SA&NT Section Technical Presentations

Technical presentations early in 2021 will be held as face-to-face meetings at the University of Adelaide, starting at 6:00 pm (local time).

The intention is to subsequently move to hybrid (i.e. face-to-face and streamed live) meetings.

The program of meetings for 2021 (with exceptions noted) is as follows:

- 24 Feb LEUT James Heydon RAN, Marine Engineering Officer Submarines
The Naval Architect: A Uniformed Perspective
- TBA Mar Peter Christopher, City of Adelaide Preservation Trust
City of Adelaide Clipper Ship Historical Engineering
(On board *City of Adelaide*, Dock 2, Port Adelaide, and includes ship tour)

America's Cup 2021

The 36th America's Cup match will be held in Auckland, New Zealand, from 6 to 21 March 2021 and will see the defender, *Emirates Team New Zealand*, racing against the winner of the Prada Cup for the Challenger Selection Series, with the challenger being the first team to score seven points.

The racing schedule for the America's Cup match has two races per day planned for March 6, 7, 10, 12, 13, 14 and 15. Additional reserve days have been scheduled, but the intention is to complete the event on the weekend of March 13–14, weather permitting. The winner of the America's Cup will be the first team to score seven points.



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HPYD7

HPYD is the series of conferences on high-performance yacht design organised by the Royal Institution of Naval Architects NZ and the University of Auckland. The first conference was held in December 2002. Since then, the conferences have showcased the latest developments in yacht research from around the globe. The conference enables naval architects, engineers, designers and researchers to present and hear papers on the current state of high-performance yacht and power craft technology.

Planning for HPYD7 is under way and the event will coincide with the America's Cup in Auckland in 2021, returning to the traditional format with a full complement of papers and speakers. The call for papers was circulated and submission of abstracts closed on 1 August 2020.

Due to COVID-19 restrictions, the conference will have both a physical and an online presence, timed to suit European time zones. The technical sessions will be recorded and be available online.

The provisional schedule for HPYD7 is as follows:

Thursday 11 March

0700–1200	Technical presentations
1700–1830	Local industry presentations
1930–2100	Public session

Friday 12 March

0700–1200	Technical presentations
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You can follow HPYD on Facebook or LinkedIn, or sign up on the conference website for their mailing list to receive the latest news.

See www.hpyd.org.nz for more details or, for general information, email info@hpyd.org.nz; or for sponsorship opportunities, email sponsorship@hpyd.org.nz.

AOG Energy 2021

The Australasian Oil & Gas Exhibition & Conference is set to return to Perth in 2021 renamed as AOG Energy, re-energised and celebrating 40 years with a two-day event, showcasing local capabilities and exploring future opportunities. The annual exhibition and conference is the largest oil-and-gas event in Australia, featuring over 300 exhibiting brands and over 8700 global visitors.

The Conference features three Forums dedicated to Industry Supply, Subsea, and Knowledge, all housed on the show floor and focusing on the opportunities and challenges in times of transformational change.

AOG Energy 2021 is scheduled for 10–11 March 2021 at the Perth Convention and Exhibition Centre.

Further details can be found on the AOG Energy website <https://aogexpo.com.au/>.

FAST 2021 Call for Papers

FAST (International Conference on Fast Sea Transportation) is the premier global conference for high-performance ships and craft and is of great interest to all who are engaged in researching, designing, building, and operating them. The objective of FAST 2021 is to bring together experts from around the world to present/exchange knowledge and network around the most comprehensive and latest information available on high-performance vessels and their technology.

FAST 2021 will be held on 25–26 October 2021 in Providence, Rhode Island, USA. At this time and based on the current outlook for returning to live events post COVID-19, FAST is being planned as an in-person, face-to-face event. Contingency plans are being made in the event we do not see the expected recovery and have to pivot to a virtual conference at a later date.

You are invited and encouraged to propose a paper for the FAST conference by submitting an abstract of 200 to 400 words to FASTconference@sname.org by 15 March 2021.

Important Dates:

- 15 Mar Deadline for abstracts
- 15 Apr Authors notified of acceptance of abstracts
- 15 Jul First drafts due
- 15 Aug Reviews due back to authors
- 15 Sep Final papers due

An advanced ship or craft is one offering capabilities well beyond what is achievable by conventional designs, which generally means significantly higher speed or significantly enhanced ability to operate in high waves. These higher levels of capability can be gained in a broad range of configurations: planing craft, fast multi-hull designs, hydrofoils, SWATH (small waterplane area twin hull) ships, WIG (wing-in-ground-effect) craft, air cushion vehicles/hovercraft, surface-effect ships and seaplanes — as well as hybrids of these and novel concepts not yet even envisioned. These tend to be relatively small, but a large ship which attains high speed or enhanced seakeeping, possibly by means of an unconventional hullform or appendages, is also included. Even in the smallest sizes, craft for personal and leisure use often break new ground, and they can also grow large over time.

Some topics of interest for the conference include, but are not limited to:

- Novel configurations and concepts
- Advances in foil-supported craft
- Hullforms and hydrodynamics
- Propulsion systems
- Application of electric propulsion to fast craft
- Motions and manoeuvring, control systems and devices
- Operational uses of fast ships and craft
- Considerations for the development of the wind-farm vessel fleet for service in the United States
- Structural design, materials and construction
- Design processes and tools
- Application of artificial intelligence to the design of fast craft
- Modelling, simulation and analysis
- Advanced computational techniques for resistance and seakeeping prediction
- Autonomous systems and operations
- Advances in navigational autonomy
- Self-adaptive health monitoring for unmanned systems
- Environmental effects and mitigation
- IMO Tier 3 and its impact on fast craft design
- Alternative fuels and power sources

- Economics and the value of speed
- Risk, safety and survivability
- Classification and regulation

Indo-Pacific 2022

AMDA Foundation has provided an update for the Pacific International Maritime Exposition which was to be held in August 2021, with that show now planned for May 2022 due to the fallout from the COVID-19 pandemic and renamed the Indo-Pacific International Maritime Exposition instead.

In its news release announcing the change, organiser AMDA Foundation noted that “the Indo-Pacific has become increasingly central to world commerce, international stability and security. The Indian and Pacific Oceans include the world’s busiest trade corridors, driving commercial and geopolitical connections which embrace much of the globe.

“Key Australian and international stakeholders, as well as the world’s naval defence and commercial maritime industries, are increasingly focused on the Indo-Pacific. It is, therefore, appropriate that the name of the event, which provides a platform for discussion in the national interest among those key groups and is an essential engagement and promotional opportunity for industry, should reflect that focus.”

The inaugural Indo-Pacific exposition will also be held in Sydney, with precise dates to be announced shortly. AMDA says that once the world has transitioned past the aftermath of the pandemic, it intends that its expositions will resume their normal biennial cycle, with Indo-Pacific returning to its regular timing in the latter half of odd-numbered years i.e. during the second half 2023.



NEWS FROM THE SECTIONS

ACT

Spirit of Australia 2 and the World Water Speed Record

Dave Warby and Phil Frawley of the Warby Motorsport Team gave a presentation on *Spirit of Australia 2 and the World Water Speed Record* as a webinar using RINA's Zoom software platform with the Chair of the ACT Section, Warren Smith, as MC on 1 December 2020. This presentation attracted 20 participating on the evening, including the new Chief Executive of RINA, Chris Boyd, from London, UK.

On 8 October 1978, 42 years ago, Ken Warby blasted across Blowering Dam to set his second (and current) world water speed record of 317.6 mph (511.1 km/h), thus becoming the first person to officially break the 300 mph and 500 km/h barriers, the only person to ever design, build and drive a boat to a World Water Speed Record, and still the only person in the world to hold these records.

Dave Warby and the Warby Motorsport team have designed and built a new vessel, and Dave is attempting to break his father Ken's record in *Spirit of Australia* in their latest vessel, *Spirit of Australia 2*. Initial trials were carried out on the Manning River at Taree, NSW, with subsequent trials at Blowering Dam, NSW, and speeds gradually increased to 250 mph (402 km/h).

The new horizontal stabiliser for the vessel has been fitted and the first trials with it on the vessel were carried out on Blowering Dam on the weekend of 7–8 November 2020, but were hampered by cross winds on both days.

Dave and Phil gave an update on the design and performance of *Spirit of Australia 2* so far, and their progress as they push the speed gradually higher towards a new world water speed record. They were able also forthcoming in discussing characteristics of the boat which they needed to further test and analyse.

Question time was lengthy and elicited many more interesting points.

The “thank you” bottle of wine has subsequently been delivered via an eGift card.

Dave and Phil's presentation was not recorded.

Phil Helmore

Design for the Mind

Joakim Trygg Mansson, Manager, Compliance and Planning/Duty Harbour Master, Port Authority of New South Wales gave a presentation on *Design for the Mind* as a webinar using RINA's Zoom software platform with the Chair of the ACT Section, Warren Smith, as MC on 8 December 2020. This presentation attracted 15 participating on the evening.

Joakim Trygg Mansson has been a master mariner, VTS (vessel traffic services) operator with the Swedish Maritime Authority, and port control officer and senior adviser with the Australian Maritime Safety Authority. He completed his PhD on *Maritime Human Factors* at the Australian Maritime College in 2018. He is now the Manager Compliance and Planning/Duty Harbour Master with the Port Authority of New South Wales in Sydney.

Joakim began his presentation with a definition of Ergonomics and Human Factors, saying that “Ergonomics” is the European term, where others use “Human Factors”, but they are widely considered to be the same thing for the purposes of design.

Human Factors/Ergonomics (HF/E) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system and the profession which applies theory, principles, data and methods to design in order to optimise human well-being and overall system performance.

Joakim then went on to provide an introduction to the three different domains (ergonomic, cognitive and organisational) of HF/E, and then discussed some selected principles for designing and managing a socio-technical system — with a particular focus on cognitive and organisational ergonomics. He explained that human factors have to be considered within the lens of a socio-technical system; e.g. a technical system such as an LHD has to exist within a society (in which emergencies occur) and a political environment.

Joakim presented some design principles he has found to be prevalent, but rarely discussed, which we should all consider:

- *Work as imagined* vs *Work as done* — Humans don't always do things the way you would imagine; we are variable.
- *Efficiency* vs *Thoroughness* — resources are always limited and we must make trade-offs.
- *Technical* vs *Social Redundancy* — In social redundancy, more bystanders means that we are more likely to stand by. However, in technical redundancy, more systems increase reliability. A concern Joakim raised, based on experience, is that humans are unlikely to override a technical system, even if they believe it to be in error.

A discussion of applications of these three principles followed, with a number of audience members discussing the applications and experience with the principles in their lines of work — we could all identify situations within these three principles in our own day-to-day work.

Question time was lengthy, and elicited some further interesting points. The “thank you” bottle of wine has subsequently been delivered via an eGift card.

Joakim's presentation was recorded, and is now available on the RINA YouTube channel (see *The Internet* column).

Lily Webster

New South Wales

SMIX Bash

The 21st SMIX (Sydney Marine Industry Christmas) Bash was to have been held on Thursday 3 December aboard the beautifully-restored *James Craig* alongside Wharf 7, Darling Harbour, from 1730 to 2130.

However, due to COVID-19 restrictions, the Sydney Heritage Fleet had stopped the use of *James Craig* as a venue and, as a result, SMIX Bash 2020 had to be cancelled; however, we have booked *James Craig* for Thursday 2 December for SMIX Bash 2021.

Committee Meetings

The NSW Section Committee met on 24 November 2020 and, other than routine matters, discussed:

- SMIX Bash 2020: Sponsors have been asked whether they wish to have their sponsorship refunded or rolled over to 2021.
- TM Program 2021: One final presentation scheduled for December 2020; five RINA presentations now scheduled for 2021, with IMarEST presentations to be provided.
- TM Venue 2021: Engineers Australia currently (November 2020) allow 50 people in the expanded Harricks Auditorium in their new premises in the CBD; we therefore expect to have face-to-face presentations which will be streamed live and recorded for the RINA YouTube channel in 2021, although this could change depending on the evolving COVID-19 situation.

The next meeting of the NSW Section Committee is scheduled for Tuesday 16 February.

Are Naval Architects More than Just Designers?

Rob Gehling, Secretary of the Australian Division and Vice President of the Pacific Region of RINA, gave a presentation on *Are Naval Architects More than Just Designers?* as a webinar using RINA's Zoom software platform with the Deputy Chair of the NSW Section, Phil Helmore, as MC on 2 December. This presentation attracted 33 participating on the evening, including the new Chief Executive of RINA, Chris Boyd, from London in the UK.

Introduction

Rob began his presentation by saying that the Chief Executive of the Naval Shipbuilding College, in his presentation to the Pacific 2019 International Maritime Conference, did not include naval architects in the list of vocations to be recruited by the College for implementation of the Naval Shipbuilding Program. When questioned, he claimed that naval architects were actually included as “designers”.

Subsequently, the RINA Council in May 2020 established a Working Group (WG) led by the author to look into *The Roles and Capabilities of Naval Architects*. The recommendations in the report of the Working Group, which are fairly general, were adopted in-principle by RINA Council at its October 2020 meeting, and will be considered further at the next Council meeting in January 2021, particularly with regard to the specific actions to be taken.

As the general subject was initially raised by the President of the Australian Division, and the Working Group was led by the presenter, the report is particularly pertinent for the Australian Division, and does not necessarily apply to all countries or all sections of industry. The President of RINA and the RINA Council will be faced with implementation of the recommendations!

Definitions of Naval Architecture

The WG Report contains a seven-page Annex of various peoples' ideas of appropriate definitions. Among them are the following:

- “Naval architecture is that field of engineering which

addresses how we can apply our acquired wealth of knowledge to conceive of, design, test, build, and operate all types of ships and boats — recreational to naval, small to big, operating on or under the sea, sails to nuclear, etc.” [US Naval Academy, Annapolis].

- “Naval Architecture is the art of modelling materials we do not wholly understand into shapes we cannot precisely analyse so as to withstand forces we cannot properly assess in such a way that the public at large has no reason to suspect the extent of our ignorance.” [Phil Helmore, with apologies to A.R. Dykes from his Chairman's Address to the Scottish Branch of the Institution of Structural Engineers in 1977, who said it about Structural Engineering].

However, for the purposes of the WG Report, the following definition was adopted;

- “Naval Architecture, sometimes referred to as maritime engineering, is the branch of engineering which brings together the results of the practical and scientific experience of all those concerned with the design, construction and operation of ships and marine structures. This work has application to ships, boats and marine structures in the naval, commercial, recreational and offshore industry sectors”.

The WG Report uses the term “naval architect” to include those who identify as maritime engineers under our branch of engineering, rather than simply relating to the shape or layout of a ship or marine structure.

Is Naval Architect the Correct Name?

System Architect would lose the maritime and engineering connection, but references the role in determining the configuration of a ship as the original systems engineer, integrator and architect.

Maritime Engineer may be too close to “Marine Engineer” and its use by our colleagues in IMarEST.

Changing from *Naval Architect* would necessitate a change in the name of the Institution, would lose the Institution's long and prestigious history, may prejudice our incorporation by Royal Charter and our crest, and is well beyond the remit of the Working Group.

So, for the time being, the name *Naval Architect* remains.

How to Represent Ourselves to the World?

For audiences unfamiliar with naval architecture, such as recorded technical presentations with an unknown audience, the Working Group suggested that an alternative logo conveying who we are and what our business is, could be used. For example:



Possible RINA Logo
(Image courtesy RINA Working Group Report)

The Australian Naval Architect

Note that the word “platforms” was deliberately included to cover the offshore industry and those [*non-naval architects!* — Ed.] who see a ship only as a platform for its payload.

Self-identity of a Naval Architect

Are we attracting the right students to naval architecture? Noting that the fundamental skills of a naval architect are in ship design, do naval architects feel constrained from expanding into other areas including environmental protection, project management, production planning, production management, survey and certification, operations and sustainment?

A naval architect should have a good understanding of the total engineering of a ship to enable them to take meaningful roles at all levels in these areas.

A degree in “naval architecture” is not necessarily essential to make a substantial contribution to “the design, construction, maintenance and operation of marine vessels and structures” and so be eligible for RINA Membership.

RINA is not an education provider and should not run courses to enable individuals to operate in these areas, but may direct people towards courses

Roles and Capabilities as seen by Industry

Some industry leaders do not appear to see the naval architect’s role extending beyond design and perhaps research/development.

Industry appears to see little importance in the naval architect’s fundamental skills other than design which apply to shipbuilding processes, e.g. design modifications necessary to produce a “bought-in” design.

The role of the naval architect as the *integrator* of technologies into the ship as a working marine vehicle appears to have been progressively overlooked.

Industry overlooks the naval architect’s broad engineering understanding of the technologies in a ship and its construction which apply directly to project management, production planning and construction as well as design.

Roles and Capabilities as Seen by Employers

The roles and capabilities as seen by Industry also apply. In addition:

Naval architects may be seen as costs which don’t add value. Design work done during a building program for an existing design includes:

- optimising structural components and materials according to the materials and sections available in the country of build;
- adapting arrangements to meet technical or cultural requirements;
- ensuring monitoring of as-built characteristics such as stability and strength; and
- developing and incorporating design improvements in later ships of the series.

Shipbuilders need to recognise the continuum of skills represented by RINA’s range of membership classes including EngTech, IEng and CEng levels, covering detailed design through to senior management.

Roles and Capabilities as Seen by the Public

The public doesn’t necessarily associate the “naval architect” name with engineering ships and marine platforms.

Professional engineers, as against trade-based “engineers” such as motor mechanics and washing machine technicians, may also suffer poor public relations.

Our profession, the Institution and the roles and capabilities of naval architects all need to have their profiles raised.

RINA should interact more with industry and government and participate in industry dialogues on common issues. This may provide more value to RINA members and have an effect in increasing membership.

Topics outside the Working Group’s Terms of Reference

- Education is under the purview of the Professional Review Committee.
- Change from “naval architect” and of the name of the Institution.
- Engage professional branding and PR services.
- Endorsement of courses or publication of a relevant course list.
- Professional certification to practice.
- Information on how to become a naval architect.
- Broadening graduates’ understanding of ship and shipbuilding technologies.
- Student and career mentoring/support.

Recommendations for RINA Council Action

1. The Institution needs to emphasise at every opportunity that its business is as a professional body promoting the proper and full application of knowledge in the science, technology and management of shipbuilding, marine technology and shipping as stated in its Objects.
2. RINA should raise the public profile of our profession and the roles and capabilities of naval architects and maritime engineers.
3. RINA should work with the Engineering Council, EngineeringUK, Engineers Australia and other national peak bodies for engineering to maintain and promote the image/status of not only naval architects but also professional engineers in general as compared with trade-based “engineers”.
4. RINA should work with industry to emphasise the role of the naval architect as the integrator of technologies into the ship as a working marine vehicle and to emphasise that a naval architect’s broad engineering understanding of the technologies integrated into a ship is directly applicable not only to design but also to production planning, ship construction and sustainment
5. The Institution should apply itself to ensuring that industry and those seeking to have ships constructed are aware that a “bought-in” design will inevitably need modifications such as:
 - optimising structural components and materials according to the materials and sections available in the country of build;
 - adapting arrangements to meet technical or cultural requirements;

- ensuring monitoring of as-built characteristics such as stability and strength; and
 - developing and incorporating design improvements in later ships of the series.
6. To change the perceptions of naval architects being seen only as specialists by employers, RINA should:
 - Increase the breadth of its membership through visibility and encouraging joining by those in roles such as environmental protection, project management, production planning, production management, survey/certification, and operations/sustainment.
 - Encourage one- or two-year postgraduate courses in naval architecture to be provided for graduates in other disciplines of engineering.
 - Encourage students of naval architecture and offshore engineering to become Student Members participating in Institution activities.
 - Invite senior managers in major shipping and shipbuilding organisations, including navies, to become RINA members.
 - Encourage appropriately-qualified naval officers to acquire/maintain RINA membership.
 - Continue to encourage and publish papers on technical aspects of naval ships.
 7. The Institution should refrain from developing “colleges” to signify to the outside world the specialties of individual naval architects, for reasons of cost and complexity of resourcing/administration for a relatively small institution.
 8. The Institution needs to be able to demonstrate value to its membership, including those who are not necessarily qualified in naval architecture, and to employers in the maritime industry, that it is the pre-eminent professional society in maritime engineering worthy of paying fees and sponsoring events.
 9. Specifically with regard to technical meetings, the current situation with regard to COVID-19 brings to prominence a number of risks and opportunities

which must be addressed promptly through the following:

- For now, Branch/Section technical meetings should be virtual/online meetings.
- Technical meetings need not involve presenters and participants meeting in one location; this may improve the availability and quality of technical presentations and increase the visibility of our activities.
- To broaden technical meeting audiences, sponsoring Branches/Sections should publicise each event with other Branches/Sections in nearby time zones.
- RINA technical presentations should be branded along lines shown earlier.
- Adequate number and capacity of channels is required for RINA meetings.

Conclusion

RINA Council convened a Working Group in May 2020 to look into *The Roles and Capabilities of Naval Architects*. The Working Group reported back to Council, and the recommendations in the report, which are fairly general, were adopted in principle by RINA Council at its meeting in October 2020.

However, Council is looking for further input from as wide a cross-section as possible and, to this end, comments and ideas from all participants are sought, both now at this presentation and subsequently — for which a form will be circulated to all meeting participants. Comments are due to the Secretary of the Australian Division of RINA by 7 January 2021 to allow time for compilation and forwarding to London.

Input from all sources will be considered further at the next Council meeting in January 2021, particularly with regard to the specific actions to be taken.

Question/Comment time elicited some further interesting points.

Rob’s presentation was recorded, and is now available on the RINA YouTube channel (see *The Internet* column).

Phil Helmore

CLASSIFICATION SOCIETY NEWS

ABS Publishes Guide for Sustainability

ABS has published the *Guide for Sustainability Notations* to help marine and offshore operators meet the Environmental, Social and Governance (ESG) requirements outlined in the United Nations’ Sustainable Development Goals (SDGs).

ABS has also launched two new sustainability notations, SUSTAIN-1 and SUSTAIN-2, to help marine and offshore operators demonstrate alignment with the SDGs and establish a pathway for sustainability certification and reporting.

“We are responding to the growing interest in the SDGs from the maritime industry. The *Guide* demonstrates how sustainability can be directly linked to design and operations. It also provides a vehicle for demonstrating the sustainability of vessels to the investor side, which is

increasingly vital,” said Georgios Plevrakis, ABS Director, Global Sustainability. “The optional notations align with the industry’s initiatives for green and sustainable financing and operations.”

The UN Agenda for Sustainable Development, which includes the 17 SDGs, aims to provide a blueprint for a transition to a healthier planet. With specific targets, the goals, as applicable to the maritime industry, address areas such as waste streams, air emissions, energy efficiency, ship recycling, low-carbon fuels and human element considerations.

The *Guide* focuses on sustainability aspects of vessel design, outfitting and layout which can be controlled, measured, and assessed. These include: pollution and waste; coastal and marine ecosystems; energy efficiency and performance

monitoring; low-carbon fuels; human-centered design; and asset recycling. To download a copy of the *Guide for Sustainability Notations* simply search the web for that title.
ABS News, 1 December 2020

ABS to Class First Jones Act Wind Farm SOV

The first US-flagged Jones Act offshore wind farm service operation vessel (SOV) ever ordered will be built to ABS Class. The SOV will be engineered, constructed and operated by Edison Chouest Offshore (ECO) for long-term charter to service the planned Revolution Wind, South Fork Wind and Sunrise Wind offshore wind farms in the northeast United States.

“ABS’ unique understanding of the US regulatory environment and our industry-leading offshore experience means that we are uniquely well placed to support projects such as this. We are fully committed to supporting development of the US offshore wind industry and proud to be part of this initiative, which will play a key role in delivering its exciting potential,” said Matt Tremblay, ABS Senior Vice President, Global Offshore.

Gary Chouest, ECO President and CEO, said “We are unique in the US offshore marine vessel industry with our own in-house design and engineering group, our own shipyards, and a wealth of expertise in the offshore industry. This puts us in an industry-leading position as the only US company capable of fully engineering, constructing and operating specialised vessels for this market. ECO put the first deep-water support vessel in the Brazil offshore market, *Damon Chouest*, in 1991. ECO put the first purpose-designed and -built deep-water support vessel in the Gulf of Mexico, *Amy Chouest*, in 1992. And now ECO will again be first by placing the first SOV in the U.S. wind farm market.”

The 80 m long vessel, which will be capable of housing 70 passengers/wind turbine technicians, will operate on diesel-electric power meeting EPA Tier 4 emission standards, and will feature proprietary ECO variable-frequency drive to substantially reduce fuel consumption and greenhouse gas emissions.

ABS News, 27 January 2021



80 m SOV for Edison Chouest Offshore
(Image from ABS website)

DNV GL and HHI Group Present Green Tankers of the Future

DNV GL and HHI Group, the world’s largest shipyard, have teamed up to embark on the development of future-proof tanker designs. In a recent *Green Tankers towards 2050* industry webinar, attended by more than 250 participants from shipping companies around the world, DNV GL and HHI Group presented the results of new joint research and explained how eco-friendly maritime solutions can help shipowners and managers to cope with stricter environmental regulations, now and in the future.

The joint research was initiated by a memorandum of understanding (MOU) signed at the Gastech trade fair in Houston 2019, when DNV GL and HHI agreed to develop low- and zero-carbon solutions for shipping. The results of the MOU were presented by lead researchers from HHI Group companies Korea Shipbuilding & Offshore Engineering (KSOE), Hyundai Heavy Industries (HHI) and Hyundai Mipo Dockyard (HMD) in a virtual format, co-hosted by DNV GL from their headquarters in Høvik, Norway.

“Shipowners are faced with many uncertainties in the rapidly-changing marketplace,” said Seong-Yong Park, COO and SEVP of HHI Group. “We believe our research results, including proven engineering solutions and alternative fuels, will support them in developing their future strategy for ship operations and fleet renewal.”

During the webinar, DNV GL and HHI Group experts explained the recent development of regulations covering the greenhouse gas emissions from vessels, including the introduction of the design index for existing vessels (EEXI) and a new Carbon Intensity Indicator, which are due to enter into force in 2023. To respond to these regulations, HHI Group introduced their range of eco-friendly ships which are equipped with alternative fuel technologies and energy-reduction systems, among them 40 LNG dual-fuelled ships already delivered or under construction.

“The International Maritime Organization (IMO) is strengthening environmental regulations, including a 50% reduction in ship greenhouse gas emissions by 2050 compared to 2008,” commented H. J. Shin, Head of the Future Ship Research Department at KSOE. “We will help the shipping industry to reach these ambitious goals by taking a leading position in the eco-friendly maritime era through research and development.”

By applying DNV GL’s data-based carbon robust model to its very large crude carriers (VLCC) and medium-range (MR) tankers, HHI Group found that an LNG fuel propulsion system in combination with advanced energy-saving devices (ESDs) can enable a vessel to meet the new Carbon Intensity Indicator over its expected lifetime.

“It is important to use alternative fuels like LNG and technological solutions which are available now, and not wait until 2030 or beyond”, stressed Y. H. Chung, Head of the Initial Design Department at HMD. “Our joint research has shown that LNG as a ship fuel combined with other energy-saving devices can make a vessel both environmentally and economically fit for the next two decades at least,” said Mr Chung.

“Since ESDs mainly have an impact on fuel consumption during sailing, the benefits are greater for large vessels such as VLCCs, which spend more days operating at sea,” explained Christos Chryssakis, Business Development Manager at DNV GL — Maritime. “These ships are also less sensitive to price variations when it comes to selection of LNG as fuel. This is because the capital expenditures are paid back faster due to a higher fuel consumption.” For smaller vessels with lower fuel consumption, such as MR tankers, a higher price differential between very-low-sulphur fuel oil (VLSFO) and LNG was required to pay back the initial investment. Therefore, these vessels were more sensitive to volatile fuel prices, he added.

“We have no clear vision yet of the zero-carbon ship in deep-sea shipping,” said Trond Hodne, Senior Vice President Business Development at DNV GL — Maritime. “As we work hard towards the zero-emission vessel, the industry also needs to make newbuilding decisions today. Thus, we should not make perfect the enemy of good. As demonstrated by HHI Group and our experts, we have energy-efficient designs and technologies at hand which will enable ships to meet the IMO emission trajectories through their entire lifetime. These highly-efficient vessels are likely to be attractive to charterers and investors today, and even more so if CO₂ will have a cost.”

DNV GL News, 18 December 2020

DNV GL to Change Name to DNV

DNV GL, the assurance and risk management company, will change its name to DNV on 1 March 2021. The move comes after a comprehensive review of the company’s strategy as it positions itself for a world in which many of DNV’s markets are undergoing fundamental change.

The present name has been in place since the 2013 merger between DNV (Det Norske Veritas) and GL (Germanischer Lloyd). The name simplification is a natural consequence of a successfully-completed merger and of having operated as a fully-integrated company for several years now.

Remi Eriksen, Group President and CEO, said “We merged two leading companies with complementary strengths and market positions, and combining the two names was the right solution in 2013. However, it was not a name that rolled off the tongue, and many customers already refer to the company as DNV. Our brand is used by many of our customers to build trust towards their stakeholders, and a simpler name will be an even stronger trust mark for our customers in the future, but still carries with it all our strengths and proud 157-year-old legacy with a purpose to safeguard life, property and the environment.”

The 2020s has been called the decade of transformation, or the “exponential decade”, where the pace of the energy transition will be set and where food, health and transport systems will change immensely and digital technologies underpinning industry 4.0 will mature from experimentation into large-scale application. Most importantly, this is the decade where humanity will succeed or fail to deliver on the Sustainable Development Goals.

As companies take on the complexities of digitalisation and decarbonisation, they need trust and assurance. Assurance is not only a service, but also the fundamental value created as

a result of the services delivered by DNV. DNV’s ambition is to shape the future of assurance with more digitalised services and by leading the assurance of digitalisation in the form of assuring data, digital twins and digitised processes.

“Our strategy not only positions us for significant growth in a world increasingly in need of a trusted voice, but also positions us to shape the future of assurance,” said Eriksen. “DNV will offer the best, most efficient and digitalised ways of delivering services — be it classification, certification, verification, inspection, advisory, or digital solutions.”

DNV GL News, 13 January 2021

DNV GL awards AIP to KSOE for Wing-sail Propulsion System

DNV GL has awarded an Approval in Principle (AIP) to Korea Shipbuilding and Offshore Engineering (KSOE) for a wing-sail auxiliary propulsion system for ships — the result of a joint research project between KSOE and SK Shipping. The virtual award ceremony recently took place in the presence of Hyunjoon Shin, Head of the Future Ship Research Department of KSOE, Haeyong Son, Vice President of SK Shipping, and Sung Ho Shin, Key Account Manager of DNV GL Korea.

The wind-powered auxiliary propulsion system for ships is the result of a joint research project from KSOE, the shipbuilding holding company of Hyundai Heavy Industries Group, and SK Shipping, to develop wind-powered eco-friendly propulsion solutions.

“We are speeding up efforts to bring eco-friendly technologies to the market. The wing-sail system will reduce fuel consumption by more than 6%. We will take the lead in the next-generation ship market and continue to strengthen our technological competitiveness,” said Hyunjoon Shin of KSOE.

“This is a promising technology which shows new possibilities for ship owners to be able to meet IMO standards for reducing carbon emissions,” added Haeyong Son of SK Shipping.

The wing-sail design is 20 m wide, 50 m high, and is installed vertically on both sides of the deck. It rotates its wings according to the direction and intensity of the wind to provide auxiliary propulsion for the ship. The wing can be lowered to 10 m in height, making it flexible in case of bad weather or when passing under a bridge.

DNV GL undertook the AIP by reviewing the initial drawings related to design loads, system responses, redundancies and components submitted by KSOE, while SK Shipping provided their expertise and insights on the technology from an owner’s point of view.

“As a result of the joint research with two leaders of Korea’s maritime cluster, it was a meaningful project to which we contributed our expertise. Wind propulsion for ships is an effective solution which helps meet the IMO regulations for greener shipping. DNV GL is ready to deliver a wide range of related services for further projects,” said Vidar Dolonen, DNV GL Regional Manager Korea and Japan.

The new wing-sail propulsion system can be installed on many types of vessels and is expected to further increase the efficiency of future ship operations. The AIP is also a

big step towards awarding a ship DNV GL's new additional class notation, WAPS (Wind Assisted Propulsion System). In addition, DNV GL has recently developed a standard for the certification of wind-assisted propulsion systems in response to enquiries for the independent assessment of those systems.
DNV GL News, 22 January 2021

LR and NETSCo to Develop Jones Act-compliant WTIV

Lloyd's Register North America, Inc. (LR) has signed an agreement for a joint development project (JDP) with Northeast Technical Services Co., Inc. (NETSCo) to design and develop a Jones Act-compliant wind turbine installation vessel (WTIV).

The Jones Act, or Merchant Marine Act of 1920, requires any vessel transporting cargo between US ports, or between US ports and offshore facilities, to be built and flagged in the USA. In 2019, the US House of Representatives passed the Expanding Access to Sustainable Energy Act which includes an amendment which would enforce Jones Act requirements for all offshore renewable-energy production. This means that US-built ships, flagged in the US and manned by US nationals, will be required for the installation of wind power plants, and for the supply and service of facilities. In addition to this, in early December 2020 the US Senate passed the National Defense Authorisation Act for the fiscal year 2021. This bill includes an amendment ensuring full enforcement of the Jones Act and other federal laws in offshore wind development.

As part of the JDP, NETSCo engineers and naval architects will be responsible for the concept design of the WTIV. NETSCo's WTIV design will be focused on meeting the requirements of current developments along the US East Coast and the US Great Lakes, such as crane capacity, deck space and water depth. Another key feature of the design is that it will use hull shapes which are common in the US shipbuilding market, therefore ensuring that it could be built in US shipyards.

LR will review and evaluate NETSCo's concept design to ensure that the vessel complies with applicable rules and regulations. LR's team of technical compliance experts will also evaluate the design against international codes and standards and the US Coast Guard's Code of Federal Regulations (CFRs).

Jan Flores, Vice President of NETSCo, commented "The lack of Jones Act-compliant wind turbine installation vessels has become a major challenge for offshore wind turbine developers. With years of research and development in this industry, it is a perfect opportunity for us to leverage our engineering expertise in a strong collaborative enterprise with LR. This collaboration was a cumulation of efforts to better support the offshore wind turbine market with a Jones Act-compliant vessel alternative, as well as offering conversion options for vessels which have been dry-docked during this economic downturn. We look forward to our continued work with LR for their guidance and expertise in classification, compliance and advisory services in the offshore industry."

Rafael Riva, LR's Americas Marine and Offshore Commercial Manager, said "The offshore wind industry is expected to see exponential growth in the United States. There are currently no US-built wind turbine installation vessels, and if the sector takes off as expected, then there will be a pressing requirement for such vessels. What truly sets LR apart is our in-depth understanding of specific port logistics to handle WTIVs, from the significant advisory work undertaken for some of the designated US East Coast ports and how this will impact the optimal operation of these vessels in the specific environment. This collaboration with NETSCo to develop a Jones Act-compliant wind turbine installation vessel represents an essential development to support the US offshore wind industry."

LR News, 16 December 2020

WHY USE NAVAL SERVICES FROM DNV GL



DNV GL PROVIDES ASSURANCE,
CERTIFICATION AND TECHNICAL
SUPPORT TO GOVERNMENT AND NAVY



DNV·GL

First Vessel Certified with Responsible Fishing Vessel Standard by LR

Global Seafood Assurances (GSA) has announced that the first vessel to achieve the Responsible Fishing Vessel Standard (RFVS) has been awarded the RFVS certificate by Lloyds Register. The vessel, *Antarctic Discovery*, belongs to Australian Longline Fishing, operating in Marine Stewardship Council (MSC)-certified fisheries for Patagonian and Antarctic Toothfish. The 56 m vessel carries a crew of 20–25, plus two observers, for trips into very challenging waters, often for a couple of months at a time.

“We were very keen to get independent, credible, certification which shows that we recruit and care for our crews in accordance with global conventions. Our customers need that assurance. Now we can demonstrate that we are caring for both the fish and the people who harvest them, and we all feel good about that” commented Malcolm McNeill, Managing Director, Australian Longline Fishing.

Preparation and timing were cited as key to a successful audit by Marty Johnson, Vessel Coordinator. The vessel was in dock in New Zealand being prepared for its next trip, while Marty Johnson was in Hobart, where the company is based. Audit days and crew interviews were carefully planned so as not to detract from those preparations.

“Spending time discussing what we needed to prepare, with Global Seafood Assurance and with Lloyd’s Register, helped make sure that we used audit time efficiently. We needed to sharpen up in a few areas, but that was a useful exercise in itself”, said Marty Johnson. “We plan to have a second vessel audited in a few months and will be even better prepared.”

“I am delighted that the first vessel to be awarded under GSA’s Responsible Fishing Vessel Standard, operates in a MSC-certified fishery. Whilst the MSC standard is focussed on environmental criteria, we have long recognised the industry-wide importance of strengthening workers’ protection and welfare at sea. MSC participated in the development process for the RFVS, and very much welcomes this and other initiatives which seek to verify and improve labour conditions and crew welfare at the vessel level through independent verification processes”, commented Rupert Howes, CEO Marine Stewardship Council. “That vessels already participating in the MSC programme are part of the first wave to undergo RFVS audits is a huge credit to their skippers and crews, and testament to the fact that many of our partners set the benchmark for best practice across the global fishing industry.”

LR News, 19 January 2021

FROM THE CROWS NEST

Ocius Technology’s *Bonnie* Christened

The second of Ocius Technology’s new generation 6.7 m Bluebottle unmanned surface vessels, *Bonnie*, was christened on 24 November. The christening was by Susan Dane, wife of Robert Dane, founder and CEO of Ocius Technology. The christening took place at Ocius Technology’s premises at the UNSW Randwick campus and, due to COVID-19 restrictions, was streamed live via the Google Hangouts platform.

There was a small number of elite guests present at the christening, with 22 participating online. Guests included Chris Jenkins, CEO and Troy Stepherns, Gav Henry, Jasmin Hilliard and Daniel Dent, Thales Australia; LCDR Peter Talbot, DST Group; Faith Chen, Systems Engineer, L3; Nick Gibbs, CEO Collins Aerospace; Suzanne Birch, Senior Manager Future Business, BAE; Andy James, BD Maritime Sonartech; Bevan Conole, BD Maritime Ultra; Ocius board members Mark Bethwaite, Rick Turner and Andrew Aitken; the whole team at Randwick; those of the team doing live trials off Ulladulla on a rudder flipper; all the guests online, including the team at One2three Naval Architects, and Brett and the building team at Morriset.

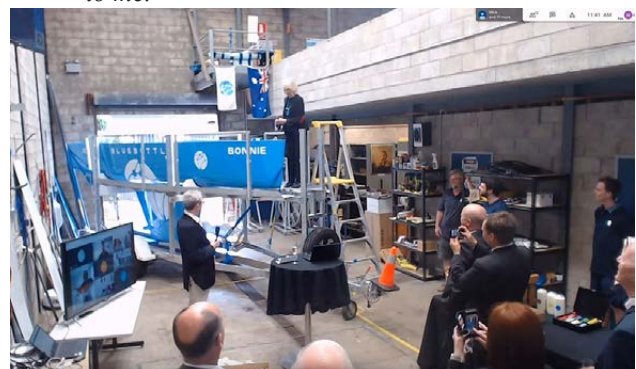
Robert Dane welcomed all the guests and participants, and opened proceedings with a few words about Ocius and why they are developing the Bluebottles. The oceans cover 70% of the earth’s surface, and we know about as much about them as the surface of Mars; Ocius’ mission is to add to the knowledge. *Bonnie* is the second of the Beth-class Bluebottles. *Bruce* and *Bob* were 19 ft (5.79 m), where the Beth-class boats are 22 ft (6.70 m) long. The increase in size means that the Beth-class vessels have twice the power, payload, performance and winch size than *Bruce* and *Bob*,
The Australian Naval Architect

while still enabling transport by an RTA-registered trailer, and launch and recovery (LARS) from a conventional boat ramp by two people. There is a saying at sea that “There is no replacement for displacement”. Well, in fact, there is: you can have a big swarm of small vessels!

Susan Dane christened the vessel *Bonnie* with champagne, using the Ocius wording *God bless this ship Beth and all those who don’t sail in her!*

Robert then asked the guests to join him in singing the traditional Scottish folk song:

*My bonnie lies over the ocean
My bonnie lies over the sea
My bonnie lies over the ocean
Oh bring back my bonnie to me
Bring back, bring back, oh bring back my bonnie
to me, to me
Bring back, bring back, oh bring back my bonnie
to me.*



Susan Dane pouring the champagne to christen *Bonnie*
(Photo courtesy Ocius Technology)

Following the christening, Ocius provided champagne toasts for the guests, followed by drinks and canapes.

The speeches and christening are now up on the web at <https://www.youtube.com/watch?v=sEQKMTgsmxM&feature=youtu.be>

In 2021, *Beth* will be joined in Darwin by her sisters *Bonnie* and three more 6.7 m bluebottles to demonstrate the potential capability of an intelligent network of persistent USVs armed with Thales thin-line sonar arrays, radars, cameras and other sensors.

There is a video of the underwater power flipper on *Beth* in operation with a friendly pod of dolphins at https://www.youtube.com/watch?fbclid=IwAR0UagjVCJEn-N8-rIJXc_UQyorOJ2U_8dUtZXz-Th50DFpHE29FqyW4nwY&v=bIBs0M0IZ2Y&feature=youtu.be

Phil Helmore

Australian Marine Industry Awards 2020

The resilience of the Australian marine industry was showcased on 12 November at the 2020 annual Australian Marine Industry Awards hosted at the Southport Yacht Club on the Gold Coast by the Australian International Marine Export Group (AIMEX). The COVID-safe event was also streamed live online, and celebrated the outstanding achievers in the Australian marine export, superyacht and commercial sectors.

Setting the tone for the night was MC Steven Bradbury OAM, Australian Olympic Champion and motivational speaker who, throughout the evening, shone a light on the benefits of positive thinking.

The innovation, skills, expertise and quality of the industry was demonstrated by deserving winners across twelve categories. It was apparent that the industry is thriving and continuing to grow with significant investment by key players into enhancing facilities and developing capability. Given that the event was the first major marine event to go ahead since the COVID-19 pandemic hit, the industry was out for a good night. The atmosphere was charged with energy and positiveness and the genuine camaraderie that is so evident in the Australian marine industry was definitely on display.

AIMEX CEO, David Good, said “Due to interstate restrictions, the event was livestreamed into the homes of members unable to travel. A satellite event for 22 members in Sydney occurred at the Royal Sydney Yacht Squadron; where all who attended made the most of meeting face-to-face, many for the first time this year. Everyone watching online thoroughly enjoyed being able to join in, laugh and cheer with the members in the room in Southport.”

Of note for *The ANA* were the following awards:

- Commercial Marine Project/Design or Manufacturer of the Year, sponsored by The Yard Brisbane. Won by Aus Ships Group for the design and build of the 90 ft (27.43 m), 170 passenger ferry *Yoogera*, named after a part of the Brisbane River where she operates.
- Commercial Marine Service Provider of the Year Award, sponsored by The Yard Brisbane. Won by Spear Green Design.
- Innovative Commercial Product or Service of the Year

February 2021

sponsored by Rivergate Marina and Shipyard. Won by BtB Marine for their 750 Ultra Long-Range workboat.

- Superyacht Industry Service Provider of the Year, sponsored by Hill Robinson Yacht Management. Won by Rivergate Marina and Shipyard
- Superyacht Industry Project/Design or Manufacturer of the Year, sponsored by Rivergate Marina and Shipyard. Won by Gold Coast City Marina and Shipyard.
- Exporter of the year. Won by Riviera Australia.
- Apprentice of the year (inaugural award). Jasmine Willoughby of Aus Ships Group

Sail-World News, 13 November 2020



Aus Ships group celebrating their win
(Photo courtesy Salty Dingo)



David Good, AIMEX CEO, with Jeremy Spear,
Spear Green Design
(Photo courtesy AIMEX)



The Riviera team
(Photo courtesy Salty Dingo)

WWSR *Spirit 2*

On 8 October 1978, 42 years ago, Ken Warby blasted across Blowering Dam to set his second (and current) World Water Speed Record of 317.6 mph (511.1 km/h), thus becoming the first person to officially break the 300 mph and 500 km/h barriers, the only person to ever design, build and drive a boat to a World Water Speed Record, and still the only person in the world to hold these records.

Dave Warby of Warby Motorsport is attempting to break his father Ken's record in *Spirit of Australia* in their latest vessel, *Spirit of Australia 2*.

Over summer, the team stays away from Blowering Dam as the locals use it extensively over the Christmas and New year period. The team are now working on fine tuning the boat, and expect to be back on the Dam in March, and plan to do a few tests within eight weeks of each other to make up for lost time as a result of the pandemic last year.

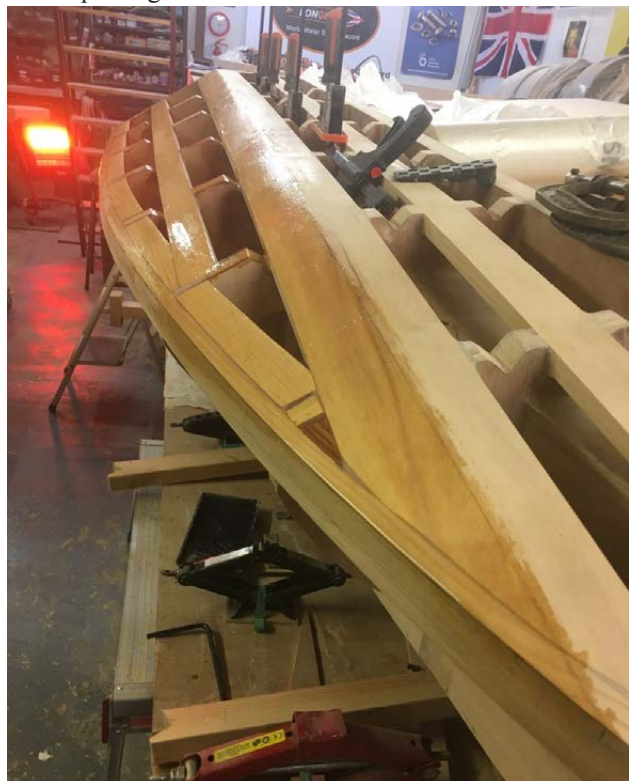
Dave Warby gave a presentation on *Spirit of Australia 2* and the World Water Speed Record to the ACT Section of RINA on 1 December 2020 (see *News from the ACT Section* in this issue of *The ANA*).

Phil Helmore

WWSR *Longbow*

Britain has re-entered the contest for the World Water Speed Record with a new vessel, *Longbow*, having commenced construction in April 2018.

The *Longbow* team has been progressing construction, but is being severely hampered by COVID-19 restrictions in Lancashire, England. Project Coordinator, David Aldred, his wife Gill and son Tom have continued working on their own, and have now completed the forward sponsons and the aft planing shoe.



Starboard sponson under construction on *Longbow*
(Photo from Longbow website)



Sponsons and planing shoe complete on *Longbow*
(Photo from Longbow website)

[For further details, visit the Longbow website, <https://www.jet-hydroplane.uk/> — Ed.]
Longbow website

SP80 Aims for World Sailing Speed Record

The world sailing speed record is currently held by Australian Paul Larsen in *Vestas Sailrocket 2* at an average speed of 65.45 kn (121.1 km/h) over the 500 m track. *SP80* is the vessel being designed and built by three young engineering students from the Swiss engineering school École Polytechnique Fédérale de Lausanne (EPFL) to attempt the world sailing speed record in 2022 and take it back to Europe. To achieve their goal they are aiming for a speed of 80 kn (148 km/h) using a boat with shaped hulls, propelled by a the usual kite wing, while the overall stability is achieved via super-ventilating hydrofoils.

The team have built a prototype model at a scale of 1:2 and instrumented it, and have been testing by towing with a RIB in place of the usual kite. There is a video of the construction and prototype testing at <https://sp80.ch/home/news/#articles> (scroll down to *The Prototype #3 — The story behind it*).

The projected timescale is to build and launch the full-sized vessel in 2021, and go for the World Speed Sailing Record in 2022.

SP80 website



SP80 prototype model being tested on Lake Geneva
(Photo from SP80 video)

GENERAL NEWS

Incat delivers *Buccoo Reef*

Incat Tasmania has delivered its latest large fast ferry, a 100 m catamaran for the government of Trinidad and Tobago's National Infrastructure Development Company (NIDCO). *Buccoo Reef*, Incat hull 094, left Hobart for Port of Spain on 21 January.

Buccoo Reef is another of Incat Tasmania's new-generation fast ferries fully designed and built in Australia. *Buccoo Reef* benefits from enhanced seakeeping qualities, being built with the recently-introduced centre bow arrangement.

Incat Tasmania's Chief Executive Officer, Tim Burnell, said "As islanders ourselves, we fully appreciate the critical importance of maintaining comfortable and reliable year-round passenger and freight services.

"Incat has invested in extensive tank testing and studies using the latest computational fluid dynamics and hydrodynamic free-running model-test techniques. The result is the new arrangement to Incat's signature centre-bow profile, ensuring *Buccoo Reef* is truly fit-for-purpose on year-round ferry operations on what is an exposed sea-bridge between Trinidad and Tobago," he said.

"The largest high-speed ferry designed and built for Trinidad and Tobago, *Buccoo Reef*, not only delivers enhanced seakeeping but also increased reliability, passenger comfort, capacity and economy with less operational downtime due to adverse weather conditions.

"We take the approach of doing things right from the outset; good design, the highest quality materials, quality workmanship by a highly-experienced team; and rigorous pre-delivery trials and testing; a fact borne out by Incat having the lowest warranty claims in the high-speed ferry industry," Tim Burnell said.

Buccoo Reef has been constructed in Hobart utilising renewable green energy. "100% of the energy consumed in the manufacture of *Buccoo Reef* was derived from locally-generated renewable green-energy sources consisting of hydro, wind and solar," Tim Burnell said.

Flexible rubber mounts between the superstructure and hull will ensure that passengers travelling on *Buccoo Reef* enjoy an atmosphere of comfort and relaxation afforded by quiet and vibration-free lounges.

The vessel can accommodate 995 passengers and crew, with 175 truck lane metres plus 182 cars, or space for a total of 239 cars on the main and mezzanine decks.

Four resiliently-mounted MAN 28/33D STV 16V marine diesel engines, rated at 7280 kW each, provide her propulsion. Thrust vectoring and steering is provided by four Wärtsilä WXJ 1200 SRi waterjets, connected to each engine via four steel and composite shafts and ZF 535000NR2H gearboxes.

Four caterpillar C9.3 250 kW marine brushless self-excited alternators supply electrical power. 400 V, 60 Hz, three-phase



Buccoo Reef on trials
(Photo courtesy Incat)

four-wire distribution with neutral earth allows a 230 V electrical supply using one phase and one neutral.

Buccoo Reef is fitted with a Naiad active ride-control system to maximise passenger comfort. This system combines active trim tabs at the stern with a retractable active-fin T-foil at the bow. When not required, the T-Foil withdraws behind the latest Incat centre-bow design to maximise speed and efficiency.

On sea trials off the southern coast of Tasmania, *Buccoo Reef* achieved maximum speeds in excess of 45 kn.

Buccoo Reef is the 48th large commercial fast ferry built by Incat Tasmania and the ninth in excess of 7000 GT delivered in the past 13 years.

The ship delivery voyage to Trinidad and Tobago was anticipated to take about a month via Tahiti and the Panama Canal.

Buccoo Reef is named after the largest coral reef in Tobago which was designated as a marine park in 1973. Its massive proportions contain a reef system of five reef flats which are separated by deep channels.

Principal Particulars

Designer	Revolution Design Pty Ltd
Length OA	100 m
Length WL	92.4 m
Beam moulded	26.6 m
Beam, hulls	4.5 m
Draft	3.7 m
Speed	39.5 kn at 100% MCR with 400 t deadweight

Capacities

Deadweight	760 tonnes
Passengers	995 passengers and crew
Vehicles	239 cars, or 175 truck lane metres plus 182 cars

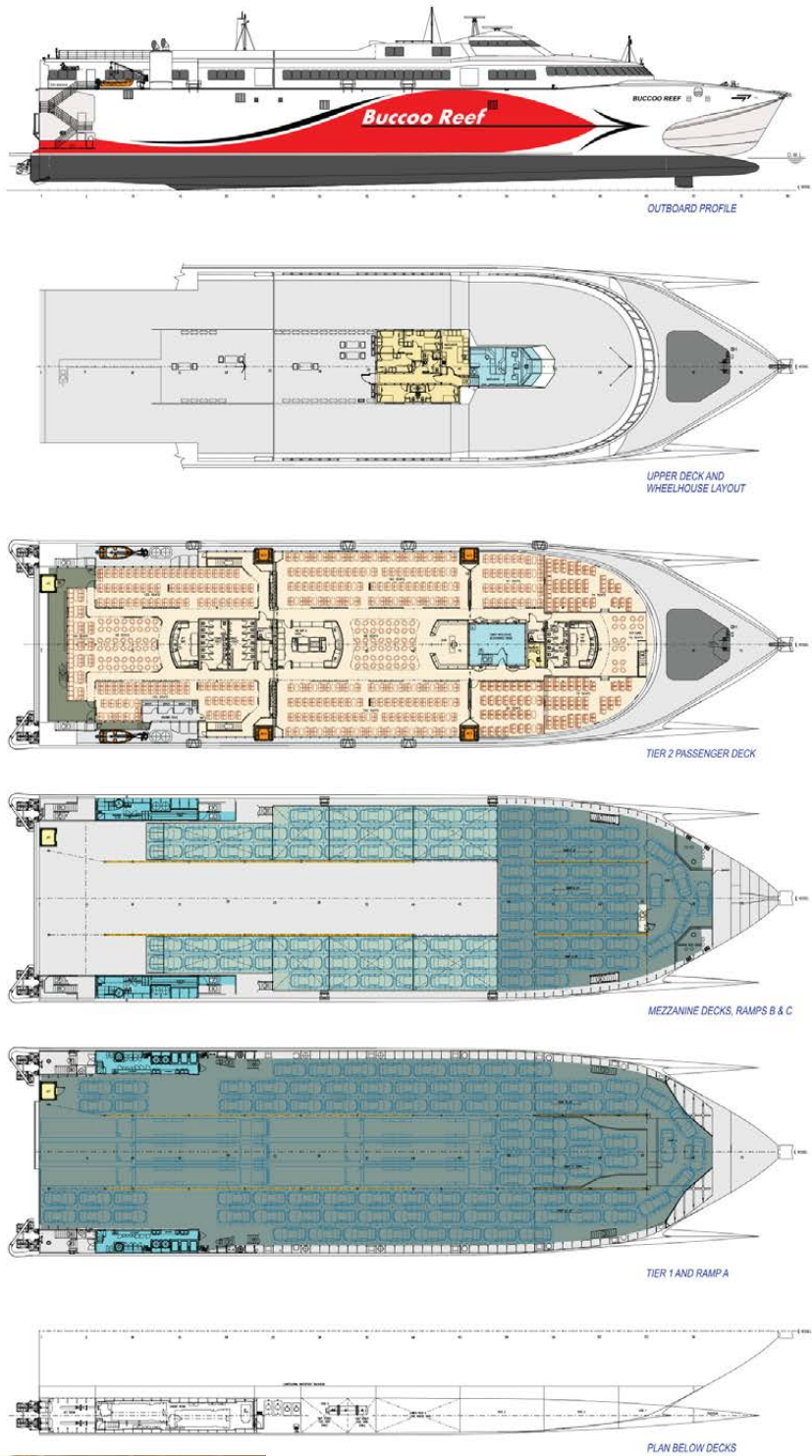
Machinery

Main Engines	4 × MAN 16V 28/33 STC diesels each rated at 7280 kW
Water Jets	4 × Wärtsilä WXJ 1200 SRI
Gearboxes	4 × ZF 53500NR2H
Ride Control	Naiad Dynamics active trim tabs aft and retractable T-foil
Class	✱DNV ✱1A1 HSLC R1 Car Ferry "B" E



Buccoo Reef at speed showing her centre bow
(Photo courtesy Incat)

General Arrangement of
Buccoo Reef
(Drawing courtesy Incat)



VIP tub seating in the forward lounge
(Photo courtesy Incat)



Passenger seating in the aft lounge
(Photo courtesy Incat)

Construction of Third Patrol Boat for RAN starts at Austal

At the end of November, Austal announced that Austal Australia had ‘cut metal’ on the third of six new Cape-class patrol boats for the Royal Australian Navy.

The plate-cutting marks the start of construction of Hull 813, part of a \$324 million six-vessel contract which was announced on 1 May 2020.

Austal’s Chief Executive Officer, David Singleton, said that the Henderson, Western Australia, shipyard now had five Cape-class patrol boats in various stages of production, for export and local customers.

“This third Cape for the Royal Australian Navy adds to the two already under construction. Lined up prior to those, we have two more Capes for the Trinidad and Tobago Coast Guard, which are on track for delivery in the first half of 2021,” Mr Singleton said.

“It’s great to see the shipyard bustling with work, on both local and export defence contracts which are helping to build Australia’s sovereign shipbuilding capability.

“We’re very proud of the demonstrated capability and productivity of our Australian operations to manage multiple projects – supported on every vessel by our proven Australian supply chain.”

Based on Austal’s proven 58 m aluminium monohull patrol-boat design, the new RAN Capes include a number of enhancements which further extend the capability of the vessel and the fleet. Crew accommodation has been

increased by 10 people, to now total 32 and ‘quality-of-life’ provisions have been enhanced, ensuring those who operate the new Capes have wi-fi connectivity to the outside world regardless of the operating environment.

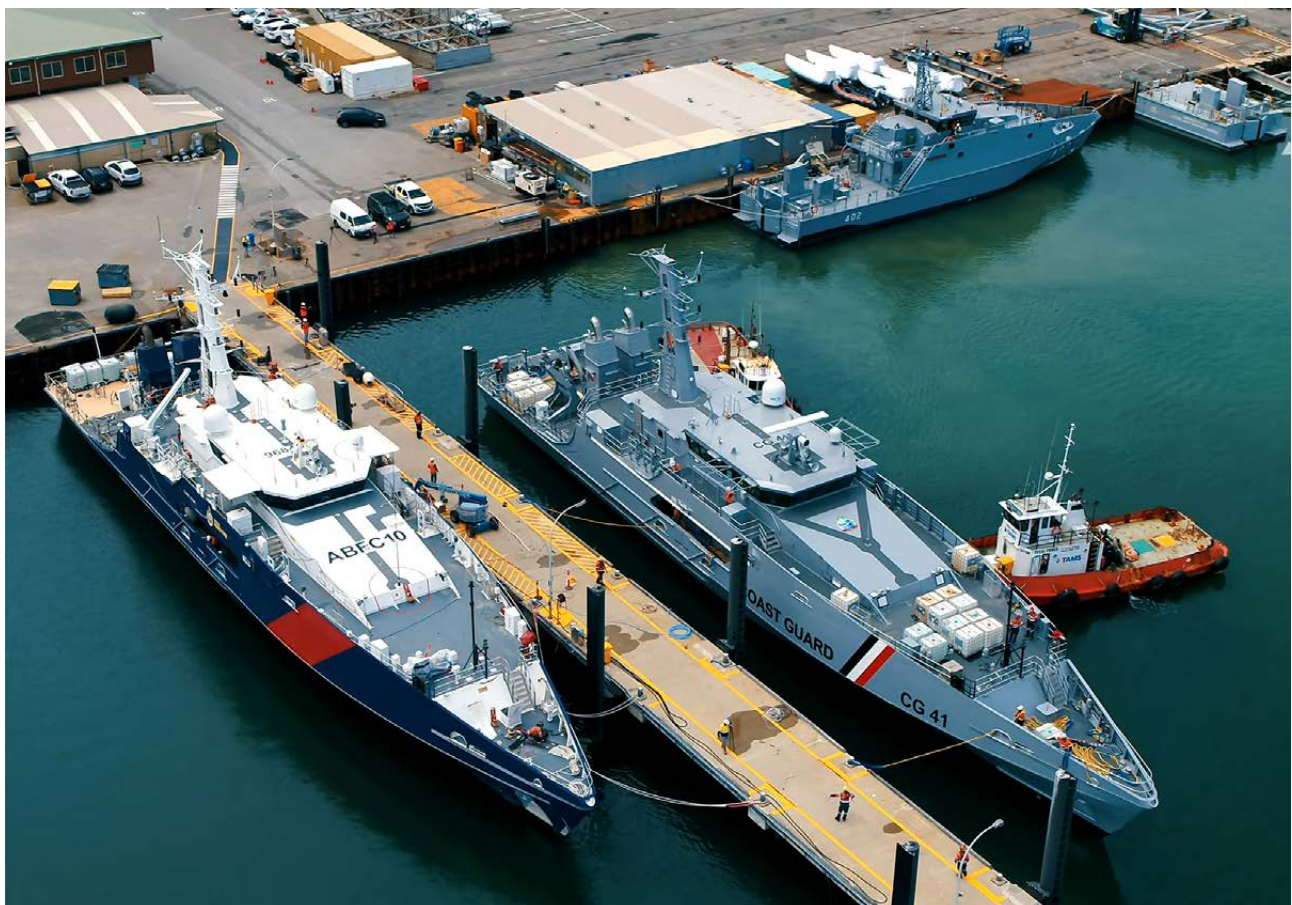
Delivery of the first of the six patrol boats, Hull 811, is scheduled for September 2021 with subsequent deliveries of remaining vessels through to mid-2023.

Austal Launches Export Patrol Vessel

On 3 December 2020 Austal Australia launched the first of two Cape-class patrol boats for the Trinidad and Tobago Coast Guard (TTCG), at the company’s Henderson shipyard. Under a \$126 million contract awarded by the Government of the Republic of Trinidad and Tobago, Austal is constructing two 58 m Cape-class patrol boats for the TTCG, scheduled for delivery in the first half of 2021.



The first of two new Cape-class Patrol Boats recently launched by Austal for the Trinidad and Tobago Coast Guard
(Photo courtesy Austal)



The new patrol boat for the Trinidad and Tobago Coast Guard, CG41 (centre), is berthed after launching next to the Australian Border Force patrol boat *Cape York*
(Photo courtesy Austal)

The new TTCG Capes are based on the 58 metre aluminium monohull patrol boat, first developed by Austal in Australia for Australian Border Force. The vessels have a 4000 n mile range and 28-day patrol cycle, with a crew of up to 22. Each Cape is equipped with two high-speed 7.3 m rigid hull inflatable boats used for intercepting other vessels.

NUSHIP *Supply* Acceptance

Defence's contract with Spain's Navantia S.A. has reached a major milestone with Ship Acceptance of the Royal Australian Navy's first Supply-class vessel, NUSHIP *Supply*.

The Minister for Defence, Senator the Hon. Linda Reynolds CSC, announced the formal acceptance of the Auxiliary Oiler Replenishment ship (AOR), NUSHIP *Supply* from the Spanish shipbuilder, Navantia S.A.

"Despite the impacts of COVID-19, the Australian Government has worked with the prime and sub-contractors to innovate and implement solutions to deliver the Royal Australian Navy's first Supply-class vessel, *Supply*, based on the Spanish Cantabria design," Minister Reynolds said.

"The Australian Government remains committed to maximising Australian industry involvement in the shipbuilding enterprise.

"Australian industry benefited with more than \$130 million spent on engagement of local industry partners to support the ship's fit-out in Australia."

With Australia's current replenishment capability reaching its end of life in 2021, NUSHIP *Supply* will be the first AOR

to replace the retired HMAS *Success* and bridge Navy's current capability gap. NUSHIP *Stalwart* is expected to enter service in late 2021.

The Australian Government signed contracts with Navantia S.A to build Australia's two replacement AORs in May 2016.

NUSHIP *Supply* was launched in Ferrol, Spain, in November 2018 and arrived at HMAS *Stirling*, Fleet Base West, in Western Australia, on 2 October 2020 for final fitting out and testing activities. NUSHIP *Supply* arrived at her homeport of Sydney on Friday 15 January 2021.

Hunter-class Prototyping Begins

Prototyping is underway at the Osborne shipyard in Adelaide in preparation for work to start on Navy's Hunter-class frigates.

Defence's Capability Acquisition and Sustainment Group's First Assistant Secretary Ships, Sheryl Lutz, said that five prototype blocks would be built in the prototyping phase to test the shipyard's production systems, develop the facilities and ensure that the workforce was trained and ready to build the Hunter-class frigates.

"Nine of the world's most advanced anti-submarine warfare frigates will be constructed in Australia and the prototyping phase marks the beginning of a decades-long program which will be the cornerstone of continuous naval shipbuilding in Australia," Ms Lutz said.

"The Osborne shipyard is a world-leading shipyard which will enable Australian industry do its job constructing this advanced fleet of frigates for the nation.



NUSHIP *Supply* arriving at her home port, Fleet Base East, on Friday 15 January
(RAN photograph)

“Raising the capability of Australia’s shipbuilding industry is central to the National Naval Shipbuilding Enterprise as we continue to develop a truly sovereign maritime industrial base.”

Ms Lutz said that the prototyping phase of the Hunter-class frigate program would end in 2023.

“The actual construction phase of the Hunter-class program is scheduled to commence by the end of 2022, with prime contractor BAE Systems Maritime Australia, a subsidiary of BAE Systems, already supporting Australian jobs,” Ms Lutz said.

Collins-class Submarines to receive Sonar Upgrades

The Collins-class submarines will undergo significant upgrades to sonar systems here in Australia through a multi-million-dollar contract with Thales Australia announced on 29 December 2020.

The two contracts, worth around \$23.7 million, are for the design and implementation of the Mine and Obstacle Avoidance System and the High Frequency Intercept Array for the submarine fleet.

The upgrades will not only enhance the capability of the Collins-class fleet, but will provide a boost to Australian Defence industry and support Australian jobs.

The Minister for Defence, Senator the Hon. Linda Reynolds CSC, said that both the Mine and Obstacle Avoidance System and High Frequency Intercept Array are important parts of the upgrades to the Collins-class sonar system.

“Our six Collins-class submarines are highly-capable and regionally-superior vessels which are only halfway through their operational life,” Minister Reynolds said.

“To ensure that this capability maintains its edge, we are upgrading and improving its systems including through sonar upgrades.

“The purpose of a Mine and Obstacle Avoidance System is to acoustically detect obstacles, including mines, which pose a threat to the submarine. The High Frequency Intercept Array detects high-frequency noises including sonar transmissions.

“With more than 20 years of investment in Australia by Thales and Defence, these upgrades will complement broader improvements to the sonar capability of the Collins class, ensuring the regional superiority of the fleet into the future.

“We have a Collins-class submarine that is now exceeding the Royal Australian Navy’s availability requirement,” The Minister said.

The Minister for Defence Industry, the Hon. Melissa Price MP, said that Thales had extensive experience working on the Collins fleet, and other Australian-based companies would be engaged throughout the contracts.

“These contracts will include about 80 per cent of work being completed by Australian industry,” Minister Price said.

“We can expect these contracts to support 30 new jobs with Thales Australia in Rydalmere, NSW and additional jobs along the supply chain — jobs which, will continue throughout the contracts.

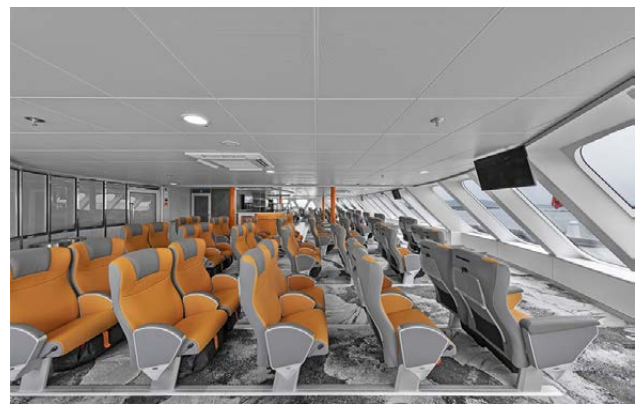
Austal Vietnam Delivery for Trinidad and Tobago

Austal Vietnam has delivered the first vessel fully constructed at the Vung Tau shipyard, the 94 m high-speed catamaran *A.P.T. James* for the National Infrastructure Development Company (NIDCo) of Trinidad and Tobago.

The Auto Express 94 vehicle-passenger ferry was designed at Austal Australia and features the company’s signature raked bow and optimised hull design which will transform maritime transport services on the Trinidad and Tobago ‘sea-bridge’ route between the islands of Trinidad and Tobago.



A.P.T. James, a 94 m high-speed catamaran ferry recently delivered by Austal Vietnam
(Photo courtesy Austal)



Passenger accommodation on *A.P.T. James*
(Photo courtesy Austal)

Austal’s Chief Executive Officer, David Singleton, said that the delivery of the first major commercial vessel from the Austal Vietnam shipyard in less than two years since its opening was both a testament to the skill and determination of the local workforce, and demonstrated success of the company’s Australasian strategy.

“This is an outstanding achievement for both Austal Vietnam and the Austal Group as we continue to focus and consolidate our defence and commercial vessel capabilities in strategic locations throughout Australasia,” Mr Singleton said.

“Austal Vietnam is now clearly a valuable asset in our commercial vessel shipbuilding network, building upon and complementing the growing capability in the Philippines, while also freeing up capacity in our Australian shipyard for additional defence contracts for the Royal Australian Navy and export markets.

“Our sincere congratulations go to Prime Minister Keith Rowley and the National Infrastructure and Development Company of Trinidad and Tobago, the people of Trinidad and Tobago and, of course, our 450-strong team of shipbuilders in Vung Tau on the delivery of this impressive new ship.”

Austal’s Auto Express 94 is an all-aluminium high-speed catamaran with capacity for 926 passengers and 250 cars, travelling at speeds up to 37.5 kn. The ship features the very latest in Austal’s ‘smart ship’ technology, including an advanced motion-control system, to deliver a more comfortable and stable ride for passengers and crew.

A.P.T. James is named after the Tobago-born politician, best known as a fierce advocate for political, social and economic development in Tobago before and during his service on the Legislative Council of Trinidad and Tobago from 1946 to 1961.

Austal Vietnam is well advanced on the shipyard’s next project, a new 41 m high-speed catamaran ferry for SGTM of Mauritius, due for delivery in the first half of 2021.

High-speed Catamaran Ferry for Blue Sea Jet in China

Austal has announced that Aulong Shipbuilding, a joint venture between Austal and Jianglong Shipbuilding, in China, has delivered a 42 m, high-speed catamaran passenger ferry to repeat customer, Blue Sea Jet of China.

The new ferry, named *Xin Hai Chi*, was constructed at Aulong’s shipyard in Zhongshan City and is the third ship to be designed and constructed for Blue Sea Jet since 2016.



The new catamaran *Xin Hai Chi* for Blue Sea Jet
(Photo courtesy Aulong Shipbuilding)

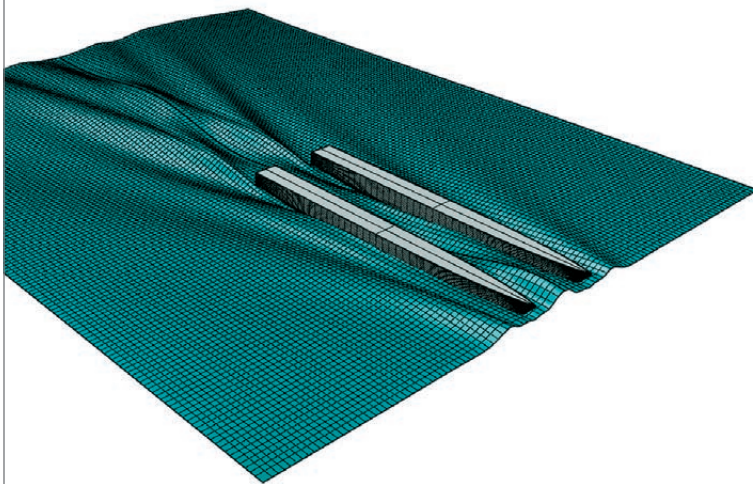
Austal’s Chief Executive Officer, David Singleton, said that the delivery of the third ship to Blue Sea Jet confirmed Aulong’s position as a preferred shipbuilder by China’s leading ferry operators.

“Aulong has quickly developed a strong reputation for delivering China’s best high-speed craft — drawing on Austal’s expertise in commercial ferry design and Jianglong’s local shipbuilding capability,” Mr Singleton said.

“Our congratulations to Blue Sea Jet on this latest addition to their growing, impressive fleet.”

Blue Sea Jet will operate *Xin Hai Chi*, which has capacity for 272 passengers over two decks, in the waters of the Dawan District between Guangdong, Hong Kong, and Macau.

Aulong Shipbuilding Co. Ltd (Aulong) is a joint venture between Guangdong Jianglong Shipbuilding Company



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(Jianglong Shipbuilding) of Zhuhai, China and Austal Limited. It was established in June 2016 with the aim of pursuing commercial passenger and non-military vessel opportunities in mainland China.

Austal (with 40% ownership) has licensed a number of its proven, commercial aluminium vessel designs for marketing throughout mainland China and construction at Jianglong Shipbuilding's established facilities in Guangdong province. Jianglong Shipbuilding brings local shipbuilding infrastructure, experience and expertise, with close to 1000 employees across two shipyards supporting the joint venture.

Austal USA Delivers the Future USS *Mobile*

Austal USA has delivered its 13th Independence-class Littoral Combat Ship (LCS) to the US Navy, from the company's shipyard in Mobile, Alabama.

The future USS *Mobile* (LCS 26) is the fourth ship delivered by Austal USA to the US Navy in 2020, following the delivery of USS *Kansas City* (LCS 22) in February, USS *Oakland* (LCS 24) in June and USNS *Newport* (EPF 12) in September.



The future USS *Mobile* (LCS26) is the 13th Independence-class Littoral Combat Ship to be delivered by Austal USA
(Photo courtesy Austal)

Austal's Chief Executive Officer, David Singleton, said that the delivery of the future USS *Mobile*, in Mobile, was a very fitting way to finish the year 2020.

"What better way to end this challenging year than with the delivery of the future USS *Mobile* in its namesake city. This ship is a fantastic tribute to the spirit and determination of the people of Austal USA and the City of Mobile," Mr Singleton said.

The Independence-class LCS is a fast, agile, mission-focused platform designed for operation in near-shore environments yet capable of open-ocean operation. It is designed to defeat asymmetric "anti-access" threats, such as mines, quiet diesel submarines and fast surface craft. The 127 m high-speed trimaran-hull warship integrates new technology and capability to support current and future mission capability from deep water to the littorals.

Four LCSs are presently under various stages of construction at Austal USA's Mobile, Alabama shipyard; assembly continues on the future USS *Savannah* (LCS 28) and USS *Canberra* (LCS 30), while modules for the future USS *Santa Barbara* (LCS 32) and USS *Augusta* (LCS 34) are under construction in the module manufacturing

facility (MMF). The future USS *Kingsville* (LSC 36) and USS *Pierre* (LCS 38) are under contract.

Austal USA is also under contract to build 14 Expeditionary Fast Transport vessels (EPF) for the US Navy, with 12 vessels delivered, an additional vessel under construction and one scheduled.

Haven from Incat Crowther

The team behind the World Superyacht Award-winning support vessel, *Hodor*, has unveiled a new COVID-19-inspired shadow vessel concept named *Haven*. Designed by Incat Crowther, the ShadowCat *Haven* is described as a "protective layer" to the owner's mothership. By acting as a buffer between the main yacht and the outside world, *Haven* allows owners and charterers to maintain COVID-secure social bubbles on board. The yacht will act as a COVID-19 testing facility and quarantine space before allowing guests and crew to proceed onto the mothership.

Key features include a hospital and laboratory, allowing the monitoring of all crew on board *Haven* and the mothership. This will ensure that the owner's crew only come into contact with tested *Haven* crew. All new crew and guests must pass through *Haven* for testing before boarding the mothership. As a result, the mothership will have no direct contact with the shore. All stores and transfers will be handled entirely by *Haven*.

The multihull design of the yacht allows *Haven* to operate in two zones contained in the separate hulls. The shore side will deal with any potential risk of infection, such as new guests, crew or stores. The yacht side, meanwhile, will remain tested and clean.

The shadow vessel will be equipped with all the latest COVID-19 testing equipment, as well as strategically-located thermal cameras to pick up any signs of infection.

Air conditioning and circulation systems will be combined with "nano-technological surfaces" which destroy viruses and bacteria.

Elsewhere, *Haven* will boast all the facilities expected of a capable support vessel, including storage for jetskis, tenders, a submarine, a diving centre and a decompression chamber. A helicopter landing deck and fuelling area are also found on board, as well as the option to add a dedicated hangar.



Starboard bow of *Haven*
(Image courtesy Incat Crowther)



Bird's-eye view of *Haven*
(Image courtesy Incat Crowther)


Other innovations include hydroponic gardens, research labs and offices for security and aviation staff.

Principal particulars of *Haven* are

Length OA	68.2 m
Length WL	65.7 m
Beam OA	15.5 m
Depth	6.00 m
Draft (propeller)	3.25 m
Crew and staff	52
Gross tonnage	2005
Tenders	1×13 m
	212 m
	2×7 m
	6×jetskis

Fuel oil	200 000 L
Fresh water	10 000 L
Main engines	2×MTU 16V4000 M73L SCR each 2832kW @ 2 050 rpm
Propulsion	2×propellers
Generators	2×Caterpillar
Speed (cruising)	12.5 kn
(maximum)	21.5 kn
Range	5500 n miles @ 12.5 kn
Construction	Marine-grade aluminium
Class/Survey	Lloyd's Register ✕100A1 SSC Support Catamaran HSC G6 ✕LMC Helicopter Landing Area, UMS

Stewart Marler



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Austal Launches VOLTA Series of Electric-powered High-speed Ferries

In January Austal Australia launched the VOLTA series of electric-powered high-speed ferry solutions, with the introduction of the Passenger Express 46V, a fully electric-powered 46 m catamaran ferry design.



Austal's VOLTA™ series of electric-powered high-speed craft has been launched with the Passenger Express 46V
(Image courtesy Austal)

Austal's new VOLTA series is distinct from existing electric-powered vessels in the marketplace by going beyond the replacement of diesel engines with an electric (battery) power plant, to offer a completely integrated design, construction and support solution — including on-shore charging infrastructure and in-service support programs for operators.

VOLTA-series vessels combine new light-weight low-resistance hullforms, specifically designed, tested and optimised for electric-power propulsion, with state-of-the-art lithium-ion batteries. Austal provides operators with a fully customised design and 'turnkey' solution, taking into account passenger numbers, vessel schedules and charging infrastructure.

Austal's Chief Executive Officer, Paddy Gregg, said that the new VOLTA series of high-speed ferries represents the future of commercial maritime transport, offering operators a cost-effective electric-powered vessel, capable of zero emissions, lower operating costs, a quieter and more comfortable ride, and outstanding reliability.

"For any high-speed vessel and, even more so for electric-powered ferries, optimising vessel mass and performance is essential — driving not just operating costs, but the size and upfront purchase cost of the batteries and the charging system.

"With Austal's unique VOLTA series of custom-designed and built vessels, customers may achieve a lower total cost of ownership without compromising on performance or capability. Operators can reliably and profitably sail on schedule all day, every day," Mr Gregg said.

"Austal's VOLTA series also future-proofs an operators' fleet by introducing environmentally-friendly 'green' technology which already meets widely-anticipated, low- or zero-emission targets for public transport vehicles and operators, worldwide."

Austal drew upon the company's own vast experience and expertise in innovative, high-speed craft design, construction

and support — and collaborated with industry-leading electric-technology partners from around the world — to develop the VOLTA series of electric-powered ferries over the past two years.

The first-of-class, 46 m Passenger Express 46V is a high-speed passenger ferry, designed to provide an environmentally friendly economical vessel ideal for metropolitan, inland waterway commuter ferry services. Boasting a capacity of up to 450 passengers, a maximum speed of 25 kn and fast charging capability, with a range of over 175 n miles per day, the Passenger Express 46V highlights the real advantages of the VOLTA design technology.

The vessel's striking modern design features a natural, light-filled interior enabled by large, panoramic windows and generous skylights positioned along the entire length of the cabin. Double automatic-sliding external doors provide direct, easy access to the passenger deck for fast passenger turnarounds which match or better the succinct battery-charging times offered by the fully-integrated shore-based battery-charging infrastructure.

Austal plans to expand the VOLTA series through the development of additional models for both commercial and defence applications, including autonomous vessels, and continue research and development into emerging propulsion technology to deliver zero-emission marine solutions globally.

Principal Particulars

Length OA	46 m
Beam	12.3 m
Draft	< 2 m

Propulsion

2 × Full electric, permanent magnet motors
2 × FPP, or CPP propellers (Waterjet or Azimuth also available)

Batteries

Full redundancy with two lithium-ion battery banks (one in each hull)

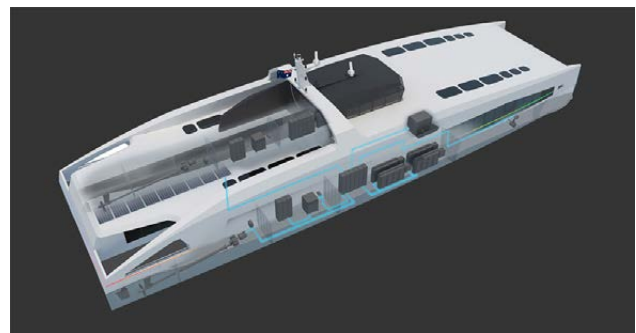
Minimum battery life of seven years

Payload and Capacities

Passengers	400 to 450
Bicycles	10
Crew	3

Performance

Operating speed	20 kn
Maximum speed	>25 kn
Maximum range	>175 n miles per day with 20% reserve



A view of the new ferry design showing the electrical installation
(Image courtesy Austal)

AGM Michell and the Tilting-pad Thrust Bearing

Stephen Phillip

This article is an excerpt from my book, Phillip, S. (2020), What Came out of the Box — a Biography of AGM Michell, Tellwell Talent, Victoria BC, Canada.

In the first decade of the twentieth century, the world's shipbuilding industry found itself in a crisis. The powerful steam turbine engine was gradually replacing the piston engine, and propeller designs were becoming increasingly efficient. However, ships also require a special bearing to transfer the enormous thrust generated by a propeller to the ship's hull. Existing designs of these thrust bearings were hopelessly inadequate and prone to catastrophic mechanical failure. This technological problem was causing terrible difficulties and appeared to be unsolvable.

The severity of this situation was particularly acute in Australia; separated by vast distances from England and Europe, it was heavily reliant upon shipping for both the export of raw goods such as meat and wool, and the import of finished goods including machinery. It is therefore entirely appropriate that the solution, an entirely new concept in marine thrust bearing, was developed by the young Australian engineer Anthony George Maldon (A.G.M.) Michell. Michell was a world expert in hydraulics and a prolific inventor whose creations, of which the tilting-pad thrust bearing is only one, revolutionised the world of industry and engineering. He possessed the rare quality of having both a keen mind for the theoretical aspects of engineering, and the practical skills with which to make working products based on the theory.



A.G.M. Michell
(Photo from [4])

A.G.M. Michell was born at Islington, London, in 1870 while his family were visiting England. The family returned to their home in Maldon, a small gold-rush town in the colony of Victoria and spent his early years there. From an early age he preferred to use the name George. He studied engineering at the University of Melbourne, completing a Bachelor of Engineering degree in 1895 and a Master of

Engineering degree four years later. He became established as a consulting hydraulic engineer, and made significant contributions to the numerous irrigation projects being implemented along the Murray River.

The Victorian State Rivers and Water Supply Commission issued tenders for the supply of machinery for these projects. The Victorian State Government funded the projects, and stipulated that the equipment should be manufactured in Australia whenever possible [1]. There were some who believed that there was not sufficient engineering capability or manufacturing resource in the country to satisfy this requirement; however, these sceptics were quickly proved wrong.

The configuration of a typical pumping installation consisted of a boiler, a steam engine, and a water pump. The boiler produced high pressure steam to power the engine, which was directly coupled to the pump. Thompsons Co., based in Castlemaine, supplied the boilers and steam engines. The boilers were designed to run on wood fuel, and logs of Murray Pine or Red Gum were typically used because they were in abundant supply in the districts along the river. The steam engines were of the high-speed triple-expansion type, the first such engines to be made in Australia. Weymouth Co., based in Richmond, supplied the water pumps. Michell was the company's engineering consultant and provided valuable technical advice on the design and construction of high-flow centrifugal pumps.

By his early thirties George had already created three new inventions: a regenerative pump, a cross-flow turbine, and a water meter. This remarkable achievement is a testament to his creative mind. These devices were produced in large quantities by several Victorian engineering companies.

Michell's most significant invention was the tilting-pad thrust bearing. He became aware of the serious deficiencies of existing thrust bearings through his extensive experience with water pumps and turbines, which require a bearing to absorb the thrust developed along the length of the shaft when in operation.

The existing bearing designs consisted of a large number of flat collars attached to the rotating shaft which made contact with fixed plane shoes. When a load was applied to these bearings the lubricant between the rotating collars and stationary shoes was squeezed out, allowing these parts to come into direct contact. As a result of this, the bearings experienced high friction, causing them to overheat and eventually seize.

Michell disliked inefficiency and became convinced that a superior design of thrust bearing should be possible by the application of lubrication theory. The creation of the modern

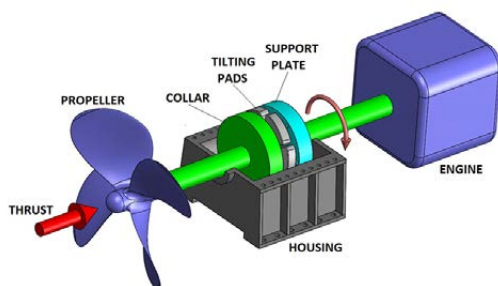
thrust bearing originated with a study of journal bearings. A journal bearing is the simplest type of bearing, and consists of a support block with a hole through the centre, into which a shaft is placed. The gap between the rotating shaft and the stationary block is filled with lubricating oil.

In 1884 Beauchamp Tower had conducted an extensive experimental investigation of journal bearings. He documented the operating performance of various configurations and determined that some performed much better than others. Two years later, Osborne Reynolds published a technical paper, *On the Theory of Lubrication and its Application to Mr Beauchamp Tower's Experiments* [2]. Reynolds' paper contained a mathematical analysis of the lubrication of a journal bearing, and was able to explain Tower's experimental observations. It concluded that bearings are able to sustain considerable loads only if the lubricating oil between the rotating shaft and stationary housing is able to take on the shape of a tapered wedge. The pressure developed in the wedge of oil supports the load and prevents the shaft from contacting the housing.

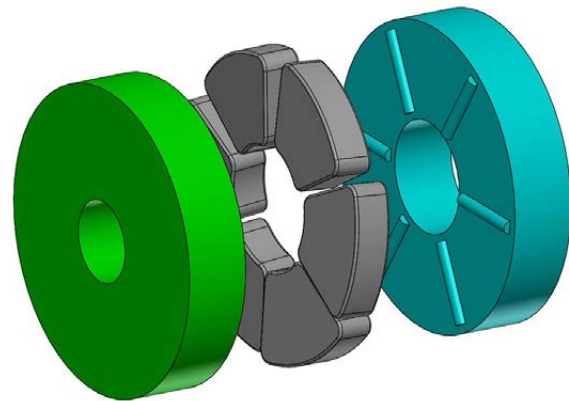
When Michell read Reynolds' paper he realised that he could invent a new configuration of thrust bearing which utilised the principle of a tapered wedge of oil. To achieve this configuration, he arranged a number of sector-shaped pads in a ring around the shaft. Each pad is stationary relative to the collar which is attached to the rotating shaft, and rests on a support on which it can pivot. The pads are therefore able to tilt at a small angle relative to the collar. The whole assembly is enclosed in a housing filled with oil.

When the bearing is set in motion, the pads pivot on their support so that the gap at the front (leading edge) is larger than the gap at the rear (trailing edge). This forms a wedge shape filled with oil between the pads and the collar. For the bearing to work properly a continuous supply of oil is required at the front edge of each pad.

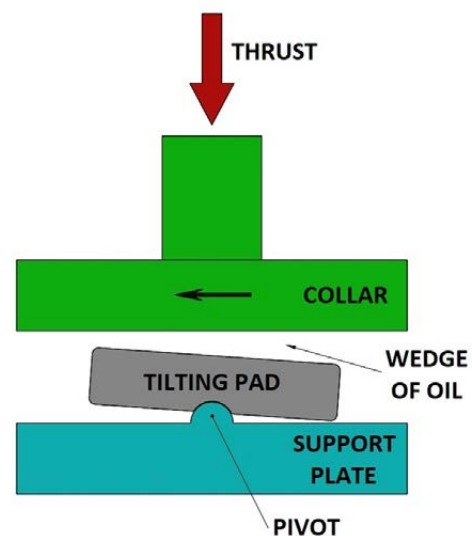
In tackling the problem of the thrust bearing, Michell employed the same methodical process which he used to solve all of his technical challenges. First, he conceived the general physical layout of the bearing. He then developed a mathematical model of it, and derived the equations which defined its operating capabilities. Finally, he constructed a prototype and conducted experiments on it to verify that the performance matched the theory.



Thrust bearing in the ship propulsion train
(Image courtesy Stephen Phillip)



Exploded view of the Michell thrust bearing
(Image courtesy Stephen Phillip)



Side view of the Michell thrust bearing
(Image courtesy Stephen Phillip)

Michell developed equations for both the total thrust load and the effective coefficient of friction [3]:

$$\text{Total thrust per unit area} = \frac{k \mu U}{\alpha^2}$$

$$\text{Coefficient of friction} = m\alpha$$

where μ = dynamic viscosity of the oil

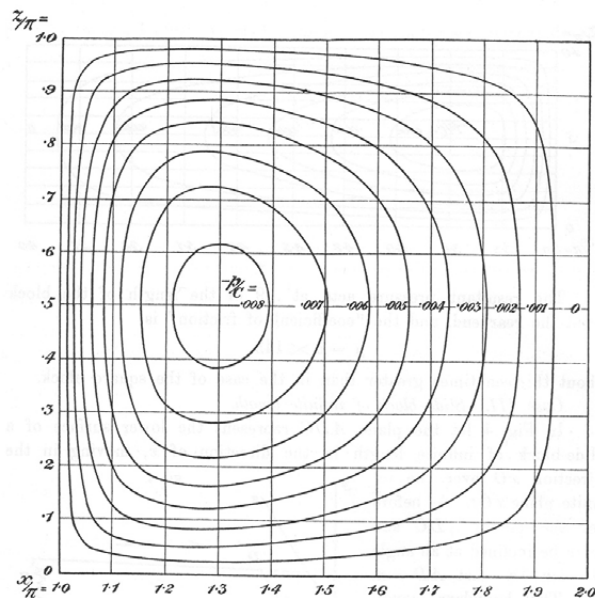
U = velocity of motion of collar relative to the pads

α = angle of tilt between collar and pads

k and m are constants whose value depends on the ratio between the length and width of the pads

He obtained solutions for four specific cases:

1. a square pad;
2. a pad of length three times its width;
3. a pad of infinite length; and
4. a pad of infinite width.



Pressure distribution under a square pad
as calculated and drawn by Michell
(Drawing from [3])

For practical bearings Michell preferred pads with width approximately equal to length which, according to his calculations, were able to carry 42% of the thrust compared to the 'ideal case' (pads of infinite width). He calculated the load which his new bearing could support and its frictional losses and, compared to existing bearings, found that it could support 10 times the load with 1/20 of the frictional loss.

Using the mathematical model he had developed, Michell was also able to determine the location of the centre of pressure over the surface of the pad. He pivoted the pad at this location so that the angle of tilt was able to automatically adjust according to the load applied to the bearing.

In 1905 Michell obtained British and Australian patents for his new tilting-pad thrust bearing. He did not obtain a US patent, a mistake that he came to regret in future years because the American engineer, Albert Kingsbury, subsequently invented and patented a similar product.

Michell wrote a technical paper, *The Lubrication of Plane Surfaces*, which described the configuration of the bearing and showed his derivation of the equations determining its operating performance. It was published in the journal *Zeitschrift für Mathematik und Physik* in 1905 [3].

In 1907 the world's first production Michell thrust bearings were installed in a number of new centrifugal water pumps at the pumping station in the Victorian town of Cohuna [4]. The pumps and bearings were manufactured by Weymouth Co. Michell journeyed to Cohuna to supervise the installing and commissioning of the new pumps and their novel new bearings. They were a complete success when put into operation. When one of them was dismantled and inspected after having been in service for a year, there was no evidence of any wear.

The fortunes of the Michell tilting-pad thrust bearing took a remarkable turn when George became acquainted with the brothers Henry and William Newbigin. Born in the town of Alnwick, England, both brothers had moved to Newcastle-on-Tyne when they began their careers. William was

employed by the steam turbine company, Parsons and Co., where he had completed an engineering apprenticeship. He subsequently re-located to Melbourne as the representative for Parsons, to pursue business opportunities in Australia. George met William at several meetings of the Victorian Institute of Engineers and told him about his new thrust bearing.

William passed this information on to his older brother Henry, a consulting civil engineer working in Newcastle-on-Tyne. He was immediately interested, because he had witnessed frequent breakdowns of pumping machinery in the local coal mines, most of which were caused by failure of their thrust bearings. Henry could see that, in addition to solving this immediate problem, there was enormous business potential for the Michell bearing in other applications. He wrote to Michell and offered to become his representative in Britain and Europe, which Michell gladly accepted, so they established a business partnership.

The bearing soon became very popular in land-based applications. Within five years, Michell and Newbigin had signed manufacturing license agreements with 70 companies in 14 countries, including 38 in the UK and 11 in France. Three Australian companies had also taken out manufacturing licences: John Walker and Co., Poole and Steel, and Thompson and Co. [5].

Michell and Newbigin were also keen to access the lucrative shipbuilding industry. It was known to be a tightly-knit community, so Newbigin sought the assistance of his friend G.B. Woodruff who was a marine engineer. On 12 October 1908, Woodruff delivered a lecture to the Institute of Marine Engineers in London, in which he described the Michell thrust bearing. This was the first public account of the bearing in Britain.

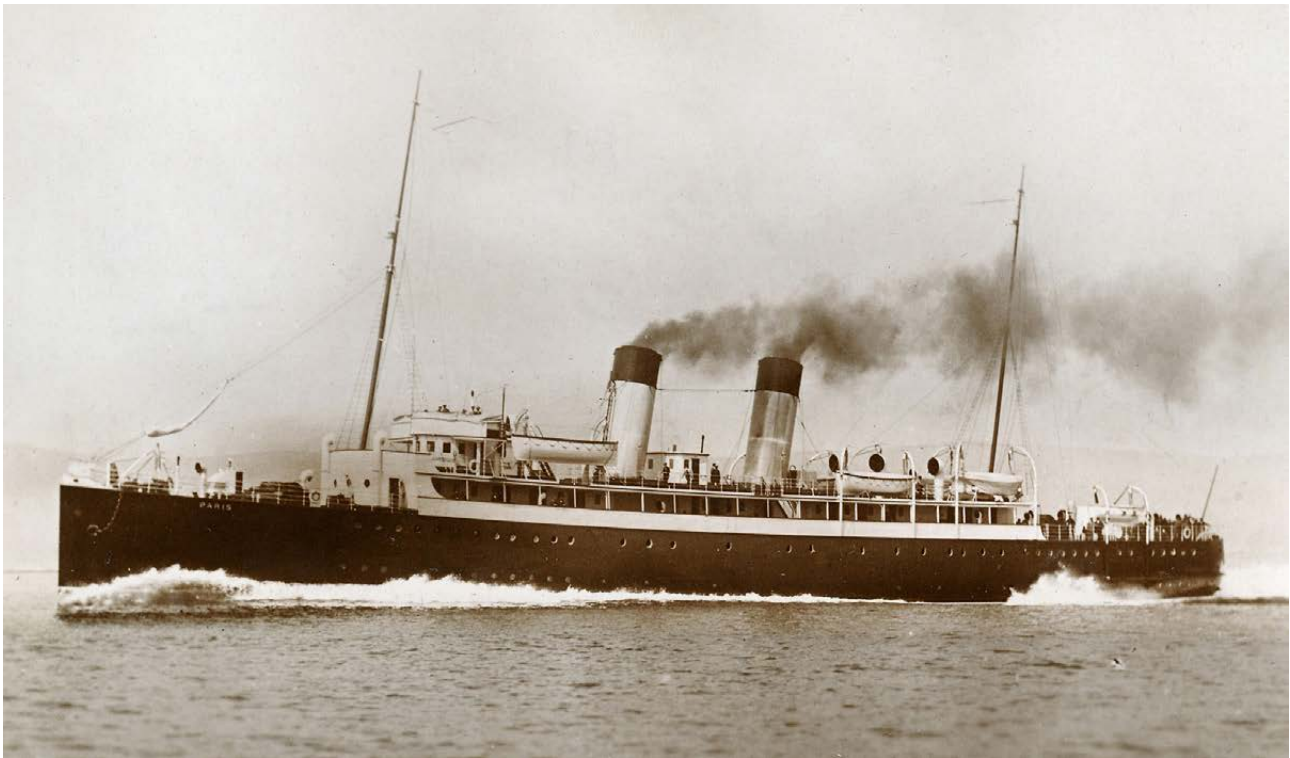
The potential application to ship propulsion remained elusive for many years, because the highly-conservative marine engineers were reluctant to try such an innovative product. They could not believe that the 'ridiculously small' device could sustain such high loads and, indeed, a leading British engineer of the time scoffed that 'Even if it is successful, I cannot see any field for it.'

The geared turbine was developed for ship propulsion to address the very high operating speed of the steam turbine, which is one of its fundamental operating parameters. It contains a gearbox between the turbine and the propeller, which reduces the high speed of the turbine to a speed more appropriate for the propeller, and is 15% more efficient than a direct-drive turbine.

Unlike a piston engine, the geared turbine produces a constant thrust (no pulsations or fluctuations). When applied to a conventional thrust bearing, this relentlessly squeezed the lubricating oil out from the gap between the shoe and collar, allowing the two metal surfaces to come into direct contact. One naval engineer of the time described the resulting unpleasant situation as 'an orgy of frictional destruction'.

Marine engineers began an urgent search for an answer to this problem. Ironically the perfect solution, Michell's tilting-pad thrust bearing, had already been available for several years.

Parsons and Co. had by now conducted numerous



TSS *Paris*
(Photo from Simplon Postcards website)

experiments over several years on applying the Michell thrust bearing to ship propulsion [6]. These extensive tests were well documented and, together with Parson's strong reputation within the shipbuilding industry, provided compelling evidence to marine engineers.

The breakthrough finally occurred in July 1913, when the cross-channel steamer TSS *Paris* became the first ship in the world to be fitted with the Michell thrust bearing. Built by the shipbuilding firm Denny of Dumbarton, the ship was powered by two geared turbines, each of 10 000 hp (7457 kW), and had a top speed of 23 kn. Each propeller generated a thrust of 24 tons (240 kN) which was supported by a single Michell thrust bearing.

The sea trials of *Paris* were so successful that, within a year, Michell's bearing was universally specified on all new ships built in British shipyards, including those for the Royal Navy. Many British shipbuilding companies took out a manufacturing licence for the thrust bearing.

The first Royal Navy ships to be equipped with the bearing were the two destroyers, HMS *Leonidas* and HMS *Lucifer*, both built by the firm Palmers of Jarrow. These also happened to be the first destroyers to be powered by geared turbines, which were supplied by Parsons. *Leonidas* was launched in October 1913, and *Lucifer* was launched two months later.

Vice-Admiral Sir George Goodwin, Engineer-in-Chief of the Royal Navy, said of the Michell bearing 'The true principles of lubrication, so long known but not utilised, have now been applied in a manner which can properly be described as revolutionary. The practical solution of the problem has been effected by Mr Michell in no uncertain manner and it has been adopted unreservedly in the Navy with complete success' [7].

The enormous success of the tilting-pad thrust bearing catapulted Michell to world fame. His elegant and

remarkable solution of the perplexing problem of thrust bearings ensured that, at least for a while, his name was well known in engineering circles.

During World War I the British Navy launched an enormous number of vessels, with a combined power of 10 million shaft hp (7.457 shaft GW), and all were fitted with the Michell thrust bearing. 280 destroyers were launched from British shipyards during the war period, as well as many other ships of various size and, by 1916, more than 800 Michell bearings had been fitted to Royal Navy ships.

In 1911 Michell developed a new configuration of journal bearing which utilises the tilting-pad principle. Unlike a conventional journal bearing, which consisted of two half shells clamped around the shaft, Michell's new design contained a number of pivoted pads arranged circumferentially around the shaft. As in the thrust bearing, each of these pads is pivoted and therefore able to tilt in order to establish a tapered wedge of oil which supports the applied radial load (compared to the axial load in the thrust bearing).

In 1919 Michell's thrust bearing patent was due to expire. He made a formal request to the British High Court of Justice for a time extension, citing the ship industry's long delay in adopting the bearing as a justification. Michell provided compelling evidence and the Royal Navy supplied an endorsement; as a result, a seven-year extension was granted.

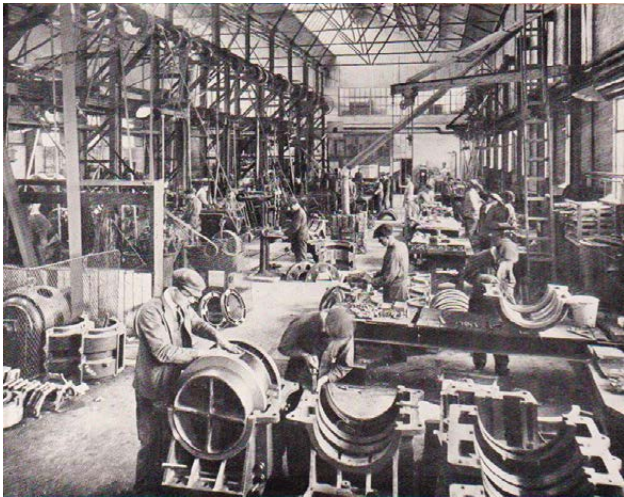
The following year, Michell and his business associate, Henry Newbiggin, established the Michell Bearing company. Four shipbuilding firms, Vickers Ltd, Cammell Laird & Co. Ltd, John Brown and Co. Ltd, and Fairfield Shipbuilding Ltd, each agreed to buy a share interest in the company. These four shipbuilding firms were already manufacturing the Michell bearing under license.

Michell Bearings commenced with a total capital of £50,000

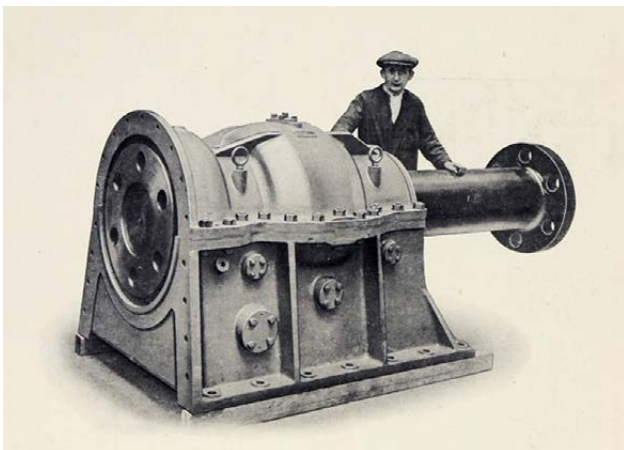
which was used to build a factory and undertake operations until sustainable sales revenue was established. A site in Newcastle-upon-Tyne was selected as the location for the factory. This was a logical choice because, at that time, the 15 mile (24 km) stretch of the River Tyne between South Shields and Scotswood was one of the world's major shipbuilding regions, with dozens of shipbuilding firms of various size [8].

The renowned marine engineer J. Hamilton Gibson had, for many years, been an ardent and vocal supporter of the Michell thrust bearing and delivered several lectures on the bearing, including one to the Institution of Naval Architects. He subsequently resigned from his position as Chief Engineer at Cammell Laird and joined Michell Bearings as Chief Design Engineer.

The Michell Bearings company began manufacturing large numbers of thrust bearings for use in marine and land-based applications. These were sold to all countries of the world except for those in North and South America, where Michell's rival, Kingsbury, sold thrust bearings under his own patent.



Michell Bearings factory in 1920s
(Photo courtesy Michell Bearings)



Michell thrust bearing Type C 1920s
(Photo from Graces Guide website)

Michell maintained an active interest in the welfare of the company which bore his name, but did not involve himself in its operations. He politely declined requests to assist with running the company, primarily because he did not consider himself a businessman. He believed that the main



Modern marine thrust bearing
(Photo courtesy Michell Bearings)

ongoing challenges for the company were to increase sales and consolidate the manufacturing process, and in neither of these did he consider himself an expert.

The Michell Bearings company is still in operation and remains one of the world's leading suppliers of tilting-pad thrust bearings. In 2020 the company celebrated the centenary of its founding.

Due to the vital importance of shipping in Britain, Michell was better known there than in his home country of Australia. A story, perhaps apocryphal but often told, relates to HMS *Hood* during her circumnavigation of the world from November 1923 to September 1924. Accompanied by HMS *Repulse* and vessels of the First Light Cruiser Squadron, HMS *Hood* undertook the 'Cruise of the Special Service Squadron', also known to the public as the 'Empire Cruise', which visited many foreign countries during its voyage of more than 38 150 n miles. One purpose of the trip was to visit the Dominions of the British Empire and remind them of their dependence upon British sea power. Upon arrival in Melbourne in March 1924, the ship was met by a welcoming committee of politicians, naval officers, and civic leaders. After the formal introductions, the ship's commander asked 'But where is Mr Michell? We've all been looking forward to meeting him.' An awkward silence followed, after which the leading official asked 'Who is Mr Michell?' [9].

In 1936 Michell initiated a concerted effort to replace the ball bearing with his tilting pad journal bearing. In a letter to H.B. Scott, General Manager of Michell Bearings, he stated that 'The defects and troubles of ball bearings are now becoming more notorious, and have impressed themselves on you and other engineers. To replace them with something better is fast becoming not merely an opportunity but an urgent call on us. I would go further and say that ball bearings are unsuitable for any application that can be classed as "engineering"' [10]. This campaign ultimately proved futile, as usage of the ball bearing had already become too well established.

For most of his adult life, George lived at his property *Monda* in the Melbourne suburb of Camberwell. He shared this large house with his brother John, and sisters Grace and Amelia. Behind the house, George had a well-equipped workshop,

in which he built and tested prototypes of his inventions. Michell had long wished to own a country property, so in 1911 he purchased several hundred acres of land near the town of Bunyip, located 50 miles (80 km) east of Melbourne. He called this property *Ruramihi*, which is Latin for ‘the fields of mine’, and on it he built a timber homestead. This country retreat became an integral part of his life and he spent many of his weekends there, as he considered it essential to his ‘mental health and comfort’.

George developed the property into a well-rounded and self-sufficient farm; he grew flax, planted a variety of Acacia trees, some of which were used to produce tan bark, and kept sheep and horses on the property. He became a keen orchardist, and established on the property a large orchard containing apple and pear trees.

In 1934 George was elected a Fellow of the Royal Society (FRS), London. His brother John had been elected a Fellow of the Royal Society in 1902.

In 1942 George was awarded the highly-prestigious James Watt International Gold Medal, which is given by the Institution of Mechanical Engineers for outstanding contributions to mechanical engineering. George was unable to attend the presentation ceremony in London as World War II was in progress; however, he was able to listen to a direct radio broadcast of the proceedings which had been specially arranged by the BBC [11]. In presenting the award, Professor Andrew Robertson, the Vice President of the Institution of Mechanical Engineers, said of the Michell bearing ‘Few inventions have provided so complete a solution to an engineering problem, and it belongs to that small class in which there is little scope left for further practical development.’ Indeed, the tilting-pad thrust bearings manufactured today are remarkably similar to Michell’s original design.

In 1950, at the age of 80, George completed his ‘magnum opus’, the textbook *Lubrication – its Principles and Practice*. Published by Blackie of London, it deals with the mathematics of fluid flow, lubrication of surfaces, and the practical application of lubrication theory to the design of machinery.

Michell died on 17 February 1959 at his home in Camberwell, in which he had lived for 62 years. He had accumulated a considerable wealth; his estate was valued for probate at £174,000 [12]. He never married and had no children.

T.M. Cherry, Professor of mathematics at the University of Melbourne, said of Michell ‘He had the introversion which is natural to a thinker, but he had also the positive feeling that adults should conform to serious standards and that, to be taken seriously, a man should pass the hard test of being completely sincere.’

A.J. Francis, Professor of civil engineering at the University of Melbourne, wrote ‘Rarely in the history of engineering can theory and practice have been so happily blended as in the person of Anthony George Maldon Michell. He wrote as he thought, with precision, clarity, and deep mathematical insight’ [13].

In 1964 a new building for Civil Engineering was officially opened at the University of Melbourne. Within this building is a laboratory devoted to the study of hydraulics, named

the ‘Michell Hydraulic Laboratory’ in honour of A.G.M. Michell.

To perpetuate the memory of Michell, the Mechanical College of Engineers Australia awards the A.G.M. Michell Medal each year. This award is presented for outstanding service to mechanical engineering. Professor John Crisp, who received the award in 1984, described Michell as ‘arguably Australia’s most versatile Engineer’ [14]. [*Naval architects who have won the medal include Tony Armstrong (the elder, in 2009), Chris Norman (2000), Phil Hercus (1992) and Tom Fink (honorary naval architect, in 1985)* — Ed.]

On occasion George used the motto ‘Theory is the captain, practice the soldiers’ which precisely and succinctly described George’s approach to tackling engineering problems.

Despite his achievements, Michell remained a genuinely modest man. His contributions, both theoretical and practical, remain a fascinating and vitally-important part of Australia’s engineering heritage.

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[Stephen Phillip is a mechanical engineer and lives in Melbourne. His fascination with Michell began while he was a student at the University of Melbourne. He was surprised to discover that a comprehensive biography of Michell did not exist, so decided to write one himself — Ed.]

Commemorating the Loss of HMAS *Perth* (I)

Michael Bailey, President

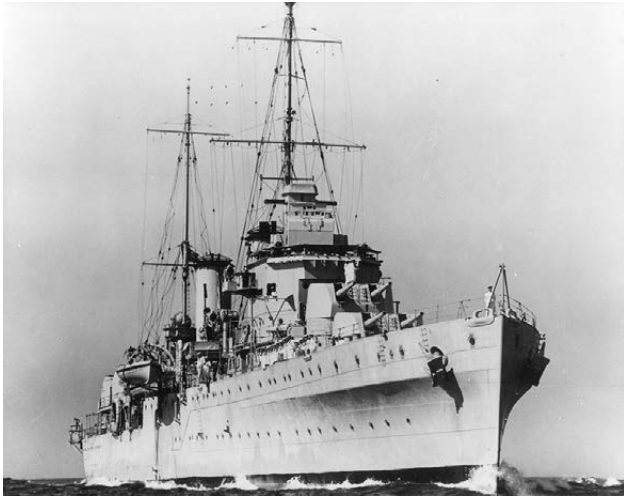
David Nicolson, Publicity Officer

HMAS *Perth* (I) Memorial Foundation Inc.

The cruiser HMAS *Perth*, the first of three Royal Australian Navy vessels to bear the name, was sunk on 1 March 1942 off the coast of Java by greatly-superior Japanese forces, together with the American cruiser USS *Houston*. The two ships had survived the Battle of the Java Sea, fought a few days earlier, which had claimed the main units of the combined American-British-Dutch-Australian (ABDA) Command force and were attempting to sail to Australia through the Sunda Strait when they ran into a Japanese invasion fleet heading for Java.

More than half the crew of 681, together with many American sailors, were killed in action on 1 March and the survivors endured terrible conditions on the Thai-Burma railway. Some survived a second sinking when their transport ships were torpedoed by US submarines, not knowing they carried POWs. Some were in the water for six days before rescue arrived.

Less than one-in-three of *Perth*'s crew returned to Australia and there is now just one survivor of the action.



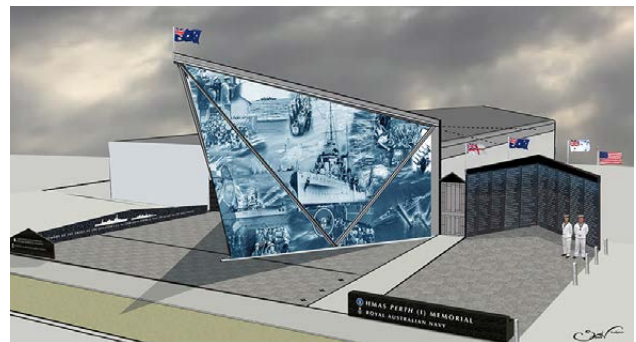
HMAS *Perth* (I)
(Photo courtesy Australian War Memorial)

Originally built for the Royal Navy in Portsmouth Royal Dockyard as the modified Leander-class cruiser HMS *Amphion*, the ship was commissioned into the Royal Australian Navy on 29 June 1939 and, in her wartime career, *Perth* saw action in the Atlantic, the Mediterranean, the Java Sea and the Sunda Strait. She supported the Royal Navy, allied ground forces in North Africa, Greece and Crete and, finally the ABDA combined fleet in South East Asia. A light cruiser of 6830 t displacement and 169 m length overall, she was armed with eight 6-inch (150 mm) and eight 4-inch (100 mm) guns, torpedoes and anti-aircraft mounts, and could steam in excess of 32 kn.

HMAS *Perth* (I) Memorial Foundation Inc. has been established to ensure the lasting memory of *Perth* and *Houston*. It is felt that the memorial will enhance the strong bond between Australia and the United States by remembering the men of USS *Houston* who fought together in the Sunda Strait. *Houston* lost 777 of her crew, killed in the action and in subsequent captivity, and only 291 returned home. The memorial panels will therefore feature images of *Houston* whose own Foundation is in total support of the project. Some members have voiced their interest in visiting the memorial once complete.

The Foundation proposes to develop an existing small facility located at Navy League headquarters in WA into a memorial which is fitting for the historic vessel. The location is also the home of TS *Perth*, Australian Navy Cadets, a youth training establishment located in East Fremantle. The inspirational values to be high lighted continue to be relevant.

This memorial will feature a ship's prow with two 10 m long ceramic glass walls incorporating images of *Perth* and her crew. This will be lit at night and will provide a permanent reminder of all those lost on that night, subsequently in captivity, and those who survived. All members of the ship's company on 1 March 1942 will be named on a granite wall of honour, and will be identified as RAN, RAAF (who maintained and flew the Walrus seaplane), or RN personnel of which five were serving and civilian canteen staff. It will play a significant part in Anzac- and Remembrance-Day services and will be a place for the families of those who did not return to reflect on the ultimate sacrifice made.



The proposed memorial designed by Smiths Sculptures
(Image courtesy Smiths Sculptures)

It is hoped that the memorial can be completed by the time of the 80th anniversary on 1 March 2022. This year, an exhibition is to be held in the City of Perth Town Hall from 27 February to 6 March.

Apart from a relatively small number of interested people, few are acquainted with the sacrifice of the Sunda Straits battle and a preceding action in the Java Sea. Many more have some knowledge of *Perth*'s sister ship, HMAS *Sydney*, lost a few months earlier. As Australia's greatest maritime disaster, the final resting place has been, until recently, unknown. This has possibly reduced focus on *Perth*, whose service record and battle honours are at least *Sydney*'s equal.

HMAS *Perth* (I) Memorial Foundation Inc. has engaged the services of Smith Sculptors due to their involvement in many iconic projects, including the HMAS *Sydney* memorial in Geraldton, the National Memorial to the Australian Army in Canberra, and the John Curtin statue in Fremantle, to name but a few.

The importance of reviving the memory of *Perth* and her crew has many sides. First and foremost, the operational record of the ship in support of allied navies, the protection of ground forces during hazardous evacuations, and the participation in fleet actions have seldom been surpassed by a light cruiser in any war. Fighting to the end against superior forces until ammunition had been expended was a painful outcome, now made worse by the continued desecration of

the war grave—much having been removed by scrap-metal dealers. This has been the unfortunate end for many of the naval wrecks in the South China Sea and provides even greater emphasis on preserving the memory of *Perth*.

For further information on the project, for Foundation membership, or for any offer of support, please contact the Secretary of the Foundation by emailing <secretary@hmasperth1memorial.com.au>.

THE PROFESSION

NSCV Watertight and Weathertight Integrity

AMSA has opened consultation on a new, more modern standard for watertight and weathertight integrity on domestic commercial vessels: National Standard for Commercial Vessels (NSCV), Part C: Design and Construction, Section C2: Watertight and weathertight integrity. This proposed change is likely to be of interest to boat designers, boat builders and naval architects, and some industry groups more broadly. We encourage you to share this message with interested parties.

Why we Need a New Standard

The requirements for watertight and weathertight integrity for domestic commercial vessels are currently spread across three technical standards contained in the Uniform Shipping Laws (USL) Code which were developed more than 40 years ago. Section C2 is a long-outstanding section of the NSCV which needs modernising.

The new standard updates the requirements for watertight and weathertight integrity to reflect current technologies and to align with international standards and best practice. It has been co-designed with the guidance of a technical advisory panel comprising accredited marine surveyors, representatives of industry associations, and educational institutions.

What we are proposing is a performance-based standard with multiple options to achieve compliance, and address a number of safety issues with the current requirements, including overloading.

Find out more about the proposed changes at www.amsa.gov.au/watertight-weathertight

Providing Feedback

Consultation is open from 18 January to 28 March 2021.

Email us at consultation@amsa.gov.au

Make an online submission at www.amsa.gov.au/watertight-weathertight

Call us 1800 627 484

Mail AMSA Consultation, GPO Box 2181,
Canberra ACT 2601

Ewen McCarroll

Technical Advisor

Australian Maritime Safety Authority

AMSA Bans *Barkly Pearl* from Australian Waters for 24 Months

The Australian Maritime Safety Authority has issued its most severe banning to date to the master and operator of the Marshall Islands-flagged livestock carrier, *Barkly Pearl*.

The Australian Naval Architect

The vessel was initially spotted on 3 November 2020 travelling through Australia's northern waters with a large hole in its hull. Due to concerns over the structural integrity of the vessel, the potential threat of pollution to the marine environment and the immediate risk to the seafarers' safety, AMSA issued an intervention direction instructing the vessel to the nearest safe harbour at Geraldton.

For two months, AMSA ship inspectors worked with the vessel owners and operators to develop an appropriate repair solution and, on 7 January 2021, *Barkly Pearl* was loaded onto MV *Falcon*, a semi-submersible heavy-load carrier to safely depart from Australian waters.



Barkly Pearl loading on board MV *Falcon*
(Image from AMSA website)

However, before the vessel could depart Australian waters, *Barkly Pearl* was issued with a refusal of access direction notice, under the Navigation Act 2012. AMSA's General Manager Operations, Allan Schwartz, said that this means *Barkly Pearl* is banned from entering or using an Australia port for 24 months.

This is a significant decision by AMSA. It is the first time a vessel has been banned from Australian ports for this length of time, and it will certainly affect the vessel's commercial operations.

The Australian community expects that any vessel operating or travelling through our waters is seaworthy. Consequently, when vessels are found to be so poorly maintained, AMSA will not hesitate to use the suite of powers available to it.

The owners and operators of *Barkly Pearl* were negligent in their maintenance of the vessel, put the lives of the seafarers on board at risk and posed an immediate threat to Australia's marine environment.

As a result, AMSA has determined that *Barkly Pearl* should be banned for two years.

AMSA would like to thank the Western Australian authorities, Mid West Ports and the residents of Geraldton for their patience during the two-month detention of *Barkly Pearl*.

AMSA News, 8 January 2021

Survey Matters

Survey Matters is AMSA's e-Newsletter relating to domestic commercial vessel (DCV) survey and is published approximately six times per year. You can request placement on the mailing list by emailing DCV Survey <dcvsurvey@amsa.gov.au>. The e-Newsletters (including December 2020) are now also available online at <https://www.amsa.gov.au/news-community/newsletters#collapseArea612>

Items included in the December 2020 e-Newsletter included:

- Application form updates
- Initial survey applications
- Surveying vessels >35 m
- Incomplete recommendations
- NSCV C1 — Arrangements accommodation and personal safety
- USL Code 5C & 5D — Watertight subdivisions
- NSCV F1 — Fast craft requirements
- Transitional vessels standards (Schedule 2 Table 1 MO503)
- NSCV Part B — General requirements
- Transitional survey requirements and certification
- Addition of active fin stabilisers
- MO503 Schedule 1 Clause 7 Change to vessel structure and watertight integrity
- Installation of hydraulic knuckle crane
- MO503 Schedule 1 clause 6 (f) — Removing repositioning, installing, cranes, net reels, tanks, etc.
- Lightship changes
- MO503 Schedule 1 Clause 6 (c) and/or (d) — Variation to displacement of at least 4% and/or LCG by at least 2%
- General requirements and reminders
- Progress
- Electrical plan approval requirements

The item on *Lightship Changes* is reproduced below.

Phil Helmore

Lightship Changes

MO503 Schedule 1 Clause 6 (c) and/or (d) — Variation to displacement of at least 4% and/or LCG by at least 2%. Lightship variations don't necessarily need an application for a new certificate of survey. This is because Section 9 (d) of MO503 requires only renewal type surveys for this change. Follow the process below during renewal survey when a vessel becomes transitional due to lightship changes only.

- Inform the owner that the vessel's lightship particulars have changed, and the vessel is now considered transitional. The vessel must be surveyed to the transitional standards mentioned in Schedule 2 of MO503. Explain that the change requires the vessel to undergo further surveys. The vessel will need to undergo a new stability assessment to the transitional standards. This may result in a change to the number of persons permitted on board the vessel.
- Email DCVApplications@amsa.gov.au to notify us of the change, including evidence that you've been engaged to conduct the survey(s). If the owner has applied to renew the certificate of survey, we will add a stability assessment to the application in MARS and provide you with the code. Let us know if you need any further codes created.
- Submit your survey reports and recommendations as normal when the additional survey activities are complete. You must also provide AMSA with a list of the applicable transitional standards the vessel has been surveyed against. Note: the AMSA 901 form contains a checklist for transitional vessel renewal surveys.

AMSA will assess the renewal application once we receive all the transitional survey reports. During assessment we will make any updates or changes to the person numbers from the new stability assessment. We will record the transitional standards that apply to the vessel in MARS. This will display on the certificate and future vessel reports.

Survey Matters, December 2020

THE INTERNET

RINA Webcasts

RINA has set up a YouTube channel and RINA webcasts can be viewed there. The RINA YouTube channel is at https://www.youtube.com/channel/UChb1sfHbWfQmG-iwpp_QGJg/videos

Bookmark this website and keep your eye on it!

Video recordings of presentations should be sent to Jaime Perez Martinez <jmartinez@rina.org.uk> at RINA HQ for uploading.

Branch and Section presentations are shown second from left in the top line. Click on *View full Playlist* to see the list, or click on the search function to the right of *About* in the menu bar, type the title of the presentation you are looking for (or at least the first few words thereof) and press Enter.

ACT Section Webcast

The ACT Section webcast recorded and uploaded within the last three months is:

February 2021

- *Design for the Mind* presented by Joakim Trygg Mansson, Manager Compliance and Planning/Duty Harbour Master, Port Authority of New South Wales, as a webinar using the Zoom software platform on 8 December 2020.

Lily Webster

NSW Section Webcast

The NSW Section webcast recorded and uploaded within the last three months is:

- *Are Naval Architects More than Just Designers?* presented by Rob Gehling, Secretary, RINA Australian Division and Vice President, RINA Pacific Region, as a webinar using the Zoom software platform on 2 December 2020.

Further recordings of Section webcasts will be added to the RINA YouTube channel as they occur.

Phil Helmore

EDUCATION NEWS

Australian Maritime College

AMC Awarded Two National Defence Industry Prizes

The Australian Maritime College's strong engagement and ongoing partnership with Defence has been recognised with two accolades at the Defence Connect Australian Defence Industry Awards.

AMC was named Academic Institution of the Year, and its commercial arm AMC Search, won the Regional SME of the Year at an event live streamed from Sydney on 27 November 2020.

In addition, AMC Search was named a finalist in the category of Prime Contractor of the Year.

AMC Principal, Michael van Balen AO, was delighted to accept the two awards on behalf of the University of Tasmania's specialist maritime institute.

"We're very proud of the strong partnership we have built with defence and related industries over a long period of time," Mr van Balen said.

"To have that recognised nationally is a real credit to the individuals and teams who work together to bring the spirit of that partnership to life.

"Maintaining strong connections between academia, Defence and industry is essential as Australia progresses its goal to build a sovereign naval shipbuilding capability.

"AMC plays a key role in this plan by providing the education and training needed to build a pipeline of talented naval architects, engineers, management and logistics professionals. We are honoured to be recognised as Academic Institution of the Year for this service."

AMC Search won the category of Regional SME of the Year, recognising its expertise at delivering bespoke training solutions for a rapidly-expanding autonomous maritime systems capability in Defence.

This includes being awarded a three-year contract to deliver autonomous systems training to the Royal Australian Navy and for investing in innovative training software called ROMULUS which significantly improves training outcomes for defence trainees.



AMC Principal, Michael van Balen AO, and AMC Search Manager Defence and Autonomous Systems, Chris White
(Photo courtesy AMC)

UNSW Canberra

Further to the lengthy *Education News* article from UNSW Canberra in the November 2020 edition of *The ANA* regarding the building of a Naval Architecture degree program at UNSW Canberra, there is not a lot to add at present. If you missed it, then you may find it informative. It addressed, in part, the history of Naval Architecture at UNSW Sydney and, in part, the 'passing of the ball' to UNSW Canberra, the reasons why the Australian Defence Force Academy (ADFA) exists, and the role which UNSW Canberra plays in educating tomorrow's leaders of Defence. It also outlined and explained the vision we have for the new program, an aspiration to build a world's best practice Naval Architecture program at UNSW Canberra, and a desire for our distinction to have a grey-ship focus. This is in line with the Navy sponsorship of the program.

In reaching out to all who may see themselves as a stakeholder in our program, we have prepared a survey and have distributed it through the community but, in the event that we have not identified you or your organisation as a target recipient, and you would like to contribute to our success, please do not hesitate to contact me via email (w.smith@unsw.edu.au, or navarch@adfa.edu.au) or other means. We have received some responses and are awaiting others.

I reiterate what I said in November that 'our program has still to be taken through the University's Academic Board processes, so officially the NA program does not yet exist. Therefore, we cannot advertise for students yet. We are also not listed as an available program in the Universities Admission Centre (UAC) system yet. But all these things should be in place by mid-2021 and the first NA courses will be taught in 2022. We are working with purpose on the required Academic Board documentation, preparing to seek provisional accreditation of the program by Engineers Australia, and developing the design of and materials for the individual courses. We have much to do, but our track is set and we are building momentum.

A/Prof. Warren Smith

Naval Architecture Program Coordinator
School of Engineering and IT
UNSW Canberra

UNSW Sydney Undergraduate News

Graduates

One of the last two students to graduate from the naval architecture degree program at UNSW Sydney has completed the program requirements and graduated as follows:

Noor Fitri Binti Mahmood BE(Hons) Honours Class 2
Division 1, 16 December 2020

Graduates Employed

She is now employed by Sabrecraft Marine in Selangor, Malaysia, where she completed her industrial training. Congratulations, Fitri!

Post-graduate and Other News

Publications

Em/Prof. Lawry Doctors continues his research and has recently published the following papers:

Doctors, L.J., Optimization of Marine Vessels on the Basis of Tests on Model Series, *Journal of Marine Science and Technology*, v.25, Issue 3, pp 887–900, September 2020.

Doctors, L.J., Hydrodynamics of Transom-Stern Flaps for Planing Boats, *Ocean Engineering*, Article 107858, v. 216, 11 pp, November 2020.

Doctors, L.J., A Reanalysis of the Towing-Tank Data for the Performance of Prismatic Planing Boats, *Applied Ocean Research*, 19 pp (November 2020) [submitted for publication].

Chris Fell AO

Em/Prof. Chris Fell received the award of Officer in the General Division of the Order of Australia (AO) in the Australia Day honours list for distinguished service to science and engineering, particularly to nanotechnology research and fabrication, and to professional networks. This award added to his previous Member in the General Division (AM) award.

Senior naval architects will remember Chris as the Dean of Engineering and, eventually, Deputy Vice Chancellor of UNSW Sydney, from where he retired.

Phil Helmore

Future Shipbuilding Workforce to gain Industry Experience

It was announced on 10 December that more than 30 engineering students were to receive valuable work experience with Defence and some of Australia's largest shipbuilders after receiving Defence-funded naval shipbuilding scholarships.

The Minister for Defence Industry, the Hon. Melissa Price MP, congratulated defence industry partners for enabling the 32 undergraduates to get a taste of life in Australia's growing defence industry through the National Naval Shipbuilding Pipeline Scholarship.

Minister Price said that the Defence-funded pilot scholarship program, administered by the Naval Shipbuilding College, aimed to strengthen the pool of future engineering talent available for Australia's Naval Shipbuilding Enterprise.

"It's fantastic to see Defence and Industry pulling together in these challenging times to support placements for people who are keen to be involved in our national shipbuilding enterprise," Minister Price said.

"This is a terrific new program which will provide future workers with valuable, hands-on industry experience."

The scholarship supports a 12-week paid internship in Defence or a defence industry organisation, and is endorsed by Engineers Australia.

"Participants are studying the in-demand engineering disciplines that the enterprise requires, including computer and software systems, mechatronics and mechanical, electrical and electronic engineering," Minister Price said.

"Australia's National Naval Shipbuilding Enterprise will need more than 15 000 workers across the nation.

"We must equip our future workforce with the skills required for a long and successful career in the shipbuilding industry while they're still studying."

BAE Systems/ASC Shipbuilding, BOUW Ballistics, Cubic Defence Australia, DefendTex, Department of Defence, KBR, Laser Central, PHM Technology, Products for Industry, Protonautics, Raytheon and RUAG were all set to host students.

AMD Marine Consulting



www.amd.com.au



Path to a Career in Naval Shipbuilding

On 11 December the Naval Shipbuilding College released a catalogue of education and training courses to help job seekers secure employment in the growing shipbuilding sector.

The Minister for Defence Industry, the Hon. Melissa Price MP, said that the increasing list of shipbuilding and Defence-focused courses would provide direct pathways to thousands of job opportunities created by the Government's unprecedented naval investment.

"The new catalogue contains 80 short courses from 28 national education and training providers, including bridging and specialist courses," Minister Price said.

"It also includes 600 entry-level courses which are offered in universities or TAFEs in every state and territory.

"The Naval Shipbuilding College has worked with major shipbuilding contractors to align these courses with a range of job roles in the naval shipbuilding industry."

The Naval Shipbuilding College, established in 2018, provides jobseekers with tailored career and training advice.

This includes referrals to courses across an extensive national education and training provider network, with more than 900 jobseekers being referred to additional training.

States and Territories get Onboard

Every Australian state and territory is set to join forces with the Commonwealth Government to develop a skilled national naval shipbuilding workforce by signing cooperation agreements with the Government's Naval Shipbuilding College.

The cooperation agreements commit the states and territories to working with the Naval Shipbuilding College to establish and develop new workforce pipelines and ensure there are clear career pathways for jobseekers into the naval shipbuilding sector.

On 16 December the Minister for Defence Industry, the Hon. Melissa Price MP, said that the agreements supported a nation-wide effort to developing the future workforce by providing the education and training required to deliver a sovereign shipbuilding capability.

"A skilled and experienced workforce remains critical to the successful delivery of a new naval capability and the ongoing sustainability of the National Naval Shipbuilding Enterprise," Minister Price said.

"This is truly a national endeavour. All states and territories have an important role in supporting the success of the Enterprise through workforce development and skills growth.

"The Government is committed to growing the Australian Defence industry. It is expected that by 2030 the shipbuilding sector will support about 15 000 jobs across Australia."

South Australia, Western Australia, New South Wales, Northern Territory, Tasmania and Victoria have signed Cooperation Agreements, with the Australian Capital Territory and Queensland to follow.

The Naval Shipbuilding College is partnering with all levels of government, shipbuilding prime contractors, Australian

businesses, and education and training providers to help create a national shipbuilding workforce.

The College is headquartered in South Australia and, through a hub-and-spoke model, has national reach to ensure a coordinated approach to workforce development.

The College's establishment of a regional office in Western Australia, and the imminent opening of an office in New South Wales, will support its physical presence on the west and east coasts of Australia to streamline stakeholder engagement across the nation.

Digital Shipbuilding Course Graduates at Work

The Hunter-class frigate project continues to ramp up its Australian workforce, with the graduates of Australia's first digital shipbuilding course beginning work on the project.

The Diploma of Digital Technology, run by the prime contractor for the Hunter-class frigate project, BAE Systems Maritime Australia and Flinders University, was launched in March last year. The course has been training workers in the systems and processes required to build Navy's nine new anti-submarine warfare frigates.

On 28 January the Minister for Defence, Senator the Hon. Linda Reynolds CSC, said that important naval shipbuilding capability had been retained, with the graduates having a combined total of around 700 years of shipbuilding experience.

"All 51 students who completed the course were originally working on the air-warfare destroyer (AWD) project. They will now begin work on the Hunter-class project, with two students initially commencing on the offshore patrol vessel project," Minister Reynolds said.

"With the major milestone of commencement of prototyping reached in December last year, it is vital that we see continued growth in the shipbuilding workforce which will employ 15 000 personnel across Australia as part of this Government's \$183 billion Naval Shipbuilding Plan.

"Following the completion of this course, the graduates now have the required skills to work in our state-of-the-art digital shipyard facility at Osborne South in Adelaide.

"They can use their newly-gained digital skills to forge a new career path, with more than half being redeployed into engineering, project management and supply-chain roles on the Hunter-class project. The remainder will go into operations roles where they will put their new skills into practice on the shop floor."

Some 2500 direct jobs are expected to be created under the new frigate program.

The Minister for Education and Youth, the Hon. Alan Tudge MP, said that the course has been an important tool to upskill existing employees to ensure that Australia retains a skilled and experienced naval shipbuilding workforce.

"The course has allowed Flinders University to deliver skills which are directly relevant to the naval shipbuilding industry, and allowed students to undertake hands-on solutions in their workplace," Mr Tudge said.

"Less than a year after we launched the diploma, we have the first graduates applying their skills in the workforce."

INDUSTRY NEWS

Top Appointments at Naval Group Australia

On 11 January Naval Group announced the appointment of experienced board members and a new Chair, as Australia's Attack-class submarine program moves into a new phase.

Current Naval Group Australia board Director David Peever has also been appointed Chair to replace Jean-Michel Billig who relinquished his position as Chair after resigning as Executive Vice President of Naval Group's Future Submarines programme.

David Peever has a strong record of leadership in organisations including Rio Tinto and, in 2014, was Chair of the Commonwealth Government's First Principles Review Panel into Defence.

Mr Peever said that there was a significant growth period ahead for Naval Group Australia.

"The company has already made significant progress in Australia, rapidly increasing its workforce to more than 250 staff and demonstrating a commitment to local jobs in a wider supply chain which will support sovereign submarine construction over the coming decades," he said.

Former Capability Acquisition and Sustainment Group Deputy Secretary Kim Gillis, Thales Australia Chief Executive Officer, Chris Jenkins, and Naval Group Executive Vice-President Industry and Australian Future Submarine Program Director, Laurent Espinasse, have joined the Naval Group Australia board.

Naval Group Chief Executive Officer, Pierre-Eric Pommellet, said that the Australian Attack-class program was moving to a new phase, after the announcement of the first local manufacturing package worth almost \$900 million and with work underway to ready Adelaide's shipyards for submarine construction.

Naval Group Australia announces Local Jobs Package

In December Naval Group Australia launched a major new jobs package which targets workers ranging from office staff to engineers, as it aims to add 100 people by April and double its total South Australian-based workforce by the end of 2021.

The 'sub what you do' campaign will run across social and traditional media, and invites people to make the jump from their existing work to 'build a submarine instead'.

Naval Group Australia Chief Executive Officer, John Davis, said that the company was seeking a range of trade and professional skills as it geared up for the generational construction project, and that people who had never even considered a career in defence could make a difference.

"Designing and building Australia's 12 Attack-class submarines is one of the most significant undertakings in our nation's history," Mr Davis said.

"We need Australians from right across the country to 'sub what they do' and become part of delivering this unique and exciting capability to Australia.

"We are offering great jobs which will turn into remarkable careers.

Mr Davis said that people could use skills they already have, but build a submarine instead.

"You don't have to be a member of the armed forces, or someone wearing high vis," he said.

"We already employ everyone from apprentice welders and human resources professionals to computer software technicians and engineers. We have many of the functions that you would associate with any other business, plus the unmatched excitement of building a submarine."

"A graduate who joins this company fresh from training could spend their entire working life with Naval Group Australia, and retire as the 12th submarine goes to sea."

"We are working with the world's best technology and expertise, gathered from 100 years of submarine building in France, to deliver a regionally-superior submarine fleet which will defend our island nation for decades to come.

Naval Group Australia currently employs more than 250 people at its Keswick and Port Adelaide offices. That is expected to increase by around 100 by April, with a target to reach a total of more than 500 workers by the end of 2021.

Naval Group Australia expects to employ 1700 people directly by 2028 and support hundreds more jobs in the new advanced-manufacturing supply chain that is being created to construct the nation's 12 new Attack-class submarines.

In 2021, Naval Group Australia will invite new applications across a range of areas including software developers and cyber security, drafters, welders, ICT professionals, fabrication supervisors, procurement, legal, commercial and finance professionals as well as engineers specialising in the fields of electrical, mechanical, production and integrated logistics support.

Raytheon Contract for OPV Management

The Commonwealth Government announced in December that Raytheon Australia had been selected as the Capability Life Cycle Manager to initially help support the transition into service for the Arafura-class offshore patrol vessels, while setting the foundations for through life asset management.

The first two Arafura-class OPVs are currently under construction at Osborne in South Australia, while the remaining 10 vessels will be built at Henderson in Western Australia, where the first two are under construction. The Minister for Defence, Senator the Hon. Linda Reynolds CSC, said that this was a significant step in the development of a dynamic local industry model to manage Navy's continuous shipbuilding program.

"Today's announcement is all about jobs and backing Australian industry as the economy continues to recover from COVID-19," Minister Reynolds said.

"Capability Life Cycle Managers will drive and maximise opportunities for Australian workforce and Australian industry in the delivery of services under the new contract, making domestic sourcing recommendations and promoting Australian industry development.

"As the Capability Life Cycle Manager for OPVs, Raytheon

Australia will work hand-in-hand with the Henderson-based OPV Systems Program Office and the shipbuilding team, ship designer and a network of regional maintenance providers at OPV homeports to deliver an effective transition into service and through-life support arrangements.

The Minister for Defence Industry, the Hon. Melissa Price MP, said that Australian businesses in Cairns and Darwin would substantially benefit from the Government's investment in the years ahead.

"Cairns and Darwin are booming defence industry hubs and will play a critical role in the maintenance of these vessels which will keep Australia's borders safe," Minister Price said.

"This program will deliver new opportunities for Australian businesses across the north of Australia, creating Aussie jobs and delivering investment in local economies.

Austal Completes Acquisition of BSE Maritime Solutions

On 2 December 2020 Austal announced that it had completed the acquisition of the Australian-based BSE Maritime Solutions Group (BSE Maritime Solutions), announced on 23 October 2020.

The completion of the acquisition marks the start of the integration of the BSE Maritime Solutions business, a leading ship repair and support provider operating in Cairns and Brisbane, into Austal Australia's service-centre network and the Austal brand.

Current customers, including Australian Border Force, BAE Systems, Thales and Svitzer, will continue to be supported by the 60 permanent employees who have all been offered employment with Austal Australia, plus the existing Austal Cairns service centre team of more than 50 technicians, engineers and service personnel.

Austal's Chief Operating Officer, Patrick Gregg, said: "We are delighted to welcome the BSE Maritime Solutions team to Austal and the wealth of skills, experience, knowledge and enthusiasm which they individually and collectively bring to our growing service and support business.

"Austal's expanded dockyard and ship-lift facilities in Cairns, including the Pacific's largest mobile boat hoist, significantly enhances our in-service support capabilities for the growing number of Austal-designed and constructed Cape-class and Guardian-class patrol boats operating in the region, and positions the company well to pursue additional defence support contracts in the future," Mr Gregg added.

The newly expanded Austal Cairns Service Centre will continue to be managed locally by General Manager, Adrian Smith, reporting to Austal Australia's Head of In-Service Support, Mike Steen, who oversees the national in-service support operations in Henderson, Western Australia, Darwin, Northern Territory and Cairns, Queensland. Austal's new Brisbane team and facilities will be managed by the Austal Cairns Service Centre.

Australian Industry to deliver Attack-class Submarine Outboard Flank Array

The future submarine program continues to progress with the contract signing in December for the design of the primary underwater sensor of the submarine.

The contract has been signed with Thales UK Ltd, through Lockheed Martin Australia, for the design of the outboard flank array and partnering arrangements with Australian industry. The outboard flank array forms part of the sonar subsystem.

The Minister for Defence, Senator the Hon. Linda Reynolds CSC, said that the design of the outboard flank array is vital to the operational effectiveness of the Attack-class submarine and its regional superiority.

"Thales is a global leader in underwater systems and the world's top exporter of sonars and related systems for naval forces. This contract builds on the work Defence already has with Thales to upgrade the sonar suite of the Collins fleet," Minister Reynolds said.

"Following a competitive tendering process, Thales has committed to establishing the Australian industrial capability needed to support the sovereign build, operation and sustainment of the Attack-class submarine.



The BSE Maritime Solutions Cairns facility
(Photo courtesy Austal)

“This is a significant step in the right direction to build up Australian capability for the future submarine program, bringing together the best underwater sensing technology with local industry, that will ensure that we deliver a sovereign regionally-superior submarine.”

Thales will support and promote Australian industry capability by:

- Conducting a proportion of the design phase in Australia by engaging one of three Australian-based companies, Thales Australia, Babcock Australia, and BMT Group, through a competitive process.
- Leveraging existing in-country capabilities which support other Australian Defence Force assets, including the Collins-class submarine, for the assembly, integration and sustainment phases.
- Providing an industry development package for the transfer of industrial capability to Australia to enable the provision of critical sub-assemblies and line replaceable units for both initial supply and sustainment.

Following the successful completion of the design phase, further work will be contracted for the manufacture of the subsystem from 2023.

Dynamic Mooring Calculations on Supercomputer

Perth Hydro has completed a long-term dynamic mooring simulation for ships in Geraldton harbour, using one year of hourly-measured wave spectra within the harbour. The code *MoorMotions* was run as a coupled ship-and-harbour simulation to determine dynamic mooring-line loads, fender loads and six-degree-of-freedom ship motions.

Dynamic mooring simulations are very computationally intensive. This project would have taken approximately six months to run on a standard workstation. At the Pawsey Supercomputing Centre, it was run in a couple of days. Dr Andrew King of L&K Engineering assisted with compiling the code and running it on the Zeus cluster.

The simulations highlighted which wave conditions (in terms of swell and long waves) are the most dangerous for moored ships at each berth, and will assist the port with developing wave thresholds for the safe mooring of ships.

Tim Gourlay



Tim Gourlay (L) with Pawsey technician, Daniel Grimwood, at the Pawsey Supercomputing Centre in Perth
(Photo courtesy Gino Parisella)

Sea Boat Contract for Sydney Company

Sydney-based company Britton Maritime Systems has been awarded a \$9 million contract to build 12 Gemini sea boats for the RAN's new evolved Cape-class patrol boats.

The Minister for Defence, Senator the Hon. Linda Reynolds CSC, said that the contract demonstrates the Government's commitment to supporting Australian industry and Australian jobs.

“The Gemini are specifically designed for the Cape-class vessels, and are already in operation with the current Navy Cape-class patrol boats,” Minister Reynolds said.

“The sea boats are the primary mission system for the patrol boats, providing an insertion capability for boarding and landing parties in support of operational requirements.

“Two sea boats will be delivered and fitted to each of the six new Cape-class patrol boats currently under construction by Austal in Western Australia.”

Improved Ship Fire Protection on the way

Non-combustible panelling which can withstand temperatures up to 1000° C is set to be installed in Navy vessels.

Hobart company CBG Systems developed the potentially life-saving marine structural fire protection system in partnership with the CSIRO.

The panelling weighs about half as much as traditional metal panelling and is stronger than intumescent coatings, which are generally used for fire protection.

CBG's Managing Director, Javier Herbon, said that the technology had the potential to increase the overall efficiency of ships as well as having possible applications in the aerospace sector.

CBG Systems specialises in fire, thermal and acoustic insulation, as well as specialist antenna systems.

The company's products have been installed on more than 90% of the world's high-speed ferries and most of the Navy's major vessels.

The company is now preparing to equip Australia's newest, cutting-edge naval vessels with its life-saving products.

Mr Herbon said that he attributed the company's success to a continuous innovation strategy, through which the world's lightest and most effective fire-protection system had been produced.

“As a business, we are making adjustments in preparation for work on the National Naval Shipbuilding Enterprise,” Mr Herbon said.

“The enterprise represents an enormous once-in-a-lifetime opportunity to grow our business.

“Upskilling our workforce, strengthening our training practices, investing in research and development, and partnering with like-minded organisations are just some of the activities taking place behind the scenes at CBG Systems.

“Our objective has always been to offer premium safety, better durability and reliability.”

Government to cut Red Tape

On 4 December the Minister for Defence Industry, the Hon. Melissa Price MP, unveiled new plans to cut red tape with the release of the Terms of Reference for a comprehensive review of Defence procurement.

The review of the Australian Standard for Defence Contracting (ASDEFCON) and Defence Procurement will seek to strengthen the way Defence does business with defence industry and ensure that it has a fit-for-purpose procurement system in place.

Minister Price said that the review was timely as the Government continued to roll out \$270 billion in Defence capabilities over the next decade.

“Working to cut red tape is a key part of our ‘Five Pillars’ strategy to support defence industry through the COVID-19 challenges and beyond,” Minister Price said.

“It’s the result of our ongoing dialogue with the sector over many months designed to help them grow their business and deliver strong defence capability.

“By reviewing Defence’s suite of contracting templates, its procurement practices and processes, we can deliver a simpler and less-burdensome procurement system.”

Minister Price said that industry and stakeholders would be engaged and consulted as part of the strengthening of defence procurement.

“This is an opportunity for defence industry to put forward ideas, solutions and feedback to improve what is a critical system for Defence,” Minister Price said.

The goals of the ASDEFCON and Defence Procurement Review are to fully examine Defence industry’s views on how Defence approaches the market at all stages of a procurement process.

The review is expected to be finalised by mid-2021, with a summary of the key findings to be released after consideration by the Government.

Hybrid Solution selected for new Isle of Man Ferry

Wärtsilä is to supply a comprehensive range of solutions for a new 132 m long ro-pax ferry for the Isle of Man Steam Packet Co (IOMSP). The ship is being built at Hyundai Mipo Dockyard in Korea and will serve the Heysham, England, to Douglas, Isle of Man, route. The order with Wärtsilä was placed in the second quarter of 2020.

Wärtsilä has worked closely with the owner to develop a customised integrated solution based on the ship’s operating profile and customer-specific requirements. Reliability, efficiency, and low operating costs were key considerations. Central to the design is the Wärtsilä 31 engine, recognised by Guinness World Records as being the world’s most efficient 4-stroke diesel engine and an engine which can also utilise artificial intelligence and machine learning in a condition-based maintenance regime.

“We have selected Wärtsilä as their solution brings notable advantages in terms of system integration and operational optimisation. It will also have the flexibility to take advantage of alternative future fuels as they become available. Wärtsilä has the experience to deliver a state-



An impression of the new Isle of Man ferry
(Image courtesy Wärtsilä)

of-the-art bridge-to-propeller solution, along with the track record needed for this complex newbuild project,” said Jim Royston, Fleet Operations and Project Manager at IOMSP.

“The Hybrid solution, combining highly-efficient engines and energy storage, is increasingly being seen as a practical means for meeting today’s environmental and operating challenges. This solution lowers emission levels and extends the time between engine overhauls, and is an effective future-proof model for ship owners,” said Karl Hinks, Sales Manager, Wärtsilä Marine Power.

The Wärtsilä scope includes the Wärtsilä 31 engines, electrical and automation including Wärtsilä’s Low Loss Concept (LLC), the energy-storage system, and propulsion machinery including the transverse thrusters. Wärtsilä will also supply the latest NACOS Platinum integrated navigation system, along with a newly-developed ground-breaking Bridge Console Design and its Aquarius UV Ballast Water Management system. The equipment is scheduled for delivery to the yard during the latter part of 2021.

Wärtsilä Engines and Hybrid Systems for Eco-friendly Ferries

Wärtsilä has won the contract to supply the engines and a range of its electric solutions for two new ferries under construction at the China Merchants Jinling Shipyard (Weihai) in China. The ships are being built for Finnlines, a part of the Grimaldi Group, and are designed to incorporate the latest technical and environmental concepts. The order for the engines was placed in July 2020, with the remaining Wärtsilä equipment ordered in September 2020.

The two Superstar vessels will operate between Finland and Sweden across the Baltic Sea. They will feature Wärtsilä 46F main engines, thrusters, and a state-of-the-art electric package. This includes a hybrid shaft generator system comprising a fully-integrated Multidrive capable of driving the shaft generators in both directions as motors and/or generators. The package also includes the thruster control system, and a highly-efficient energy-management system for performance optimisation. This will enable the vessels to operate free of emissions on either batteries or shore power while in port.

“This investment is aimed at energy efficiency and emissions



The new Superstar Finnlines ferries will feature Wärtsilä engines and hybrid systems
(Image courtesy Finnlines)

reduction and is part of our intention to lead the development of energy-efficient transport services in the Baltic Sea region. We have Wärtsilä solutions in most of our ships, so we are familiar with the efficiency and reliability which they offer,” said Mikael Lindholm, Head of the Newbuilding Department at Finnlines.

“High efficiency and sustainable operations are increasingly becoming the key focus areas for ferry operators around the world, and our range of products, systems, and integrated solutions are designed and developed to achieve the highest levels of performance in these areas. This latest Finnlines order is further evidence of the success of this approach. These new ferries will be among the most eco-friendly ferries of their type, setting new standards for sustainability and energy efficiency,” said Mika Ojutkangas, General Manager, Sales, Wärtsilä Marine Power.

The 230 m long ferries will be capable of carrying approximately 1100 passengers and will have 5100 lane metres for rolling freight. The Wärtsilä equipment is scheduled for delivery to the yard commencing in spring 2022, and the vessels are expected to enter operational service in 2023.

WA Company Awarded Contract for Hunter-class Frigate Program

The Western Australian company Altrad Services has been contracted to provide blast and paint services during the prototyping phase of the Hunter-class frigate program. The prime contractor for the program, BAE Systems Maritime Australia (previously known as ASC Shipbuilding), signed the contract with Altrad Services in December after a competitive tender process.

Altrad Services will prepare the steel supplied by BlueScope

Steel AIS by blasting it and painting it with a primer, prior to being cut and fabricated into blocks.

The completed blocks will then pass through the new block paint facility, ensuring that the blocks are in a condition to paint and then be ready to be transformed into prototype blocks.

During prototyping, the processes, systems, tools, facilities and workforce competencies will be established, tested and refined before construction commences on the first Hunter class frigate in 2022.

HMAS *Melville* returns to work

After a number of weeks of critical maintenance, in mid-December HMAS *Melville* resumed her role of surveying the Australian coast.

The Leeuwin-class hydrographic ship has been in service for 20 years and during this time has spent many hours at sea enabling safe navigation, supporting maritime trade and supporting on going protection of our borders.

BAE Systems Australia has provided front-line maritime sustainment for the Royal Australian Navy at the Tropical Reef Shipyard for more than two decades.

As well as developing and sustaining an important maritime capability in the region with a workforce of around 60 people, the company has developed a local supply chain to support ship sustainment with an annual spend of around \$40 million a year.

There were more than 500 maintenance tasks undertaken on the ship, including extensive work on the hull, 10 000 hour harbour diesel generator replacement, and 15 000 hour service on the main diesel generator.

BAE Systems Australia Managing Director Defence Delivery, Andrew Gresham, said “An important local



HMAS *Melville*
(Photo courtesy BAE Systems)

maritime sustainment capability has been developed in Cairns to support the operating requirements of the RAN in this region.

“The team’s success is due to a combination of local ‘know how’ and commitment, and the vast engineering experience from within the national sustainment business to ensure that the navy has the capability that it requires, when it is needed.”

Innovation to Underpin Frigates

BAE Systems Australia’s shipbuilding business has selected four Australian companies to help fast track world-leading manufacturing processes following the first ‘innovation challenge’ to support the Hunter-class frigate program.

BAE Systems Maritime Australia (formerly known as ASC Shipbuilding) is running progressive ‘innovation challenges’ as the Hunter-class program ramps up so that the best

Australian technologies will support and deliver efficiencies to the program.

The winning companies from the first challenge are:

Datanet (SA)
Lamson Concepts (NSW)
Cohda Wireless (SA) and
Dematec Automation (SA)

Over the course of the project’s life-span, each of the selected Australian companies will showcase their logistics and Track & Trace technologies at the Tonsley Innovation District in Adelaide.

BAE Systems Maritime Australia will build nine of the world’s most potent submarine-hunting frigates at the state-of-the-art Osborne shipyard for the Royal Australian Navy.

At Tonsley, BAE Systems Maritime Australia has partnered with Flinders University to establish Line Zero — Pilot Factory of the Future, to collaborate with researchers, academics and technologists to test and trial advanced manufacturing technologies and techniques in a factory environment, before adapting them to the shipyard.

BAE Systems Maritime Australia Managing Director, Craig Lockhart, said “The immense size of the Hunter-class frigate program provides a great focus on the ships which will be manufactured at Osborne and not necessarily the smarts that will go into them.

“Through these Innovation Challenges we have the potential to revolutionise the way the ships are constructed from the ground up, significantly improving efficiency and productivity.”



Maintaining a long tradition — HMAS *Hobart* at anchor in the Derwent River as Flagship of the 183rd Royal Hobart Regatta (RAN photograph)

MEMBERSHIP

Australian Division Council

The Council of the Australian Division of RINA met on the afternoon of Tuesday 8 December 2020 by Zoom-conference under the chairmanship of our President, Gordon MacDonald, in Canberra with links to Cairns, Gold Coast, Newcastle, Sydney, Canberra, Launceston, Adelaide and Perth.

Among the items discussed were:

Registration as Not-for-profit

Council continued progressing with its efforts for registration under Australian law.

Walter Atkinson Award 2020

Council noted arrangements underway for the Award to be sent to its winners in New Zealand, since face-to-face presentation was not possible due to COVID.

Coordination of Section Technical Meetings

Council agreed to arrangements whereby Section Secretaries would advise each other of forthcoming technical meetings. In addition, Council would explore the possibility of establishing a web-page detailing all forthcoming meetings.

Members Expectations of RINA

The President welcomed the small number of responses received to his call for input from members on this subject through his column in the November 2020 issue of this journal. He would appreciate any further feedback.

Roles and Capabilities of Naval Architects

The Secretary reported on the work being undertaken on this subject by the Institution's Council in London. His presentation to a technical meeting of NSW Section a week before the Division Council meeting is outlined elsewhere in this issue.

Annual General Meeting of Division

Council agreed that the AGM would be held as a virtual meeting using Zoom on Wednesday 17 March 2021. The formal meeting notice appears in this issue of *The ANA*.

Next Meeting of Division Council

The next meeting is tentatively scheduled for the afternoon of Tuesday 16 March 2021.

The draft minutes of the meeting are available to Council members on the Council forum and are available to other members by request to the Secretary.

Rob Gehling

Secretary
ausdiv@rina.org.uk
0403 221 631

Walter Atkinson Award 2020

The Walter Atkinson Award was established in 1971 to commemorate the life, work and service of Walter Atkinson as a founding member of the Australian Branch (now the Australian Division) of RINA. The Award is made with the object of *stimulating increased interest in the preparation, and to raise the standard, of technical papers presented to the naval architecture community in Australia*. A nomination

must be a written paper, either first presented at a RINA-supported conference in Australia, or first published in a RINA-supported publication in Australia.

The Walter Atkinson Award for 2020 was won by Sally Garrett and Tom Durrant for their paper *Characterising the Southern Ocean and Ross Sea Wave Climate*, presented at the Pacific 2019 International Maritime Conference. In the normal course of events, the award would have been presented at SMIX Bash 2020 which, of course, did not happen due to COVID-19 restrictions. Instead, the certificate and prize were posted to Sally in Auckland, New Zealand.



Sally Garrett with her decanter and the certificate for the Walter Atkinson Award 2020
(Photo courtesy Sally Garrett)

Free Papers for Members

Members should be aware that they are entitled to four free copies of RINA papers each year. This includes papers from previous transactions, conferences, etc., and is especially useful if you are interested in just one or two papers from a particular conference as you don't then need to buy a copy of the entire proceedings.

Papers published by RINA are searchable on the RINA website www.rina.org.uk; click on

Publications>Search Publications and Order.

The procedure for obtaining a free copy is to email your request to publications@rina.org.uk, with the subject line "Member's Free Paper", and specify the author(s) and year, the title of the paper, where the paper appeared (transaction year/volume, conference name and year, etc.) and, finally, your name and RINA membership number.

Free Places for Student Members at RINA Conferences

RINA also makes available two free places for Student Members of RINA at conferences organised by the Institution, including the Indo-Pacific International Maritime Conferences in Sydney.

The procedure for obtaining a free student place is to email your request to the Chief Executive, Chris Boyd, at cboyd@rina.org.uk, and specify the conference, your name and membership number.

Changed Contact Details?

Have you changed your contact details within the last three months? If so, then now would be a good time to advise RINA of the change, so that you don't miss out on any of the Head Office publications, *The Australian Naval Architect*, or Section notices.

Please advise RINA London, *and* the Australian Division, *and* your local section:

RINA London	hq@rina.org.uk
Australian Div.	rinaaustraliandivision@iinet.net.au
Section ACT	rinaact@gmail.com
NSW	rinansw@gmail.com
Qld	ash@oceanicdesign.com.au
SA/NT	rinasantdiv@gmail.com
Tas	gregorm@amc.edu.au
Vic	keeganparker@thrustm.com
WA	rina.westaus@gmail.com

Phil Helmore



RINA AUSTRALIAN DIVISION

NOTICE OF ANNUAL GENERAL MEETING

WEDNESDAY 17 MARCH 2021

Notice is hereby given that the Annual General Meeting of the Australian Division of the Royal Institution of Naval Architects will be as a virtual meeting by Zoom at 1830 Australian Eastern Daylight Time on Wednesday 17 March 2021.

Please notify the Secretary no later than Friday 12 March 2021 if you wish to attend, to enable Zoom attendance details to be sent to you before the meeting.

Apologies should be received by the Secretary no later than Monday 15 March 2021.

AGENDA

1. Opening
2. Apologies
3. To confirm the Minutes of the AGM held on 31 March 2020 [1]
4. To receive the President's Report
5. To receive, consider, and adopt the Financial Statements and Auditor's Report for the year ending 31 December 2020
6. Announcement of appointments to the Australian Division Council
7. Other Business

R C Gehling

Secretary

Email: rinaaustraliandivision@iinet.net.au or ausdiv@rina.org.uk; Phone: 0403 221 631

1 February 2021

[1] Refer Division Forum: https://www.rina.org.uk/res/Minutes_of_AGM_2020.pdf

NAVAL ARCHITECTS ON THE MOVE

The recent moves of which we are aware are as follows:

Suryo Anggoro continues consulting as R95 Naval Architect, in Jakarta, Indonesia.

Mark Bayly moved on from Defence and, after some time at Plessey Australia and GEC Marconi Systems, took up the position of Principal of Bayly Group, product design and development specialists, in Melbourne.

John Benjamin has retired from Thales Australia after nearly 44 years; he graduated from UNSW Sydney with his Bachelor of Engineering degree in naval architecture with Honours Class 2 and commenced his career as a cadet naval architect with the (then) Department of Navy at HMA Naval Dockyard, Garden Island, and finished as Director Engineering — Maritime with Thales Australia. He is looking forward to having the time to increase his skills in foreign languages, music and travel (when possible).

Gillian Carter continues as Principal of Pacific Marine Design, and has taken up the position of Project Manager Design with De Voogt Naval Architects/Feasibility in Haarlem, The Netherlands.

Lauchlan Clarke has moved on from the Naval Technical Bureau and has taken up a position with Jacobs in Canberra; Jacobs, in turn, is contracted to the Capability Acquisition and Sustainment Group of the Department of Defence and is engaged with them on Project SEA 3036, the Guardian-class Pacific Patrol Boat Replacement program.

Rowan Curtis continues consulting, but now has AMSA-accreditation as a surveyor for all surveys except electrical, and is principal of a new company, Broad Reach Marine, based in Coffs Harbour, NSW.

Scott Davenport continues as a Senior Naval Architect with Austal Ships and has taken on the role of Technical Authority in Henderson, WA.

Paul Duncan has moved on from Bumi Armada and has taken up the position of Senior Consultant with INCITIAS in Melbourne, providing advisory and engineering solutions for the oil and gas, defence and marine industries,

Ahmed Elhanafi has moved on from Austal Ships and has taken up a position with the Stability, Hydrodynamics and Support-craft Cell, Directorate of Navy Engineering, Department of Defence, in Canberra.

Tommy Ericson has moved up the ladder from Aus Ships, and has taken up the position of Director of the Aus Ships Group in Brisbane.

Mark Evans moved on from Crondall Energy in 2017 and, after some time at Lumina House, has taken up the position of Director at BE&R Consulting in Perth, providing advice to the oil and gas energy sector in concept development, project and engineering support for greenfield developments and brownfield modifications.

Geoffrey Fawcett has resigned from Svitzer Australasia and is finishing off a master's degree in Professional Engineering Leadership while evaluating opportunities.

Kristian Fet has moved on from Kongsberg Maritime and has taken up a position as a naval architect with Evoy, a company involved in electric motors (inboard and outboard)

for small boats and workboats, in Florø, Norway.

Ben Gilkes continues as Founding Director, but has rebranded his company, previously named Edwell Energy, as swrm Environmental Services in New York, with an app to let users know how they can transition to a more sustainable lifestyle, and help drive the sustainability efforts of manufacturers and retailers globally.

LCDR Geordie Grant has moved on from the Capability Acquisition and Sustainment Group and has taken up the position of Marine Engineer Officer on HMAS *Sydney* with the Royal Australian Navy.

Peter Henry has moved on from Braemar Technical Services and has taken up the position of Loss Adjuster with Lloyd Warwick in Houston, TX, USA.

Sam Henson has moved on from Botany Timber and has taken up a position as a naval architect with Oceantech in Adelaide.

Sue-Ellen Jahshan has moved on from Thales Australia and has taken up the position of Detailed Design Manager with Naval Group Australia in Adelaide.

Zoran Jaksic has moved on from Thales Australia and has taken up the position of AOR Engineering Manager with Navantia Australia at Garden Island in Sydney.

Claire Johnson has moved on from the Directorate of Navy Engineering (formerly Naval Technical Bureau) and has taken up the position of Engineering Manager with the Chief Systems Engineer Branch of the Capability Acquisition and Support Group, Department of Defence, in Canberra.

Anthony Krokowski has moved on from Real Journeys in New Zealand and has returned to Australia where he continues as Principal Surveyor/Naval Architect with Aquamarine in Brisbane.

Andy McNeill has moved on from Jacobs Engineering and has taken up the position of Senior Surveyor with Lloyd's Register in Melbourne, undertaking surveys of existing commercial vessels, naval vessels (The LHDs, HMAS *Choules*, HMAS *Sirius* and STS *Young Endeavour*) and consultancy work; he continues to hold the rank of LEUT in the Royal Australian Naval Reserve.

Simon Merrigan has moved on from Incat Crowther and has taken up the position of Project Engineer with Atlantic and Peninsula Australia in Sydney.

Teresa Michell continues as Mathematics Coordinator at St Peter's Catholic College, Tuggerah, NSW.

Katie Miller privately learned to fly planes and helicopters, and then moved on from the RAN submarine fleet in 2015 and took up a position as a helicopter pilot, teaching student pilots to fly helicopters in Perth.

Warren 'Skip' Miller continues as Senior Engineer with Composites Consulting Group in Sydney.

Richard Milne has returned from his family yachting holiday on the Coral Coast and continues in his position of Technology Manager Hull in the Directorate of Navy Engineering, Department of Defence, in Canberra.

Farrokh Mistree continues as the LA Comp Chair and Professor in the School of Aerospace and Mechanical

Engineering at the University of Oklahoma in Norman, OK, USA, where he and his wife, Dr Janet Allan, have also set up the Systems Realisation Laboratory (see <http://srl.ou.edu/>). Adrian Mnew has retired from Transport Safety Victoria and, while getting used to the retiree's pace of life, is spending much of his spare time on board the start boat at the Sandringham Yacht Club.

Martin Mok moved on from Shearforce Maritime Services in 2017, then spent two years with Bridgeport Energy in Sydney, and is now evaluating opportunities.

Henry Morgan continues as a naval architect/project manager with Incat Crowther in Sydney.

Carl Morley moved on from Air Radiators in 2018 and, after some time at Australian Maritime Technologies, has taken up the position of Risk Reduction Manager/Naval Architect with Thrust Maritime in Melbourne.

Brett Morris has moved on from the Defence Science and Technology Group and has taken up the position of Systems Architecture and Modelling Lead at Naval Group Australia in Adelaide.

Brett Murrie continues consulting as Brett Murrie Marine Design in Brisbane.

Joanna Mycroft has moved on within Lloyd's Register and has taken up the position of Surveyor in Singapore.

Kay Myers has moved on from BAE Systems and has taken up the position of Construction and Commissioning Manager for the new Antarctic icebreaking supply and research vessel with Serco in Hobart.

Giang Ngo continues consulting as GN Marine in Adelaide.

Trung Nguyen moved on from the Vietnam Maritime Register in 2006 and, after some time at Subsea 7, DOF Subsea and Pro Draft Group, has now taken up a position as Senior Project Engineer with Fugro in Perth.

Tim Nicol moved on from Clough in 2004 and, after some time at JP Kenny, the Conservation Council of WA, and St John Ambulance, he joined the Pew Charitable Trusts, where he has now taken up the position of Manager Western Australia in Perth.

Cameron Nilson-Linne moved on from naval architecture consulting in 2016 and completed an apprenticeship as a carpenter with Raw Build, then built his own home, and is now a trade carpenter working in all aspects of carpentry for local, custom projects in Perth.

Alex Nolan continues as Boat Captain for the Black Jack Sailing Team in Brisbane.

James Nolan has moved on from BMT Surveys (Australia) and has taken up the position of Senior Naval Architect and AMSA-accredited Marine Surveyor with Maritime Survey Australia in Melbourne.

Jeremy Nolan has moved on from Commercial Marine Solutions and has taken up the position of Naval Architect with Birdon Group in Port Macquarie, NSW.

Robert Ochtman-Corfe has moved on from the Royal New Zealand Navy and has taken up the position of Technical Authority Mechanical with Contact Energy in Auckland, New Zealand.

Daniel Oliver has moved on from ASC and has taken up the position of Naval Architecture Manager, Maritime/Engineering Services with Thales Australia at Garden Island in Sydney.

The Australian Naval Architect

Rozetta Payne has transitioned from Ship Structures Cell Lead with the Naval Technical Bureau to Naval Architecture Centre of Expertise Lead within the re-badged Directorate of Navy Engineering, Department of Defence, Sydney.

Alex Robbins has moved on from the MATV Project and has taken up the position of Engineering Manager on the SEA3030 Project for HMAS *Choules*, in Sydney.

Malcolm Rowe has moved on from Patrick Container Terminals, has since completed a master's degree in data science, and is now evaluating opportunities.

Nick Stark has moved on from Silver Yachts and is now consulting as Nick Stark Design in Perth. Friends can find out more at www.nickstark.design.

Gayoung (Carrie) Suh has moved on from John Butler Design and has taken up the position of Solution Consultant with NetSuite in Sydney.

Krish Thiagarajan moved on from the University of Western Australia in 2011 and, after some time at the University of Maine, has taken up the position of Endowed Chair in Renewable Energy and Professor at the University of Massachusetts Amherst in Amherst, MA, USA.

Jiong Wang has moved on from UNSW Sydney and has taken up the position of Project Engineer/Document Controller at CSL Group Inc. in Sydney.

Stephen Watt has moved on from Neptune Marine Services and has taken up the position of Senior Subsea Engineer with MMA Offshore in Perth.

Lily Webster has moved on from the Directorate of Navy Engineering and has taken up the position of Systems Engineer at Nova Systems in Canberra.

Jeffrey Williams moved on from Optus in 2016 and has taken up a position as a Program Manager/Strategist, contracting to multiple Defence departments in Canberra.

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 editors 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 Rob Gehling when your mailing address changes to reduce the number of copies of *The Australian Naval Architect* emulating boomerangs.

Phil Helmore

Martin Grimm

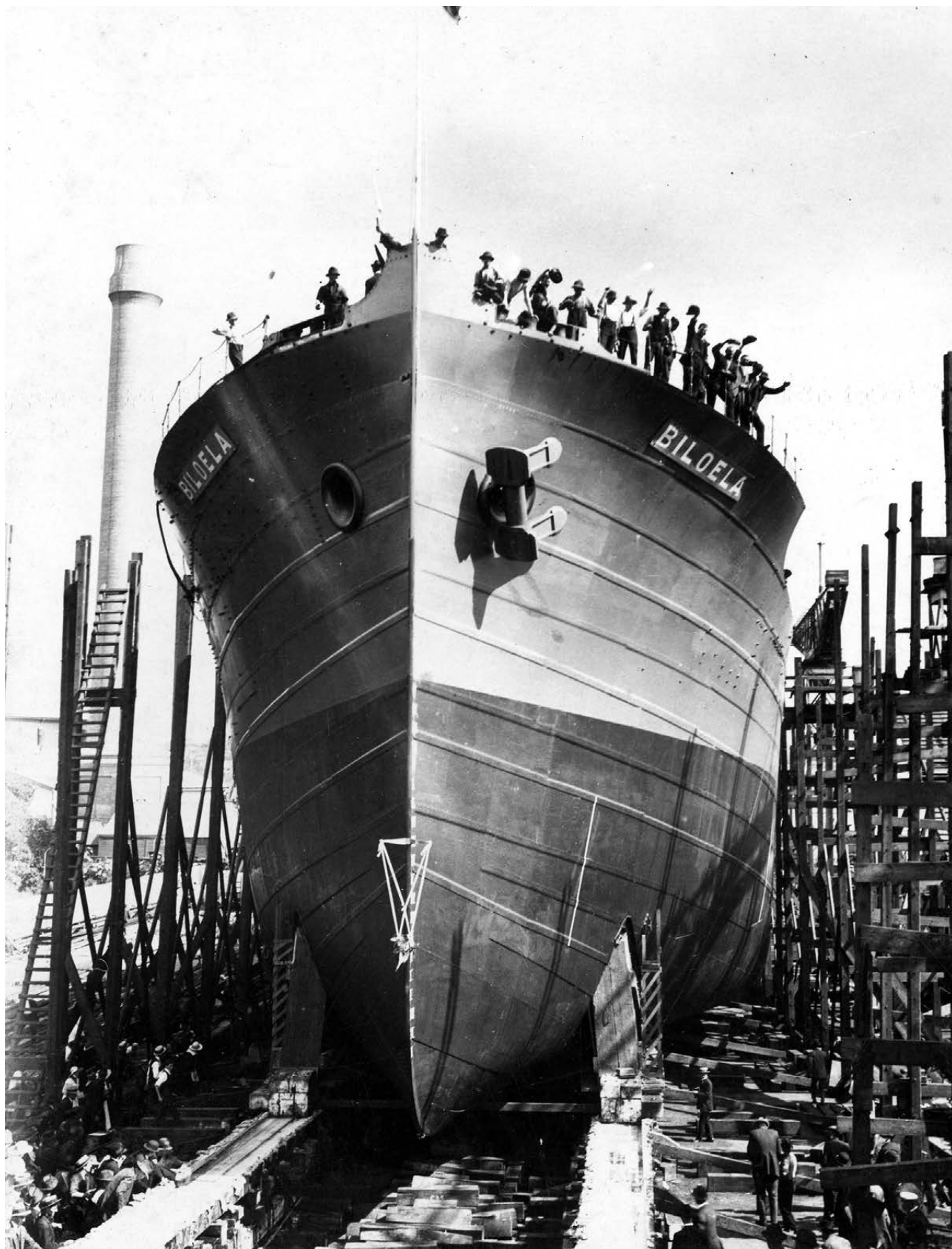
THE AUSTRALIAN NAVAL ARCHITECT

**Contributions from RINA members for
The Australian Naval Architect
are most welcome**

Material can be sent by email or hard copy. Contributions sent by email can be in any common word-processor format, but please use a minimum of formatting — it all has to be removed or simplified before layout.

Photographs and figures should be sent as separate files (not embedded) with a minimum resolution of 200 dpi. A resolution of 300 dpi is preferred.

FROM THE ARCHIVES



The Fleet Collier *Biloea* heads for the water at her launching by the Commonwealth Naval Dockyard, Cockatoo Island, Sydney on 10 April 1919. Designed in Australia to supply ships of the RAN with coal and other supplies, the 115.76 m long ship could carry 4360 t of coal, 1199 t of oil, 327 t of fresh water, 1090 t of general stores and 654 t of bunker coal. Completed on 10 July 1920, she was the first ship to be built of Australian steel which was supplied by BHP in Newcastle. Most of her machinery and equipment was also made in Australia. Sold in March 1931, she entered commercial service under a number of names. As *Cree*, she was sunk by a German submarine off Scotland on 21 November 1940

(Photo J C Jeremy Collection)

The beautiful *Kelpie*, built in 1893 by shipwright George Ellis at Drummoyne, NSW, was the oldest competitor in the 185th Australia Day Regatta conducted on Sydney Harbour on 26 January. *Kelpie* is flying the ensign of the Sydney Amateur Sailing Club (Photo John Jeremy)

