

THE AUSTRALIAN NAVAL ARCHITECT



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February 2015



The Minister for Defence, Kevin Andrews, Senator Fawcett and the Member for Hindmarsh, Matt Williams, recently inspected the AWD facilities in Adelaide and progress on the first of Australia's air-warfare destroyers, the future HMAS *Hobart*
(Photo courtesy Department of Defence)

THE AUSTRALIAN NAVAL ARCHITECT

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D6, recently completed by Aluminium Marine
in Queensland for Explore Group New Zealand
(Photo courtesy Incat Crowther)

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RINA Australian Division

on the

World Wide Web

www.rina.org.uk/aust

From the Division President

Since at least 2005, Division Presidents have taken the opportunity presented by this column to provide the President's Report to be delivered at the Annual General Meeting, which this year will be held on 4 March, reporting on the activities of the Division during the previous year.

My election as Division President in September 2014, in rather unusual circumstances, gives me the opportunity to report on the past activities of Council and also to present some of the ideas for the future which I intend to take forward to Council this year. Some of these ideas have originated from conversations with RINA members and they have appeared to me to be worthy of further discussion to improve the services of our Institution. I am sure that it is more useful for members to share the future rather than to dwell on the past, however interesting it may have been, but this mix of past and future has resulted in a rather lengthy column.

The past year has been a busy one for most of our members, with a wide diversity of projects being undertaken. This is reflected in the diversity and quality of the technical presentations that I have attended and read about in *The Australian Naval Architect* as well as watched on the internet. These presentations at the Sections are a key function of our Institution, providing a dissemination of knowledge and technical information of aspects of the very wide skills involved in the task that we call naval architecture. The Section meetings form the vital grass roots of professional development which allow us to grow our skills and to progress our individual position in the industry. Supporting the Section activities, the function of the RINA Division Council is primarily handling the finances in a responsible manner and acting as a uniform authority on naval architecture matters in Australia, particularly in those matters involving government authorities, who welcome a united voice rather a mass of individual voices.

However, busy Sections mean a busy time for the Division Council as well, and this presents a quandary — busy people have scarce time to give to the running of the Sections and the Council, together with the associated publications and other activities, and the effort of these volunteers is not always fully appreciated. I would therefore like to publicly acknowledge the tremendous effort that many of our 750 members put towards making RINA successful in Australia. In particular, I want to mention (in alphabetical order) Craig Boulton for his unsung work as Division Treasurer, Rob Gehling for coping with his extreme workload as our Division Secretary, John Jeremy and Phil Helmore, as well as Jesse Millar, for the outstanding work which they put into producing the *The ANA*, and all of the Section Chairmen and their committee members which space does not allow me to nominate. Also I want to acknowledge our past President, Jim Black, for his leadership and drive on important matters in the early part of 2014 before his resignation. My thanks to everyone for your efforts. If you enjoy the *The ANA*, then remember that it is produced by volunteers, so please consider finding some space in your busy day to assist the RINA (Australian Division) to move forward and not slip back.

Naval architects in Australia are involved in a very wide

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range of activities, more so than in many other countries. This gives us the opportunity to move on into other fields of our profession, an aspect that makes the job so interesting for many. For example the *The ANA* in 2014 presented articles covering naval planning, design and construction, naval maintenance, commercial steel vessel design and construction, education, the offshore oil and gas industry, research establishment activities, aluminium design and construction, sailing yacht design and construction, world-record breaking, maritime safety, and classification society activity amongst others.

Vessels designed and/or built in Australia in 2014 include some large aluminium patrol boats (the Cape class), air-warfare destroyers, the upgrade of the Anzac frigates, the LHD project (HMAS *Canberra*), three large aluminium commercial craft for export, and a busy year for RDMC in Hobart with three deliveries and three new orders. There has been a tremendous amount of design activity for aluminium light craft, particularly from Incat Crowther and One2Three Naval Architects, whose contracts seem to fill many pages of the *The ANA*. I have also watched out of my window a constant stream of module load-outs for the oil and gas industry, representing many thousands of tonnes of steel, mainly wrapped in plastic, which have been assembled for the Gorgon project, one of the world's largest offshore gas developments.

There has been much public discussion this year of the submarine replacement programme and the capability of Australia's major naval shipyards, together with a Senate Inquiry into why the tender for naval supply ships was restricted to only two overseas shipyards. This is an on-going issue with too many naval projects happening at one time with haphazard timing and far too few skilled resources to design and build them. This was an issue identified by the Division Council several years ago, but successive Governments have failed to address the issue. However, one highlight of the year has been the success of the AMC in obtaining financial support from the Australian Research Council to set up a training centre for the transformation of naval manufacturing and to provide an opportunity for higher degrees and post-doctoral fellows to conduct research in an industrial environment. At UNSW Australia, the building housing Mechanical Engineering has been undergoing a major refurbishment, and the naval architecture stream has been subjected to upheaval and working from alternative accommodation. Elsewhere, DSTO has taken the opportunity to set up stronger links with industry.

The Government plans for a Single National Jurisdiction covering the ship industry have become reality, and from a marine safety viewpoint have provided some challenges for AMSA. The process for accreditation of surveyors has now been published and has resulted in some debate amongst members with differing views. Hopefully the transition from State to National Survey will be completed by the intended date of 2017.

There were two honours awarded to members in 2014–15 which are worthy of mention, not least because both recipients are past Division Presidents. Dr Stuart Cannon (DSTO) was honoured by the University of Tasmania for his work in forging links between academia and industry, and John Jeremy was made a Member of the Order of Australia

for significant service to the preservation and celebration of naval and maritime history in the recent Australia Day honours list. I offer our congratulations to them both.

With the 2014 industry background outlined above, this year the Australian Division Council has covered a relevant number of activities.

- Financial management of the money under our control. Our income comes from four major sources — a proportion of the annual membership fees you pay to HQ, interest from our capital investments, our involvement in the Pacific series of conferences, and advertising in *The ANA*. Our expenditure has principally been the production of *The ANA* but, with the change-over to digital copies, this could free up some money for other purposes.
- Jim Black's mid-term resignation as Division President in September, owing to the pressure of work, was unfortunate (especially for me) but I believe that it was fairly seamless and carried out in accordance with the By-laws of the Division. The Hon. Secretary ensured that there was no disruption to the daily routine of the Division during the change over, and Jim and I (as Vice-President) had worked together on RINA issues prior to the change-over.
- The change-over of the *The ANA* from hard copy to digital format on-line has been well-received by members, particularly noting the impact of colour. Our Hon. Secretary put a big effort into this change over, conducting a survey of all our members and making sense of a wide diversity of views. Thank you, Rob. The change-over has hopefully not increased the workload of our hard-working editors and it has the potential to save a useful amount of money for the Division.
- Joint Board meetings of RINA (Australian Division) and Engineers Australia have been held this year. The Agreement between us has been updated and now acknowledges the reciprocity of the current grades of membership of each Institution and also the equivalences of engineers registers such as CEng with CPEng.
- The Division has made submissions on behalf of members to the Senate Economic Committee Enquiry into Naval Shipbuilding, including both Part I (the tender process for the RAN's new supply ships) and Part II (the future sustainability of Australia's strategically-vital naval shipbuilding industry). Our submissions highlighted the lack of forward planning by successive Governments and the resultant impact on our members and the shipbuilding industry in general. Our Hon. Secretary played an important role in consolidating our members' comments into a cohesive document, for which I am grateful.
- The Walter Atkinson Award goes from strength to strength, and this year's competition had some excellent submissions, as reported in the *The ANA*. My thanks to Dr Kim Klaka and his team of Vesna Moretti, Lance Marshall and Alan Muir who read and judged all of the entries in accordance with the Award Guidelines. Congratulations to Richard Dunworth, the winner of this year's award, for his excellent paper *Back Against the Wall*. It will be a challenge for members to maintain the high standard for the 2015 award, for which eligible papers will not include a Pacific IMC (Conference) for the first time since re-activation of this award.

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- The Division, principally through the actions of our Hon. Secretary, has attended meetings at AMSA relating to a revision of the Single National Jurisdiction which is due to come into effect in 2017. It was not possible to make any consolidated submission on the issue of regulations for surveyor accreditation owing to a lack of response from members, but it is appreciated that members may have made their own individual submissions.

- The Division has been discussing with Engineers Australia the preparation of a submission to the Board of Professional Engineers Queensland regarding the use of prescriptive codes, and whether their use constituted a professional engineering service.

- The Division wrote to the Minister of Defence highlighting the difficulties being created by the lack of vocational training in naval architecture and associated professions, which followed the closure of the naval architecture diploma courses at TAFE NSW Sydney Institute. This led to a dialogue with Manufacturing Skills Australia who have continued to work with the Division on developing appropriate vocational courses which are expected to be required, especially for future naval work.

- The Division also carried out several administrative tasks, including a draft archiving policy for both Division Council and Sections and digitising of the hard copy collection of technical papers presented between 1954 and 1996, and which should soon be available on the RINA web-site.

- Organisation of the Pacific 2015 IMC is well underway.

- The Hon. Secretary has been liaising with HQ and the various Sections of the Division to assist them in preparing for the forthcoming visit of the RINA President, Bruce Rosenblatt, to Australia in late February. Bruce is making the visit principally to see our Section activity.

Future potential activities

I propose to promote the following activities to Division Council in 2015:

- Continue with support of our submission to the Senate Inquiry into Naval Shipbuilding in whatever practical way that we can, with the aim of ensuring that most of our naval activity remains within Australia and that our skill levels are retained and not further eroded.

- Set up a sub-committee of Council to promote the implementation of the findings of the Rizzo Review.

- Set up a sub-committee to prepare for the promised 2015 Government White Paper and the 10-year Defence capability Plan, analyse the documents and prepare a response if necessary. In this regard it is noted that there are likely to be future frigates, Pacific patrol boats, and replenishment ships as well as the submarine replacements.

- Encourage members of our oil and gas sector to present technical papers more widely, such as in the *The ANA*, and assist them where possible to become more visible through mini-conferences and/or seminars.

- Set up a sub-committee to more actively seek to assist AMSA in smoothing the transition to a Single National Jurisdiction on Marine Safety.

- Improve the links with academia. Previously strong links have weakened and yet we rely on them to encourage student membership.
- Monitor the development of new IMO regulations covering offshore facility support craft carrying more than 12 passengers (e.g. wind-farm support vessels), and seek to comment as required, through AMSA and through RINA HQ.
- Monitor the development of new IMO regulations covering high-speed craft, and the Energy Efficiency Design Index, and seek to comment as necessary through AMSA and through the specialist technical committees operated by RINA HQ.
- Investigate the feasibility of a prize or award for a young naval architect or marine or offshore engineer (not at University).
- Investigate closer cooperation with Engineers Australia.
- Improve systems for harnessing the knowledge, skills and interests of the Division's members to enable these professional characteristics to be efficiently and effectively injected into the work outlined above.
- The Vice-President and I are keen to raise the public awareness of RINA, such that we are seen as the authority of choice on matters relating to ship and boat design and production, as well as the providers of safe marine craft. I believe that this can be achieved through quality submissions to Government and a greater involvement by members in the activity of their local Section. Exactly how this might be achieved has yet to be identified.

Finally, if you have any suggestions, encouragements or gripes, please feel free to contact me by email at fastships@spin.net.au, or telephone 0418 838 830.

Tony Armstrong

Editorial

I was very pleased to be able to spend Australia Day on board the RAN's newest ship, HMAS *Canberra*, as she took part in the Salute to Australia off Circular Quay in Sydney at midday and then moved down harbour to take her station as Flagship of the 179th Australia Day Regatta. The Navy is clearly very proud of their latest acquisition, which is now engaged in first-of-class trials off the coast of New South Wales. I am sure that her Spanish and Australian builders feel equally proud of this fine ship.

Completing and handing over a new ship is a special event for every shipbuilder — no matter how big or small the ship may be. It is a strange feeling, a mixture of pride and of loss. The gap at the wharf is huge without the ship upon which many people have worked every day, sometimes for years. Responsibility for her future passes to her new owners and crew, and the shipbuilder is no longer her custodian and maintainer. The memories of possible trials and tribulations experienced during her design and construction fade in the glow of the satisfaction with her completion.

We report many new ship completions in the pages of *The Australian Naval Architect* — ships which have been designed or built by naval architects and members of our Institution. There are more although, sadly, today not many the size of HMAS *Canberra*. I suspect that some readers feel that we may have overlooked their own latest pride and joy. It is certainly not intentional — but we depend on members telling us what they are up to and of their own and their employer's achievements. Always remember that this is your journal and we welcome contributions from members. Please tell us what you have been doing. Your editors would be very happy to be faced with the problem of too much material and not enough pages.

John Jeremy



HMAS *Canberra* in Sydney Cove on a rather wet Australia Day 2015
(RAN photograph)

LETTERS TO THE EDITOR

Dear Sir,

Why do Yacht Designers fit T-bulbs to the Keels of Modern Racer-cruisers?

Perhaps some of your readers can enlighten me. The answer to the title question that might reasonably be expected is “because T-bulbs are faster”, but that is perhaps too simplistic.

The question arose when I started investigating entanglement of yachts with craypots. This has become a serious problem on the west coast (and elsewhere), so we are exploring different strategies to manage the risk. I have been keeping a log of entanglement incidents, with over 30 recorded to date. Whilst most of those incidents are snags of pot lines on the rudder or propeller, about one third seem to be snagged on the keel bulb when yachts are under sail. There is a performance trade off between any hydrodynamic or stability advantage of the T-bulb, and the time lost disentangling. In order to find out where that trade-off lies, we need to know three things:

1. The likelihood/frequency of entanglement.
2. The time taken to disentangle.
3. The performance advantage of the T-bulb compared with a less “catchy” L-bulb.

Likelihood of Entanglement

This is clearly highly variable, but for many races it is close to one entanglement every 24 hours. Here are some informative extracts from reports of yachts entangled whilst racing

Race 1

“On the [overnight] feeder race. Calm weather, 10 knots, night (of course) we caught four pots and one craypot line with three floats which was just floating around. The four pots stopped us and we lost around 1.5 hrs clearing all of them through the night we reckon. The loose line dropped our speed and then we had to physically pull the line in to free us. We reckon caught on keel (T-keel!) Action to remove — manoeuvre until free, sail backwards etc., no cutting of anything. No damage sustained.”

Race 2

“Same on recent [overnight] race, same conditions early am, dark, etc., but only caught one. There was a line of pots set for some miles in a north-south line off the coast and we caught one on the way up. On the way down we were in daylight so could avoid them”

Race 3

“[Overnight] race. Most yachts also reported becoming entangled in craypot lines during the race, the long floating lines creating a constant hazard at night.”

It would appear that the likelihood of entanglement on an overnight race is nearly 100%. Let’s say that only one third of them are around the keel, then we could estimate there is a 30% likelihood of entanglement around the keel on an overnight race. It could be 10%, it could be 50%, but it’s somewhere in that ballpark.

Time Taken to Disentangle

Estimating the time taken to disentangle has an even wider range of uncertainty than estimating the likelihood of entanglement. The first of the above reports quotes 1.5 hours which is a severe case but the minimum time lost in stopping the boat, backing it up and (hopefully) freeing the pot must be at least a couple of minutes, probably a lot more. So let’s say the average time lost is five minutes per entanglement. It is somewhere between two minutes and 90 minutes.

Performance Gain of a T-bulb

This is where the naval architects start to get excited. My first thought was to go to the regular fall-backs of Hoerner (1965) and Hoerner (1975), expecting to find something useful about aircraft wing-tip tanks or similar — but nothing. That’s the first time they have failed me. An initial cursory internet search didn’t reveal anything useful either. The next step was obvious — phone a friend. Whenever there is an intriguing design problem I turn to model yachts to see what they do. They use T-bulbs and have problems catching weed in some ponds. Luckily a friend of mine is a professional model-yacht designer who has been looking into fins and bulbs, but with a very different approach from what I expected.

Fin Twist

His research revealed that the flexure of the fin affected performance — especially twist induced by the longitudinal position of the bulb. An L-bulb has its centre of gravity well behind the twist axis of the fin, so will induce twist. A T-bulb, on the other hand, has its centre of gravity close to the twist axis of the fin, so the amount of twist, if any, will be small.

The twist changes the angle of attack of the fin along the span, which in turn alters the lift distribution and vertical centre of pressure. The optimum span-wise lift distribution is usually (but not always) elliptical, but the notion that this is generated by an elliptical profile (e.g. the Spitfire wing), has long ago been proven incorrect when the waves on the free surface are taken into account. Also, a bulb will increase the lift at the fin tip, which can move the distribution away from optimum, but it also has a pseudo-endplate effect, which alters the optimum distribution from elliptical towards uniform. Hmmmm...

Twist (positive) will produce more lift near the tip which will, in turn, create a higher heeling moment. It will reduce the leeway angle of the hull, and here is the design dilemma — most hulls are very inefficient side-force generators, so reducing hull leeway angle should increase overall lift-drag ratio. However, whilst that might be true for a fat or deep hull, it is rather less so for a slender hull, so the benefit or drawback of twist depends on the hull slenderness.

Let us assume, though, that twist is detrimental to performance. Given the difficulties in quantifying its effect, I have taken a different approach. Let us suppose we wish to reduce the twist angle on a keel by, say, half. What is the increase in fin thickness required to achieve this, and what is the resulting drag increase and speed loss? To halve the twist we must double the polar moment of inertia, which varies roughly as the cube of section thickness. So a 26% increase in section thickness will halve the twist. From Marchaj

(1979), achieving this by increasing the section thickness from a NACA 0012 to NACA 0015 will increase the section drag coefficient by 11% at Reynolds numbers typical for yacht keels. What contribution does this make to total drag? Using convenient published data for the YD-40 in Larsson and Eliasson (1994) the section drag contributes about 11% of total drag at six knots boat speed and 6% at eight knots. Let's call that an average of 8% around the course. So the increase in drag due to increase in keel thickness is 11% of 8%, which is a 0.9% increase in total drag. Next, let us make a wildly hand-waving approximation that drag varies with the cube of speed, then we have a 0.3% drop in speed due to the increase in keel thickness required to halve the twist angle. For a 24-hour race this corresponds to a time loss of just over 4 minutes.

Fluid Flow

Now let's get back to bulb longitudinal placement itself. A nicely-packaged piece of research from Chalmers University (Axfors and Tunander, 2011) examined the hydrodynamic differences of several keels, all with the same draft and righting moment. The results were then put into a VPP and they found some interesting answers. A well-designed T-bulb (a craypot catcher) is faster than a well-designed L-bulb (a craypot dodger), but not by much. Interestingly, the study found that a conventional non-bulb fin was even faster than the T-bulb, though they qualify that statement with reasoning that is not very convincing in my view. Taking the average of the VPP results for true wind speeds of 8, 12, 16 and 20 knots, over a range of wind angles representative of an Olympic-style race course, the T-bulb averages two and a half minutes faster than the L-bulb over 24 hours of racing (it's nearly six minutes faster in eight knots of wind and just 30 seconds faster in 20 kn).

Overall Speed Effect

Taken over a 24-hour race, if we add the two and a half minute speed loss due to L-bulb position and the four minute speed loss due to increased keel thickness, we have a total speed loss of about 6.5 minutes for the L-bulb compared with the T-bulb. Our earlier estimate of likely time lost due to a keel entanglement in an overnight race was around five minutes, with a 30% chance of it occurring. In other words, the T-bulb is only faster if you are sailing somewhere where the likelihood of entanglement is low (and the typical wind speeds are low).

So there we have it — the benefit of the T-bulb on a race course along a lobster-friendly coastline is marginal at best, and they are a big nuisance when cruising — designers please take note!

My next task is to investigate ways to reduce the likelihood of craypot entanglement with the propeller and rudder. Some cruisers fit a wire from the keel trailing edge to the bottom of the rudder (or skeg if they have one). It is easy to calculate the drag increase (from data on towed umbilical cables, e.g. Erdsal, 2004), but do those wires actually reduce the likelihood of entanglement? Any feedback?

Kim Klaka

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Dear Sir,

In recent years, the shipbuilding industry in Indonesia has greatly expanded, for mining, passenger ferries, and fishing purposes. Batam, the small Indonesian island near the coast of Singapore, is a free-trade zone and thus does not require GST or import tax on equipment and materials imported to the island, an important cost incentive for many companies. Because of this, Batam has the most shipyards in Indonesia and generates the most revenue, producing 50% of the total vessels built in the country.

According to the Indonesia National Shipowners' Association, between March 2007 and March 2013, 6500 new vessels were built, with new activity mainly in the sectors of pleasure boats made from fibreglass and wood, fishing boats, work boats (such as tugs), and patrol boats.

Due to an increased demand for aluminium vessels used as offshore-support vessels, aluminium has in the past five years become a prominent shipbuilding material in Indonesia, alongside steel. Unlike in Australia, aluminium was previously uncommon due to its high cost, and Indonesia's lack of technology made it difficult to manufacture. In more recent times, however, with the growing economy and Indonesian market, shipbuilding companies have had an increasing ease of access to aluminium plates which are used in the construction of their vessels, either having them imported from nearby countries such as Australia or even made locally as the industry continues to grow.

The growth of the shipbuilding industry has also been supported by the Indonesian government which, in 2012, started a project to build 1000 fishing boats for local fishermen. Commercial vessels have also aided the growth of industry and hold a strong share, as they are often used to support mining activities for offshore rigs, the mining industry being one of Indonesia's main sources of income.

Although Indonesia has only recently started to develop with new technologies and innovative design, the shipbuilding industry is rapidly developing and evolving to suit a more-efficient means of production and maintenance, adapting a similar style to the shipbuilding industry of the Western world and will hopefully continue to expand and grow.

Elisa Taniputra

UNSW Student

Dear Sir,

I have noticed that the Australian naval shipbuilding industry

has a tendency to go through 'boom and bust' cycles. A potential 48 vessels are scheduled to be added to the Royal Australian Navy (RAN) fleet over the next 20 years. However, there will be a period between 2016 to 2020 where the workload will be relatively light, potentially a 'bust' period. With the current rate of technology advancement, especially in the alternative-energy sector, is there a concern that Australia could be left behind? Twelve submarines were to be built in South Australia by the Australian Submarine Corporation (ASC) in this 20-year period but there is already talk that this might drop to six submarines, and the Australian Navy might be considering buying from overseas. Is this already a sign that the 'boom and bust' nature of the Australian naval ship building industry is making it challenging to be competitive on the world stage?

The sustainability of the education system could also be called into question. A strong education base is the key to progression of the industry through research and the addition of skilled graduates to the workforce. If there is a 'bust' period, then people will be less likely to study towards a job in an industry with minimal job opportunities so, when the time comes for another 'boom' in the industry, there isn't the capacity within Australia to design and produce the cutting-edge technologies required for military vessels.

How does the future look for the Australian naval shipbuilding industry when compared to overseas shipbuilding industries, with a consistent scheduled workload, and are there any steps planned to minimise the highs and lows of the Australian industry?

James Phillips

UNSW Student

Dear Sir,

An artificial or man-made island is one which has been constructed by people rather than formed by natural means. It can be created by expanding existing islands, construction on existing reefs, or amalgamating several natural islands into a bigger island. Currently, artificial islands are an expensive but, in some cases, lucrative option for many cities having

lack-of-land problems. In the future they may be common sights, as many cities (especially Asian cities) around the world face severe urban land shortages and congestion. Eventually, necessity may make man-made islands a logical option.

With all the technology and expertise that we have nowadays, I am just wondering why we don't have an artificial island built on a vessel yet? We do have very large vessels sailing on the sea. The biggest vessel ever made to date (still under construction) is Shell's Prelude FLNG which has an overall length of 488 m, almost the same as the height of the second-tallest tower in the world, Taipei 101. We also have Oasis-class cruise ships which have the capacity of up to 5400 passengers on board. I believe that, with the expertise which the world has now including naval architects, naval engineers and enough funding, the dream of "making" our own land is not an unachievable dream anymore.

The idea of building an island on a vessel is not new. There are some conceptual designs and sketches posted on the Internet, but these are not the same as in my mind. The basic idea is identical, but I am thinking of a larger scale for that idea. I am thinking more of a floating city, which has a stadium, a mall, a park, condominiums and so on, and underneath the city is a vessel. The vessel doesn't have to be one single giant vessel, because we can make it in hexagonal shapes and combine them together so that it will look more-or-less like a honeycomb structure.

I believe that, if this idea can be implemented, then it will have a huge impact on not just the naval-architecture and marine engineering industry, but also on human civilisation. With this artificial island project, we might not just solve the problem of inflation of prices of land property, we might also prevent unnecessary wars such as between North and South Korea, and Israel and Palestine, which last more than decade as they want more land for their own country.

Nazrin Mohd Fauzi

UNSW Student



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NEWS FROM THE SECTIONS

Western Australia

The Western Australian Section has started the year off on a strong footing from the progress and achievements made during the previous year.

During 2014 the committee proactively tried to improve the participation and engagement of the WA membership with positive results. The achievements made during 2014 include:

- In October a membership survey was rolled out with the aim of providing a feedback avenue from members to the committee, in order to understand the demographic and wants and concerns of the membership.
- A new venue in Perth CBD was trialled in lieu of the Flying Angel Club to better engage membership who work in the city. In 2015 the aim is to alternate venues between the city and Fremantle. Options are also being explored for a new venue in Fremantle.
- The committee started exploring modifications of the format of the bi-monthly technical meetings, such as multi-speaker formats which facilitate more discussion.
- Presentation topics are now planned to be better balanced between the offshore and traditional shipbuilding industries.
- RINA WA is now in active talks with the organisers on the AOG conference, proposing that RINA have a presence in AOG for 2016, hosting a conference stream representing floating systems.

In January 2015, RINA WA hosted a CEng Workshop, where naval architects aspiring to become full members and achieve chartered status could learn about the application process, listen to engineers who had recently completed their applications, and hear from members of the interview panel. This was the first of a proposed regular series of evenings. With standing room only at the first session, the committee is quietly confident of the ongoing success of this initiative and hopes to make it an annual series.

Gerard Engel

New South Wales

SMIX Bash 2014

The fifteenth SMIX (Sydney Marine Industry Christmas) Bash was held on Thursday 4 December aboard the beautifully-restored *James Craig* alongside Wharf 7, Darling Harbour, from 1730 to 2130. The Bash was organised jointly by RINA (NSW Section) and the IMarEST (Sydney Branch). About 210 guests came from the full spectrum of the marine industry, including naval architects, marine engineers, drafters, boatbuilders, machinery and equipment suppliers, regulators, classifiers, surveyors, operators, managers, pilots, navigators, researchers, and educators. Equally importantly, the full spectrum of age groups was represented, from present students to the elders of the marine community.

It was also great to see intrastate, interstate and international visitors in the throng, including Richard and Anne Vie from the UK, Tony Armstrong from Fremantle, Rob Gehling and Doug Matchett from Canberra, and Gregor Macfarlane and Mark Symes from Launceston.

The Australian Naval Architect

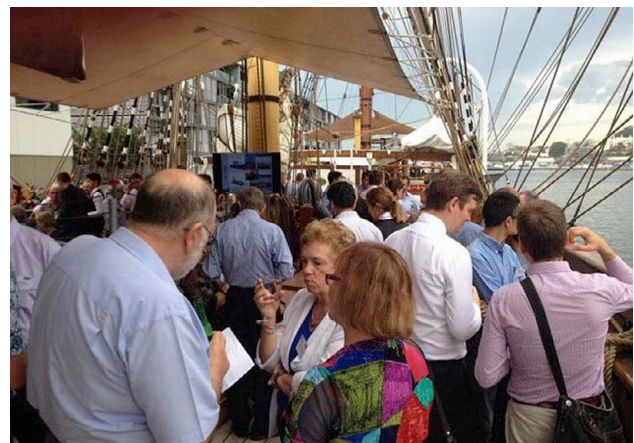


The SMIX Bash registration desk on *James Craig* and the queue on the gangway
(Photo courtesy Graham Taylor)



Some of the crowd enjoying drinks and hors d'oeuvres on board *James Craig*
(Photo courtesy Graham Taylor)

Sydney turned on a beautiful evening, despite the threat of a thunderstorm and rain (which eventuated as the late-stayers were being shown the gangplank), and many partners in attendance enjoyed the view from the decks of *James Craig*. Drinks and hors d'oeuvres were provided and a delicious buffet dinner was served in the 'tween decks, followed by a selection of Christmas-themed petit fours, tea and coffee, and mini gelati, and many tall tales and true were told.



Some more of the crowd enjoying drinks and hors d'oeuvres on board *James Craig*
(Photo courtesy Graham Taylor)

Bookings were trialled using the Trybooking website this year, and it worked a treat. All tickets were sold before the event — you really do have to be early!

Formalities were limited to a speech by the Chair of the SMIX Bash Organising Committee, Adrian Broadbent, who welcomed the guests and thanked the industry sponsors, a speech by Richard Vie, President of the Institute of Marine Engineering, Science and Technology, and the presentation of the Walter Atkinson Award for 2014 by the President of the Australian Division of RINA, Tony Armstrong.



Some of the crowd on board *James Craig* listening to Adrian Broadbent's speech
(Photo Phil Helmore)



Richard Vie (R) and Adrian Broadbent
(Photo Phil Helmore)

The raffle was drawn by Mrs Anne Vie, and the winners were:

First	Sue-Ellen Jahshan	Big Christmas hamper
Second	Michelle Soars	Christmas hamper
Third	John Wilson	Wine pack

The lucky-door prize was also drawn by Mrs Anne Vie. The winner was Marilyn Dunworth who scored a \$50 gift voucher to the Australian National Maritime Museum's shop.



Anne Vie drawing the lucky-door prize with Len Michaels and Adrian Broadbent
(Photo courtesy Graham Taylor)

This year's event was sponsored by the following organisations:

Platinum

- Damen Shipyards Group
- TeeKay Shipping (Australia)

Gold

- ABS Pacific
- AMC Search
- AusBarge Marine Services
- BAE Systems Australia
- DNV GL
- Electrotech Australia
- Energy Power Systems (Caterpillar)
- International Paints
- Lloyd's Register International
- Svitzer Australasia
- Sydney City Marine
- Thales Australia
- Wärtsilä Marine Power

Silver

- Alfa Laval
- AMD Marine Consulting
- ASO Marine Consultants
- Cummins South Pacific
- FP Marine Risks
- MTU Detroit Diesel Australia
- Noakes Group
- PB Towage
- Schneider Electric

Bronze

- Edwards Marine Services
- Lightning Naval Architecture
- One2three Naval Architects
- Shearforce Marine Services

Our thanks to them for their generosity and support of SMIX Bash 2014, without which it could not happen.

Walter Atkinson Award 2014

Walter Atkinson was a Geordie who arrived in Australia with a solid background in shipbuilding from the Tyneside in Newcastle, UK. He spent time as the Hull Overseer at Cockatoo Island Dockyard, and at Navy Office in Melbourne. He finished up as Superintending Naval Architect at HMA Naval Dockyard, Garden Island, and was still employed there when he died after a short illness in 1970. He was a founding member of the Australian Branch (as it was then) of the Royal Institution of Naval Architects, and a long-serving member of council. He was widely respected for his “people skills” and for his practical shipbuilding knowledge.

To perpetuate his memory, the Council of the Australian Branch resolved in 1971 to present a Walter Atkinson Award, annually at its discretion, to a selected paper presented at a meeting of the Institution in Australia. The object of the award was

“to stimulate increased interest in the preparation, and to raise the standard, of technical papers presented by members to the Institution.”

The award was originally valued at approximately \$25.00 and the inaugural presentation, made in 1972, was an impressive painting of the clipper ships *Ariel* and *Taeping* racing under full sail. The Award is now valued at \$250.00. The Australian Division Council broadened the eligibility criteria in 2002, while adhering as closely as possible to the original intent and therefore re-worded the object:

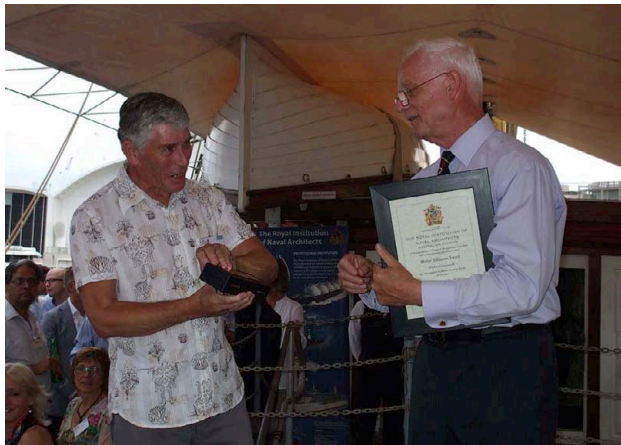
“to stimulate increased interest in the preparation, and to raise the standard, of technical papers presented to the naval architecture community in Australia.”

The award is made by a panel appointed by the Australian Division Council.

The Walter Atkinson Award for 2014 went unanimously to Richard Dunworth for his paper *Up Against the Wall*, presented at the Pacific 2013 International Maritime Conference and which described a new method of analysing the inclining experiment which dispenses with the usual limitations associated with wall-sidedness. At Richard’s request, the prize for 2014 was an analogue planimeter!

The award was presented to Richard at SMIX Bash 2014 on board *James Craig* by the President of the Australian Division of RINA, Tony Armstrong.

Phil Helmore



Tony Armstrong (R) presenting the Walter Atkinson Award for 2014 to Richard Dunworth on board *James Craig*
(Photo courtesy Rob Gehling)



Richard Dunworth with his Walter Atkinson Award certificate and planimeter
(Photo courtesy Marilyn Dunworth)

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 150 dpi. A resolution of 300 dpi is preferred.

COMING EVENTS

Australian Division AGM

The Annual General Meeting of the Australian Division of RINA will be held on Wednesday 4 March immediately following the scheduled technical meeting of RINA (NSW Section) and IMarEST (Sydney Branch) at 6:00 for 6:30 pm at Engineers Australia, 8 Thomas St, Chatswood; see notice sent separately to members. The AD AGM is expected to start at approximately 7:30 pm.

NSW Section AGM and Technical Meetings

The Annual General Meeting of the NSW Section of RINA will be held on Wednesday 4 March immediately following the AGM of the Australian Division of RINA which, in turn, follows the scheduled technical meeting of RINA (NSW Section) and IMarEST (Sydney Branch) at 6:00 for 6:30 pm at Engineers Australia, 8 Thomas St, Chatswood; see separate notice. The NSW Section AGM is expected to start at approximately 7:45 pm.

Technical meetings are generally combined with the Sydney Branch of the IMarEST and held on the first Wednesday of each month at Engineers Australia, 8 Thomas St, Chatswood, starting at 6:00 pm for 6:30 pm and finishing by 8:00 pm.

The program of meetings for 2015 (with exceptions noted) is as follows:

4 Feb	Raymond Fagerli, UNSW Graduate <i>Resistance Prediction for Trimarans</i>
4 Mar	Peter Little, Vice President Fleet Operations, Carnival Cruise Lines <i>The Dry-dock Challenge: Docking a Cruise Ship in Australia</i>
4 Mar	NSW Section Annual General Meeting
1 Apr	Warren Miller, Senior Design Engineer, Composites Consulting Group <i>Side Lifting Foils and Support Structure on Wild Oats XI</i>
6 May	IMarEST
3 Jun	RINA
1 Jul	IMarEST
5 Aug	RINA
2 Sep	IMarEST
7 Oct	No meeting; Pacific 2015 events
3 Dec	SMIX Bash

HPYD5 Conference

The 5th High Performance Yacht Design Conference will take place on 9–11 March 2015 in Auckland, New Zealand. This coincides with the Volvo Ocean Race Auckland Stopover, and the conference venue will be central to the boats and all the activities on offer.

Papers will be presented on a wide range of topics relating to the design of high-performance power and sailing yachts, including:

- foil performance and design of foil-borne craft
- wing sails
- structural design and analysis
- performance prediction
- wind tunnel and towing tank testing

- computational methods
- hull and appendage design

Final papers were due on 1 October 2014, and all papers are being reviewed by an international technical panel. Abstracts are now available on the conference website, and registration is open.

The provisional conference program is as follows:

Date	Time	Venue	Event
Sun 8	1800–2100	VOR Marquee, Hobson Wharf	Icebreaker function
Mon 9	0830–1700	Marine Events Centre	Conference
	1900–2030	VOR Marquee, Hobson Wharf	Public lecture
Tue 10	0830–1700	Marine Events Centre	Conference
	1900–2300	Royal NZ Yacht Squadron	Conference dinner
Wed 11	0900–1700	Marine Events Centre	Conference
Thu 12	0900–1700	Core Builder Composites Southern Spars University of Auckland	Optional industry visits
Fri 13		Auckland Harbour	Volvo Pro-Am Race
Sat 14		Auckland Harbour	Volvo in-port Race
Sun 15		Waitemata Harbour	Start of VOR Leg 5

Burns Fallow from North Sails will be the keynote speaker, and Knut Frostad will present the public lecture on the Volvo Ocean Race.

An exciting development is that an agreement has been reached with SNAME (Chesapeake Section) and Ecole Navale (Innov'Sail) to provide a coordinated rolling three-year program of high-quality yacht technical conferences.

See www.hpyd.org.nz for more details and/or to register.

FAST 2015

The thirteenth International Conference on Fast Sea Transportation (FAST) will be held on 1–4 September in Washington, DC, USA, the nation's capital. Since their inception in Trondheim, Norway, in 1991, the FAST conferences, held every two years, have been the world's leading technical conferences addressing fast sea transportation issues.

The aim of the conference is to promote world-wide cooperation among scientists, engineers and operators who are concerned with all aspects of the high-speed maritime industry. The FAST Conference program for 2015 will focus on high-quality papers and invited keynote lecturers. A thorough review process, of both abstracts and full manuscripts, will be used to select papers whose originality, relevance, timeliness, and significance meet the standards FAST attendees have come to expect. The conference will be conducted in the English language.

Submission of abstracts for proposed papers should be made directly by email to Dr Chris McKesson at chris@mckesson.us. The nominal deadline for abstracts is 30 January 2015, but this *may* be somewhat flexible. There is a 300-word limit on the length.

The conference website is at www.sname.org/fast2015. For further information, please contact Ms Alana Anderson by email aanderson@sname.org or phone +1-703-997 6705.

Pacific 2015 IMC

The next Pacific International Maritime Conference, organised by the Royal Institution of Naval Architects and the Institute of Marine Engineering, Science and Technology and held in conjunction with the Pacific International Maritime Exposition and the Royal Australian Navy's Sea Power Conference, will be held in Sydney on 6–8 October 2015 to coincide with Navy Week, and will be held at an all-new venue: the Sydney Exhibition Centre at Glebe Island.

The change in dates from the traditional January–February timeslot is a result of the success of Pacific 2013, which was held in October 2013 to coincide with the Royal Australian Navy's Centenary celebrations and International Fleet Review on 4 October. In consultation with the Royal Australian Navy, the biennial Pacific International Maritime Exposition will in future coincide with Navy Week during the first week in October.

Held every two years, the Pacific International Maritime Exposition will continue to host two headline events, the RAN Sea Power Conference and the International Maritime Conference (IMC), as well as an extensive portfolio of specialist maritime business and technical seminars and symposia.

Navy Week provides an opportunity for the Royal Australian Navy to promote the importance of maritime trade and naval power to Australia's physical, environmental and economic well-being and security. Maritime Australia Limited is proud to be able to support these aims by organising a world-class industry exposition, according to its CEO, Mr Ian Honnery. "As a not-for-profit foundation, our purpose is to support the development of Australia's maritime industry capacity, both naval and merchant. This has a direct bearing on Australia's national security as well as our economic prosperity," Mr Honnery said.

In 2011–12 Australia's maritime trade was worth over AUD \$400 billion a year, with exports growing at over 6% a year, according to official figures. To help secure Australia's maritime security and trade into the next generation and beyond, the Royal Australian Navy plans to acquire new submarines, frigates, supply ships and patrol boats worth some AUD \$70 billion.

"The Pacific International Maritime Exposition is a showcase for the maritime industry, both naval and merchant, in one of the fastest-growing regions in the world. It attracts exhibitors, high-level official delegations and influential trade visitors from around the globe. This exposure to global opportunities is especially important for Australia's innovative marine industry SMEs. In essence, by bringing the world's maritime industry to Australia, we take Australian companies to the world," Mr Honnery added. "Running Pacific 2015 and its successors during Navy Week

in October every two years will benefit everybody involved."

The new Pacific 2015 venue, the Sydney Exhibition Centre at Glebe Island, has deep-water berths alongside. In conjunction with Sydney Ports Corporation, arrangements are being made to allow RAN and visiting warships to berth directly adjacent to the exposition and this will make it quicker and more convenient to attend ceremonial events or undertake ship visits.

Conference delegates, exhibitors, and trade visitors will be able to get to Glebe Island by car or bus, or by ferry direct from Circular Quay and Darling Harbour, enabling them to enjoy the experience of one of the world's great natural harbours.

Program

Come and listen to a thought-provoking program of plenary and technical presentations which will be of relevance to both the commercial and defence industries. Topics to be covered include:

- Commercial Ship Technology
- Naval Ship Technology
- Submarine Technology
- Commercial Ships Operations
- Maritime Safety
- Maritime Environment Protection
- Offshore Resource Industry

The conference program has been designed to permit all delegates to visit the many industry displays on show at the Pacific 2015 International Maritime Exposition, and the opportunity to conduct informal professional discussions with exhibitors and fellow delegates. Registration for the International Maritime Conference includes free access to the exposition.

Papers

You are invited to contribute to the conference program by submitting an abstract of your proposed paper relating to the conference program topics. Instructions on abstract format and guidelines are available on the conference website. Abstract submissions will close on 9 March 2015. Acceptance of abstracts will be advised to authors by 6 April 2015.

Details and Registration

Full details of registration costs and entitlements are available on the conference website, www.pacific2015.com.au/international-maritime-conference. Conference registrations are now open.

For further information regarding the Pacific 2015 International Maritime Conference contact the Conference Secretariat at imc2015@amda.com.au, phone +61 (0)3 5282 0543 or fax +61 (0)3 5282 4455.



PACIFIC 2015 International Maritime Conference

Sydney Exhibition Centre @ Glebe Island, Sydney Australia

6-8 October 2015

PRELIMINARY ANNOUNCEMENT AND CALL FOR ABSTRACTS



The Royal Institution of
Naval Architects



KEY DATES

- Abstract Submissions Open:
10 November 2014
- Registrations Open:
17 February 2015
- Abstract Submission Deadline
9 March 2015
- Author Acceptance Notification
6 April 2015
- Refereed Paper Submission
22 June 2015
- Full Paper Submission Deadline
13 July 2015
- Early Bird and Presenter Deadline
10 August 2015
- Conference
6-8 October 2015

Organised by the Royal Institution of Naval Architects and the Institute of Marine Engineering, Science and Technology, the Pacific 2015 International Maritime Conference will coincide with the prestigious Royal Australian Navy Sea Power Conference, Navy Week celebrations in Sydney and the **PACIFIC 2015** International Maritime Exposition which is organised by Maritime Australia Limited.

The conference program will be conducted in two streams of parallel sessions and will cover the following topics:

- Commercial Ship Technology
- Naval Ship Technology
- Submarine Technology
- Commercial Ships Operations
- Maritime Safety
- Maritime Environment Protection
- Offshore Resource Industry

Abstract submissions open from 10 November 2014 and prospective authors are invited to submit an abstract relating to the conference program topics in accordance with the instructions on abstract format and guidelines available on the conference website menu.

Abstracts are to be submitted online

www.pacific2015.com.au/international-maritime-conference



For further information contact the

PACIFIC 2015 International Maritime Conference Secretariat at:

PO Box 4095, Geelong VIC AUSTRALIA 3220

Phone: +61 (0)3 5282 0543 Fax: +61 (0)3 5282 4455

Email: imc2015@amda.com.au

CLASSIFICATION SOCIETY NEWS

LR classes *Pieter Schelte* — the World's Largest Vessel

The finishing touches are being added to the world's largest vessel, Allseas' *Pieter Schelte*, at the port of Rotterdam over the next few months. The building of the heavy lift and pipe-laying vessel has been, and continues to be, one of Lloyd's Register's most ambitious and complex projects.

The 382 m long vessel, which was built at Daewoo Shipbuilding & Marine Engineering's Okpo shipyard in South Korea, is being fitted with her main mission equipment ready for final testing before she becomes operational in around four months' time.

LR has overseen the plan approval, design, building and classification of the vessel since 2007.

"The design was novel in almost all respects, and extreme loading requirements were needed on many elements of this very large ship, leading to high steel grades and heavy plate thicknesses. Equally intense was the effort and energy spent on site at DSME's shipyard by both the Allseas and Lloyd's Register teams in order to make sure that the design on paper became reality as we see it now", said Edward Heerema, owner of Allseas.

Horizons, January 2015

ABS Awards Approval-in-Principle for First Cylindrical FLNG Production Unit

The Sevan FLNG design concept approved by ABS provides for a stable platform in deep water, harsh environments and cyclonic conditions.

ABS has granted approval-in-principle (AIP) for the Sevan cylindrical floating LNG (FLNG) production unit concept for offshore production, storage and transfer of LNG, LPG and condensate. The next generation FLNG design concept is based on the proven circular and geostationary Sevan FPSO design, which is being used in the Norwegian and Central UK North Sea and offshore Brazil, and is under construction as the first application of an FPSO unit to be installed in the Barents Sea.

The full scope of design review for the FLNG concept includes an assessment of the feasibility of the structural strength of the equipped FLNG hull and process topside structure, as well as a global performance and safety analysis conducted in accordance with the ABS Rules and Guides for floating LNG units.

"By awarding Sevan AIP, we have acknowledged that the company's innovative approach to designing and constructing a first-of-kind FLNG production unit is based on sound engineering practices and ABS classification standards", said Tor-Ivar Guttulsrød, Director of FLNG, Global Gas Solutions, at ABS. "ABS continues to support new FLNG concepts which, when fully developed and implemented, will strengthen the emerging FLNG market."

The Sevan FLNG production unit will have a proprietary cylindrical hull capable of operating in more than 3000 m water depth and in harsh environments, such as extreme North Atlantic and cyclonic conditions. The unit design is based on environmental load calculations for a 100-

year return storm in the Barents Sea. Similar to the Sevan FPSOs, the FLNG unit's axisymmetric hull shape enables high capacity for LNG storage and deck loads, tolerance for weather spreading, and eliminates the need to weathervane in rough seas. The unit can be designed to have gas processing and liquefaction up to 4 Mt/a and store up to 240 000 m³ of LNG and 36 000 m³ of condensate.

According to Sevan, some of the most significant advantages of a cylindrical hull design are the elimination of the need for a turret and swivel and the favourable motions with very little roll and pitch, as well as a reduction of typical wave-induced fatigue loads and minimised hull deflection, which simplifies the topsides design.

"High availability, inherent safety and simple operation should be the main criteria when selecting technology offshore," said Lars Ødeskaug, Chief Operating Officer at Sevan Marine ASA and responsible for Sevan's LNG efforts. "Sevan's cylindrical FLNG solution meets these criteria at an attractive cost. We are proud to have been granted AIP for our unique design concept, which we believe will introduce a better option for producing, storing and offloading LNG in challenging operating areas."

ABS has been the preferred classification society for the offshore and energy industry for more than 50 years. With the increasing global concern for the environment, clean gas-based energy plays an integral role within that framework. The ABS Global Gas Solutions team formed in 2013 applies its experience and knowledge to support members and clients involved in gas-related projects, including LNG and LPG transportation, the use of LNG and LPG as fuel, and emerging FLNG technology projects.



Sevan cylindrical FLNG unit
(Image courtesy ABS)

ABS Guide for LNG Fuel Ready Vessels

ABS has published the *Guide for LNG Fuel Ready Vessels* to support members and clients in preparing newbuildings for future conversion to gas propulsion.

The *Guide* formalises the process for clients who wish to plan for conversion to LNG fuel at a future date by providing a detailed review and approval, and an associated class notation.

"ABS is a leader in LNG as fuel, with a number of newbuilding and conversion projects in progress, and there is strong interest in preparing for a future in which LNG takes

a bigger role,” says ABS Chairman and CEO, Christopher Wiernicki. “The *Guide for LNG Fuel Ready Vessels* draws on our practical experience by providing a detailed approval process and a notation which clarifies the extent to which a vessel is LNG Fuel Ready.”

The *Guide* includes a basic level of Concept Design Approval, with a design review for approval-in-principle (AIP), and two optional levels for general design approval and installed equipment, which constitute a complete review and survey of the system to be installed on the ship.

The first optional level is a General Design Review which allows an owner to approach a shipyard with a reviewed design package for the gas-fuelled system at the time of conversion.

The second optional level is Detail Design Approval and Installation which constitutes a complete design review and survey of a system which will be installed on the LNG-ready ship in accordance with the *ABS Guide for Propulsion and Auxiliary Systems for Gas Fueled Ships*.

The first level provides an AIP and a descriptive note in the ABS Record. The second level provides a Statement of Compliance with a descriptive note listing the parts of the system which have been reviewed. The third level results in an LNG Fuel Ready class notation for the parts of the system that have been installed, confirming that the fuel system is in full compliance with the *ABS Guide to Gas Fueled Ships* at the time of the newbuilding contract.

“The projects which ABS has already worked on demonstrate the variability from the designer’s and owner’s perspective of the requirements associated with the term ‘LNG Ready’,” says ABS Vice President of Global Gas Solutions, Patrick Janssens. “Rather than relying solely on current notations

and descriptive notes to express to what extent a ship is LNG ready, the ABS *Guide* and notation are powerful tools which go beyond the basics to help clients specify work to be done in the construction phase and when they are ready to convert.”

ABS has a long history of supporting the evaluation of the use of LNG as fuel, undertaking AIP, completing LNG-ready evaluations and providing classification services for LNG conversions as well as newbuilding projects in the United States and Europe.

ABS to Class LNG-fuelled Short-sea Containerships for Nordic Hamburg

ABS has been chosen to class two LNG-fuelled containerships to be built in China for German owner GNS Shipping/Nordic Hamburg. The 1400 TEU vessels will feature dual-fuel propulsion, enabling them to burn LNG and conventional bunker fuel. They will be built at Yangzhou Guoyu Shipbuilding Co. Ltd, for GNS Shipping/Nordic Hamburg for long-term charter to Containerships Ltd Oy of Finland. ABS will review the design, survey the construction and class the ships for operation on delivery in the course of 2016. The order includes options for a further two vessels.

“We are delighted to have been awarded the classification contract for these innovative containerships, which draw on our real-world experience classing vessels using LNG as fuel,” says ABS Europe Division President and COO, Kirsi Tikka. “As shipowners embrace alternative fuels to achieve regulatory compliance and operational efficiencies, ABS is uniquely placed to provide the support needed to realise technically-demanding newbuilding projects.”

The vessels feature an innovative design which reduces the impact of LNG bunker tanks on container capacity, with



As of 12 September 2013, DNV and GL have merged to form DNV GL. We now form the world’s largest ship and offshore classification society, the leading technical advisor to the global oil and gas industry, and a leading expert for the energy value chain including renewables and energy efficiency. We’ve also taken a position as one of the top three certification bodies in the world. www.dnvgl.com

a layout arrangement between two cargo holds. Both the main and at least one auxiliary engine will use dual-fuel technology, providing cleanly-generated electricity for the ship's 300 reefer containers.

"We are pleased to be working with ABS on this project which will change the game for LNG-fuelled ships in the European Sulfur Emission Control Area," says GNS Shipping/Nordic Hamburg Managing Director, Dr Rowil Ponta. "These ships will be the new benchmark for the European feeder trades and in ABS we have a partner with the technical competence and experience to help us deliver."

ABS is a world leader in the LNG-as-fuel concept, having classed the first LNG-powered containerships for US-operator TOTE and the first dual-fuel offshore support vessels in the US for Harvey Gulf. This past spring, ABS released the landmark study *Bunkering of Liquefied Natural Gas-fuelled Marine Vessels in North America*, which provides guidance for potential owners and operators of gas-fuelled vessels, as well as LNG bunkering vessels and facilities, to help them obtain regulatory approval for projects.

The ABS Global Gas Solutions team provides support to members and clients involved in all aspects of gas handling and transport or use as fuel.

Craig Hughes

ABS Classed LNG-powered OSV Delivered

In 2011 Harvey Gulf International Marine became the first US vessel operator to contract for construction of vessels powered by LNG.

The first of these vessels to be delivered is *Harvey Energy*. In addition to being able to operate on cleaner-burning natural gas, *Harvey Energy* has ENVIRO+, Green Passport certification by ABS. The requirements for this certification include that the vessel be continuously manned with a certified Environmental Officer, be completely constructed with certified environmentally-friendly materials, and have

advanced alarms for fuel tanks and containment systems. Along with the Enviro+ and Green Passport notations, these LNG powered OSVs will be the most environmentally-friendly OSVs in North America.

When operating on LNG, *Harvey Energy* meets the highest environmental emissions standards, and will exceed the EPA Tier 4 emission requirements which are to take effect on 1 January 2016. *Harvey Energy* is diesel-electric and powered by Wärtsilä 6L34DF dual-fuel-diesel gensets. Three of them produce a total of 7457 bkW. They will power two azimuthing stern drives: Wärtsilä LIPS units producing 2700 bkW each. The vessel has two bow thrusters: LIPS FT225 M-D units producing 1280 kW each.

A challenge in designing a vessel to run primarily on LNG is onboard LNG storage. Since LNG contains less energy by volume than diesel oil, the LNG tanks have to be significantly larger to give the vessel the same range as conventional diesel tanks. *Harvey Energy* has a single 30.8 m long cylindrical LNG tank located along the centerline under the cargo deck just aft of the house. Harvey Gulf selected Gulf Coast Shipyard Group to build the first six of these historic vessels.

Maritime Reporter & Engineering News, December 2014



Cutaway view of *Harvey Energy* showing the LNGPac fuel system by Wärtsilä (Image from HHPInsight website)

FROM THE CROWS NEST

Symbols

It may interest readers to know the correct symbols for "nautical miles" and "knots".

The International Bureau of Legal Metrology (BIPM) was set up in 1875 to ensure world-wide unification of physical measurements. Their publication, *The International System of Units*, 8th Edition (2006), states that "As yet there is no internationally-agreed symbol" [for the nautical mile]. Similarly, there is no internationally-agreed symbol for knot.

However, in Australia, the National Measurement Regulations prescribe the Australian legal units of measurement of any physical quantity and prefixes which may be used. These include the following non-SI units accepted for use with the International System:

Item	Name	Symbol
3.7	nautical mile	n mile
3.17	knot	kn

By way of explanation, there is no abbreviating symbol for mile ("m" is used for metres) and this is always spelled out. For nautical miles, a space is required after the "n" to indicate that it is not nanomiles that is intended.

The symbol for knot is distinguished from "kN" for kilonewton by the difference in cases of the "n" and "N"; the use of "kt" is incorrect as this is the symbol for kilotonne.

You will find that AS ISO 1000 — 1998 *The International System of Units (SI) and its Application*, AS/NZS 1376 — 1996 *Conversion Factors*, and the Commonwealth Government's *Style Manual for Authors, Editors and Printers* (6th Edition, 2002) are all subordinate to the National Measurement Regulations, and give the symbols quoted above.

The ANA, February 2000 (updated)

GENERAL NEWS



HMAS *Canberra* on Sydney Harbour on Australia Day as Flagship of the 179th Australia Day Regatta
(RAN photograph)

HMAS *Canberra* Joins the Fleet

The Governor General of Australia, His Excellency General the Honourable Sir Peter Cosgrove, AK, MC (Retd), together with the Prime Minister of Australia, the Hon. Tony Abbott, MP, were the guests of honour on 28 November when Australia's first LHD, HMAS *Canberra*, was commissioned into service in the Royal Australian Navy.

The Australian White Ensign was raised for the first time, signalling that HMAS *Canberra* was formally commissioned into the Fleet.

Navy, Army and Air Force members of ship's company lined the ship's hangar as invited guests witnessed the historic event.

The Chief of Navy, Vice Admiral Tim Barrett, AO, CSC, RAN, said that the commissioning was a step towards developing the future of the Navy.

"HMAS *Canberra* is an exciting addition to the Royal Australian Navy. This very capable ship will serve the nation well for decades to come," he said.

Her Commanding Officer, Captain Jonathan Sadleir, AM, RAN, said that it was also a significant moment for the tri-service ship's company who had been training for months in preparation for the introduction of the LHD.

"It was a proud and emotional experience for me to stand with 400 exceptional members of my crew today.

"Through the efforts of many organisations, this outstanding ship is now a reality," Capt Sadleir said.

The ship brings a significant increase in amphibious potential to the Australian Defence Force.



The White Ensign is raised for the first time
on board HMAS *Canberra*
(RAN photograph)

General Particulars of HMAS *Canberra*

Displacement (full load)	27 500 t
Length OA	230.82 m
Beam (moulded)	32 m
Beam WL	29.5 m
Flight deck area	4750 m ²
Flight deck height	27.5 m
Draught (at full load)	7.08 m
Well dock	69.3 m long × 16.8 m wide
Landing craft	Four LCM 1E
Max vehicle mass	65 t
Heavy vehicle cargo deck	1410 m ²
Complement	400 (including watercraft and flight deck crews)
Embarked force personnel	1000

Propulsion

Gas turbine alternator	One LM2500, 19 160 kW
Diesel alternators	Two MAN 16V32/40 each 7448 kW
Propulsors	2 × Siemens azipods each with two 4.5 m propellers, each pod 11 MW

Bow thrusters	2 × 1,500 kW
Emergency generator	1 × Progener-Mitsubishi S16R PTA, 1,350 kW
Speed (maximum)	over 20 kn
(cruising)	15 kn
(astern)	8 kn, maximum with full directional control
Range (cruising speed)	9000 n miles

Aircraft

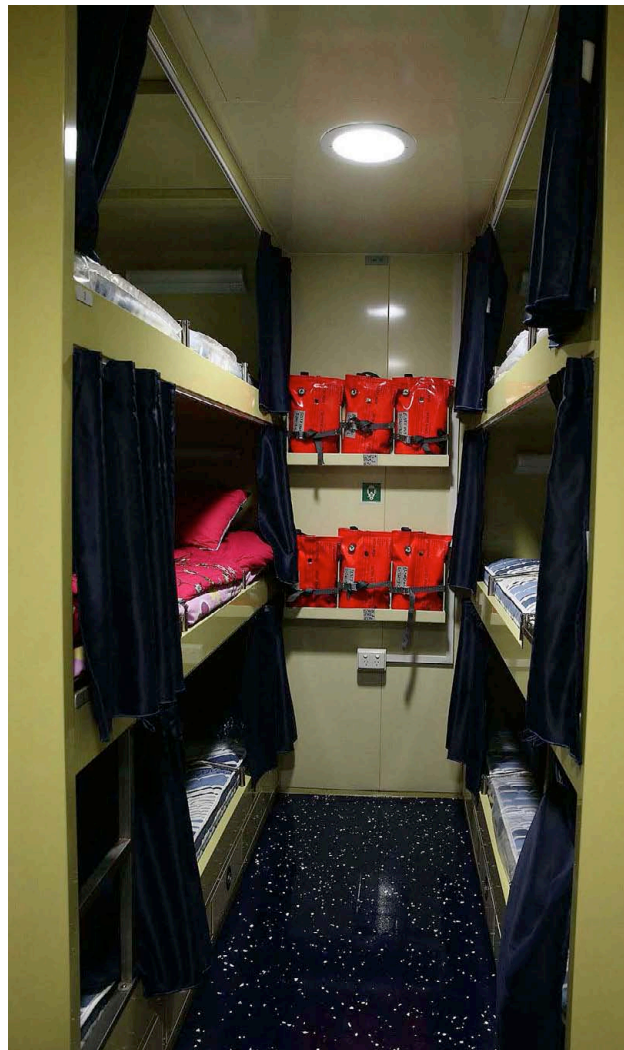
HMAS *Canberra* can operate a range of rotary-wing aircraft, including:

MRH90 helicopter
CH47 Chinook heavy-lift helicopter
UH60 Blackhawk helicopter
S70B2 Seahawk
Armed reconnaissance helicopter
MH60R Romeo Seahawk

Lloyds Register Naval Focus December 2014



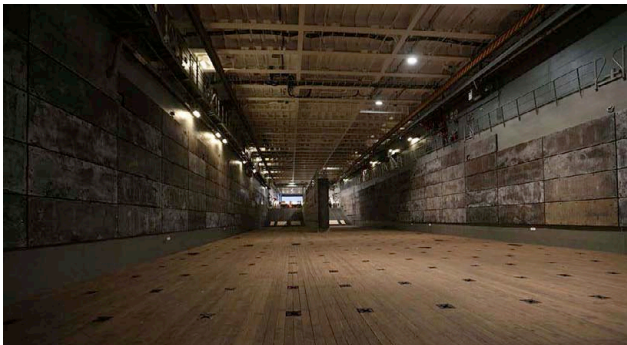
A Junior Sailors' sleeping space on board HMAS *Canberra*
(RAN Photograph)



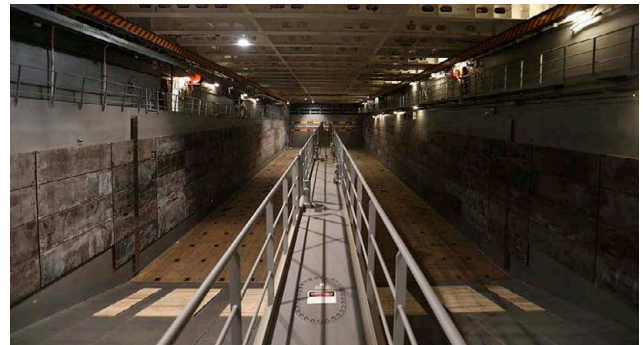
Another view of a Junior Sailors' sleeping space
on board HMAS *Canberra*
(RAN Photograph)



A S-70B-2 Seahawk helicopter on the flight deck of HMAS *Canberra* in preparation for deck handling trials
(RAN photograph)



The well dock in HMAS *Canberra*, looking forward
(RAN photograph)



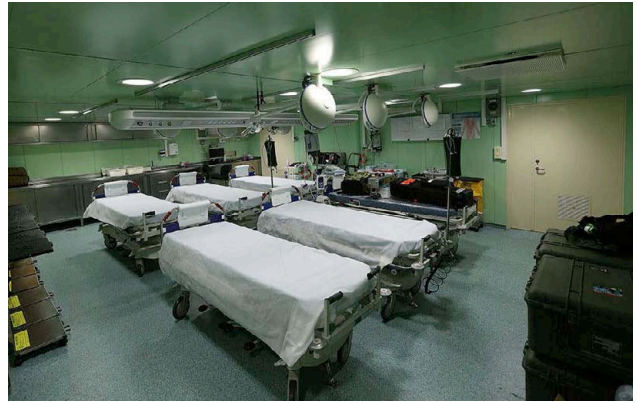
The well dock in HMAS *Canberra*, looking aft
(RAN photograph)



The bridge of HMAS *Canberra*
(RAN photograph)



The galley on board HMAS *Canberra*
(RAN photograph)



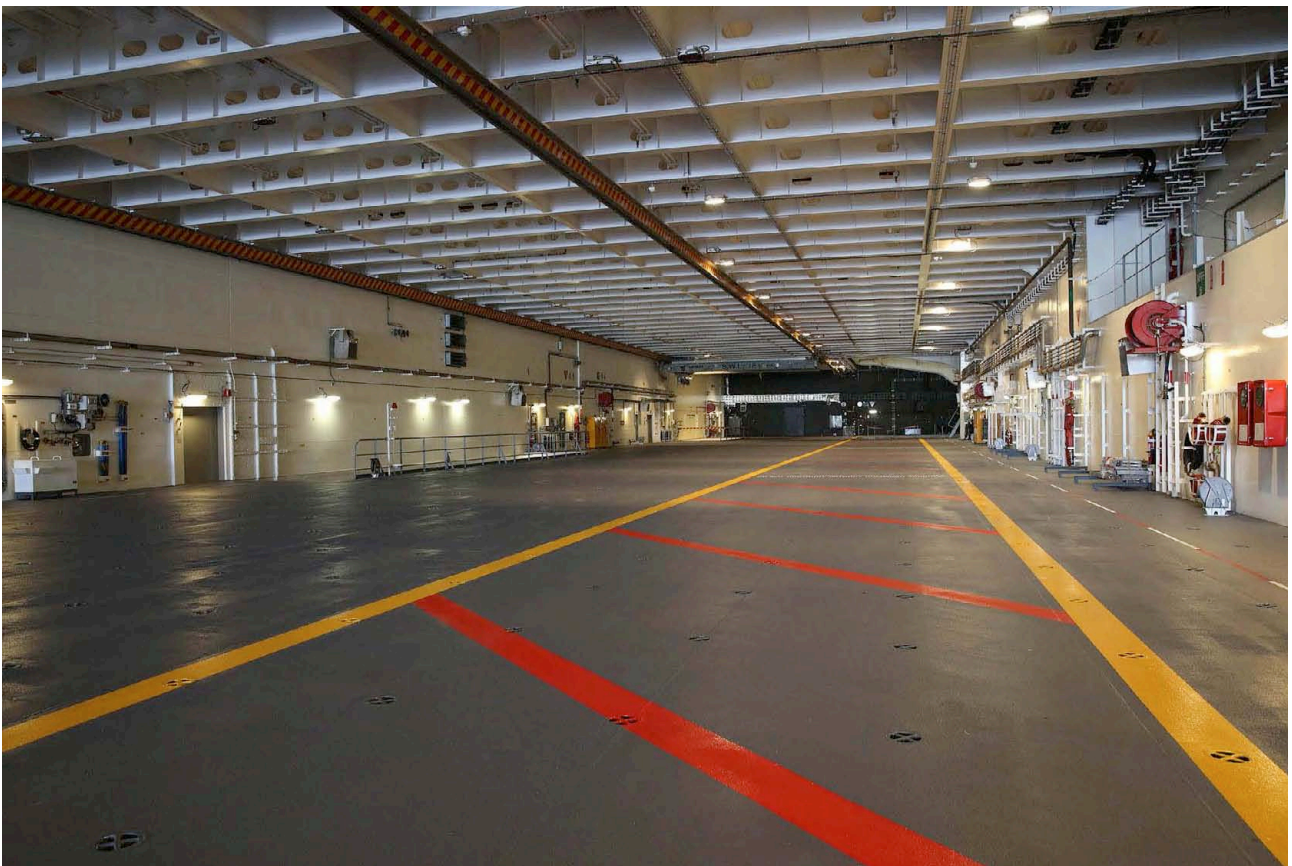
The resuscitation room, part of the medical facility
on board HMAS *Canberra*
(RAN photograph)



The embarked forces cafeteria on board HMAS *Canberra*
(RAN photograph)



The joint briefing room on board HMAS *Canberra*
(RAN photograph)



The hangar and light-vehicle deck on board HMAS *Canberra*
(RAN photograph)



The gas turbine alternator on board HMAS *Canberra*
(RAN photograph)



A landing craft about to dock in HMAS *Canberra* for the first time
(RAN photograph)

A Three-point Plan for a Sustainable Shipbuilding Industry

On 9 December last year, the Government announced a three-point plan which will create a sustainable naval shipbuilding industry that supports shipbuilding jobs.

Firstly, the Government will work with industry to fix the air-warfare destroyer program.

Secondly, the Government will create a sovereign submarine industry and avoid a submarine capability gap.

Thirdly, the Government will create a naval shipbuilding industry around a fleet of future frigates — provided that industry productivity continues to improve.

The Government said that the plan recognises the significant value to Australia of a skilled naval shipbuilding workforce. Announcements about specific programs will be made in due course.

Boost for AWD Program

On 9 December the Government announced a major step to put the \$8.5 billion air-warfare destroyer program back on track to deliver critical capability for the Royal Australian Navy.

Following a competitive procurement process, BAE Systems, Navantia SA and Raytheon Australia will take on increased roles in the air-warfare destroyer program for an interim period. Their increased involvement will drive immediate improvements in shipbuilding performance.

The Government is committed to putting this important Defence project back on track and stop the growing cost and schedule overruns which we inherited from our predecessors by implementing the Reform Strategy recommended by Professor Donald Winter's Independent Review of the Air Warfare Destroyer program.

This focus on resolving outstanding productivity issues will ensure that opportunities to improve performance for the duration of the project are maximised.

The outcomes of this interim period will also inform the Government's considerations on the Australian naval shipbuilding industry in the context of the 2015 Defence White Paper.

This interim period marks a turning point in the performance of ASC and its partners on this important project and will help renew confidence in the future of Australia's shipbuilding industry.

No decisions have yet been made about the long-term arrangements for the air-warfare destroyer program.

The Air Warfare Destroyer Alliance Industry Participants — ASC Shipbuilder and Raytheon — will continue to be responsible for the construction and delivery of the three ships.

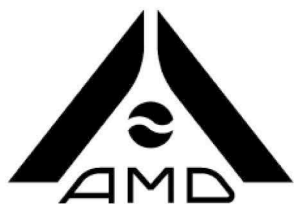
Austal Delivers Fourth Cape-class Patrol Boat

On 15 December, Austal announced that it had delivered *Cape Sorell*, the fourth of eight Cape-class patrol boats being supplied to the Australian Customs and Border Protection Service under a \$330 million design, build and in-service support contract.

Austal's Chief Executive Officer, Andrew Bellamy, said that it represented a significant milestone with half of the Cape-class fleet now delivered, and continuing to be delivered in accordance with contracted timeframes.

"With the delivery of *Cape Sorell*, Austal achieves a significant milestone where half of the Cape-class patrol boat fleet has now been delivered to Australian Customs and Border Protection Service. Austal continues to deliver the Cape-class program on time and on budget. Delivering on time ensures that our customer can reliably continue

AMD Marine Consulting



www.amd.com.au





Cape Leveque entering the water
(Photo courtesy Austal)

to deliver on the border protection obligations which it undertakes for the Commonwealth of Australia”, Mr Bellamy said.

The remaining four Cape-class vessels are at various stages of construction and will be delivered progressively through to late 2015, in line with the contract.

Austal Launches Sixth Cape-class Patrol Boat

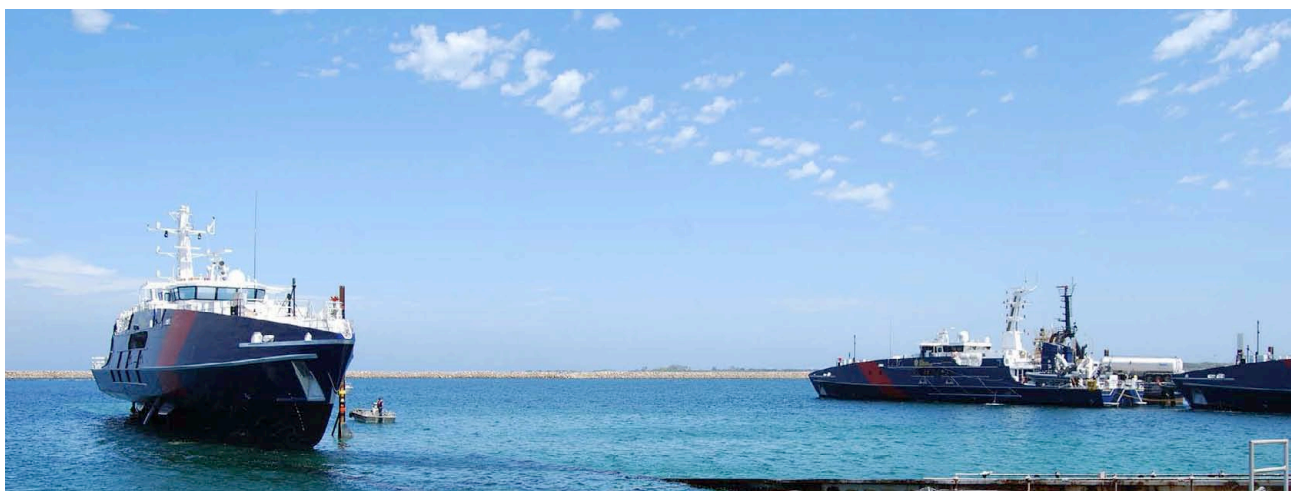
Cape Leveque, the sixth Cape-class patrol boat, was launched on 8 January 2015 at Austal’s Australian Defence Facility in Henderson, Western Australia. The launch of *Cape Leveque* marks the third year in a row in which a Cape-class patrol boat has been launched in the first week of January; preceded by *Cape St George* in 2013 and *Cape Byron* in 2014.

Cape Leveque is the sixth of eight 58 m patrol boats which are being delivered to the Australian Customs and Border Protection Service.

The launch ceremony marked the first time the boat has been lowered into the water. Following maritime tradition, specially-minted coins were placed under the keel block of the vessel as a symbol of good fortune at a keel-laying ceremony on 31 March 2014 attended by then Minister for Immigration and Border Protection, Scott Morrison, MP. The coins were removed prior to the launch and will be presented to the boat, ACBPS and Austal at a later date. The boat was lowered into the water using Austal’s slipway facility.

With the vessel in the water, Austal is on target to achieve full vessel completion and sea trials prior to an official naming ceremony and final delivery to ACBPS in mid 2015.

Meanwhile, the remaining three Cape-class vessels are at various stages of construction and will be delivered progressively through to late 2015.



Cape Leveque being launched with recently delivered *Cape Sorell* in the background
(Photo courtesy Austal)

Austal Australia President, Graham Backhouse, said “The launch of *Cape Leveque*, in accordance with a demanding production schedule, is a great testament to the productivity and efficiency of our workforce. The CCPB Program continues apace and continues to demonstrate Austal’s capabilities of delivering in accordance with requirements on time and on budget. This capability is an important component of Austal’s strategy of being the partner of choice for Governments and a competitive global defence prime contractor which designs and constructs maritime assets, integrates systems and provides ongoing and effective through-life support 24/7.”

Cape Leveque is a state-of-the-art maritime defence capability which will play a significant role in protecting Australia’s borders from multiple maritime threats. She has been designed to have greater range, endurance and flexibility — as well as enhanced capability to operate in more severe sea conditions and across longer range — than the current fleet of Customs and Border Protection vessels and, indeed, the Royal Australian Navy patrol boat fleet.

Austal Lays Keels of Royal Navy of Oman High-speed Vessels

On 16 December 2014 Austal laid the keels of two 72 m high-speed support vessels (HSSVs) for the Royal Navy of Oman. The milestone was formally recognised at an event held at Austal’s shipyard in Henderson, Western Australia.

The milestone was based on 3% of total net structural mass being assembled. This was acknowledged by the classification society stamping a section of the assembled structure. The achievement was witnessed by the resident onsite Royal Navy of Oman Representatives (RNOR) Captain Abdulhameed Al Sinani, Commander Mudhafar Al Riyami and Lieutenant Commander Mubarak Al Kasbi.

Captain Abdulhameed Al Sinani said “this is a very important occasion of the keel laying milestone of Project Bahr Oman.”



Commander Mudhafar Al Riyami, 2IC, Staff Officer 1, Marine Engineer; Captain Abdulhameed Al Sinani, Most Senior, Head of Team; Bernard Gorman, Supervisor — Austal; John Cooper, Program Manager (Acting); Kutub Chowdhury, Principal Surveyor — DNV GL; and Lieutenant Commander Mubarak Al Kasbi, Staff Officer, Marine Engineer, at the keel-laying ceremony (Photo courtesy Austal)

Austal was awarded a \$US124.9 million contract for the design, construction and integrated logistics support of two HSSVs in March 2014. The vessels are being designed and constructed at Austal’s Henderson shipyard. Construction commenced as planned, with both vessels expected to be delivered in late 2016.

Incat Ferry for London

On 10 December Incat Tasmania announced that it had secured a contract for the construction of a 35 m passenger ferry for operations on the River Thames in London.

The contract was signed by Incat Chairman Robert Clifford and representatives of MBNA Thames Clippers Line Limited. Incat Chairman, Robert Clifford, said “The role of the vessel is to provide rapid passenger transport services on the River Thames in central London on various routes ranging from Putney in the west to Royal Woolwich Arsenal in the east.”

Incat Hull 075 will be designed by One2Three Naval Architects, with assistance from Revolution Design, as a high-speed passenger catamaran ferry.

The vessel will be designed to comply with the HSC Category A with MCA Equivalences appropriate to operation solely in UK Category C waters.



An impression of the 35 m ferry to be built by Incat Tasmania for operation on the River Thames (Image courtesy Incat Tasmania)

General Particulars

Length OA	35.37 m
Length WL	32.45m
Beam	8.30 m
Hull depth	2.15 m
Load draft	1.00 m

Capacities

Passengers	150
Crew	3

Tankage

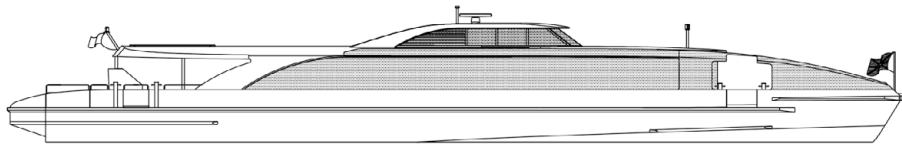
Diesel fuel	2 × 1500 L
Fresh water	500 L
Black water	500 L

Deadweight

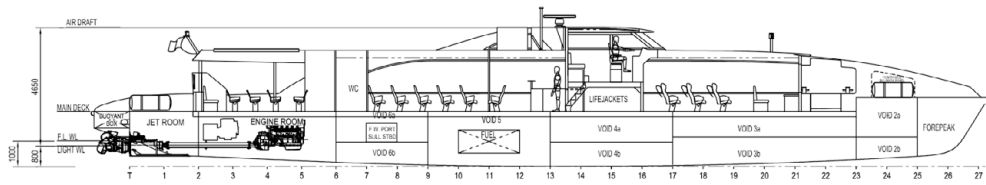
Full load	15.13 t
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Machinery

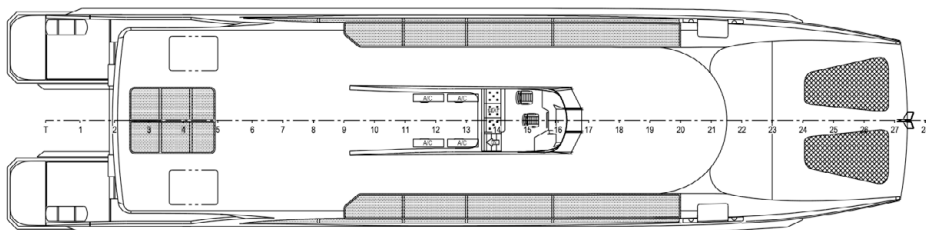
Main Engines	2 × Scania DI16 072M each 625 kW at 2100 rpm
Gearboxes	2 × ZF2000, reversing
Waterjets	2 × Rolls Royce/Kamewa 40A3
Generators	2 × Onan series 35QD



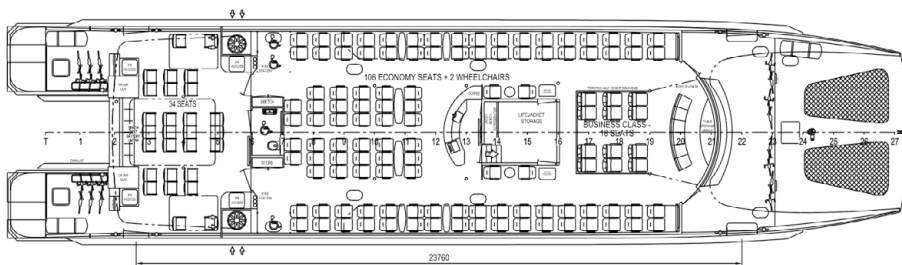
Profile View



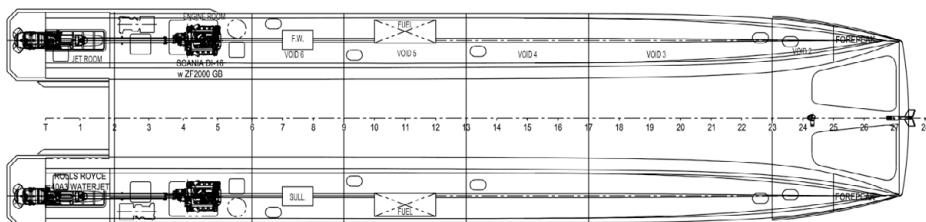
Centreline Profile



Upper Deck



Main Deck



Below Decks

General arrangement of the 35 m passenger ferry to be built by Incat Tasmania for service on the River Thames in London
(Drawing courtesy Incat Tasmania)

New Ferries for Sydney Harbour

Minister for Transport, Gladys Berejiklian, announced in November that the NSW Government is ordering six brand-new modern ferries which will be some of the fastest in the fleet and have a similar look to the very popular First Fleet vessels on Sydney Harbour.

“The NSW Government is delivering new ferries as part of Sydney’s Ferry Future, our 20-year plan to modernise and expand Sydney’s ferry network,” Ms Berejiklian said. “Labor slashed ferry services and failed to plan ahead and order new vessels; today we are getting on with the job of ensuring that customers receive the world-class service which they deserve on Sydney Harbour. The new vessels will be some of the fastest on Sydney Harbour, and will have a modern version look and feel of the very popular First Fleet vessels that are loved by our customers, visitors and tourists.”

The concept design and specifications outlined in the tender were developed using feedback from customers, and expertise from the shipbuilding and maritime industries.

Tenders for the new inner-harbour vessels opened on 28 November 2014 and closed on 16 February 2015. Detailed design and construction of the new ferries will begin in 2015, with the first vessel to be on the water in 2016, Ms Berejiklian said.

“Each ferry will carry up to 400 passengers and some of the great new features include large outdoor viewing areas, around 90 more seats than the current First Fleet vessels, two wide walk-around decks, wi-fi access and real-time journey information.”

The ferries will service all inner-harbour routes, from Watsons Bay in the east to Cockatoo Island in the west, and will use new wharves such as Barangaroo which is expected to be completed in 2016. They will also be used to replace some older vessels in the fleet.

As part of the brand-new Sydney Ferries fleet, the NSW Government is also continuing to look at options to service the Parramatta River, Ms Berejiklian said.

More details of the tender, images and animation of the new vessels are available at www.transport.nsw.gov.au/projects-sydneys-ferry-fleet



Proposed new ferries for Sydney Harbour
(Image courtesy Transport for NSW)



An impression of the interior of the new Sydney ferries
(Image courtesy Transport for NSW)



A deck view of the new Sydney ferries
(Image courtesy Transport for NSW)

Macôco and Panguila from Incat Crowther

Incat Crowther has announced the delivery of *Macôco* and *Panguila* to Instituto Marítimo e Portuário de Angola. The pair of 30 m catamaran passenger ferries, built by Astilleros Armon in Spain, will be operated by subsidiary TMA Express. *Macôco* and *Panguila* are the first deliveries in an aggressive infrastructure-building project which also includes a pair of 36 m ferries—also constructed by Astilleros Armon—to be delivered shortly. Additionally, a 20 m catamaran buoy workboat is also being constructed by the yard Instituto Hidrográfico e de Sinalização Marítima de Angola.

The 136-passenger ferries are IMO HSC Passenger (A) certified and Angola flagged, highlighting Incat Crowther's expertise with international regulations and classification societies. With a multi-lingual staff over three offices, Incat Crowther was also well positioned to service a Spanish-speaking yard and Portuguese-speaking client.

With hard-wearing interiors and simple, practical propulsion packages, *Macôco* and *Panguila* have been designed for efficient long-range operation and low maintenance costs, appropriate for the area of operation. Mechanically-operated fold-down boarding ramps are fitted at the stern quarters, leading directly into the main-deck cabin. The main-deck cabin features seats for all 136 passengers, as well as a bar and three bathrooms, including one that is handicap-accessible.

The hulls accommodate cabins for four crew members, as well as a galley and mess, and a dedicated harbour generator.

The upper deck houses the vessel's wheelhouse, affording 360-degree visibility.

Macôco and *Panguila* are each powered by a pair of Caterpillar C32 main engines, each producing 970 kW and driving through Rientjes gearboxes. Both vessels performed well in sea trials, reaching top speeds of over 27 kn. The vessels have a service speed of 25 kn.

Astilleros Armon has demonstrated that a high-quality aluminium vessel can be built in Europe in a competitive global market. Both the Angola-based operator and Spain-based builder represent new markets for Incat Crowther.

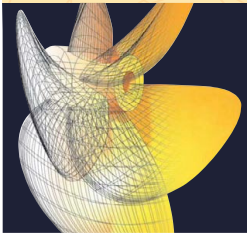

Principal particulars of *Macôco* and *Panguila* are

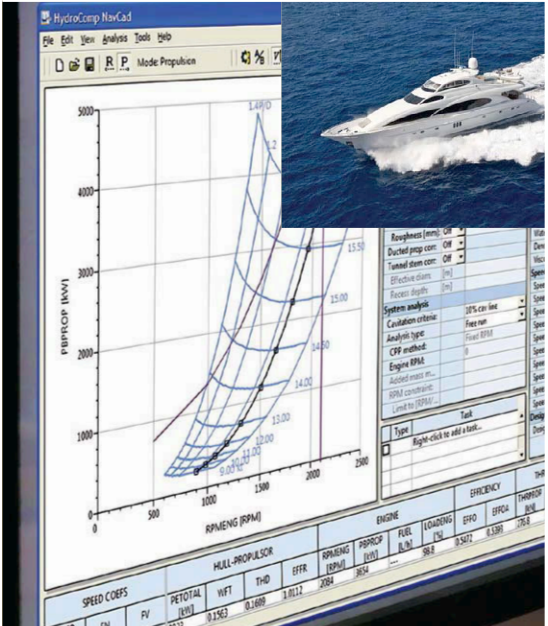
Length OA	30.0 m
Length WL	29.6 m
Beam OA	8.50 m
Depth	3.25 m
Draft (hull)	1.20 m
(propeller)	1.60 m
Passengers	136
Crew	5
Crew berths	4
Fuel oil	4368 L
Fresh water	1756 L
Sullage	2182 L
Main engines	2×Caterpillar C32 each 970 kW @ 1800rpm
Propulsion	2×5-bladed propeller
Speed (service)	25 kn
(maximum)	27 kn

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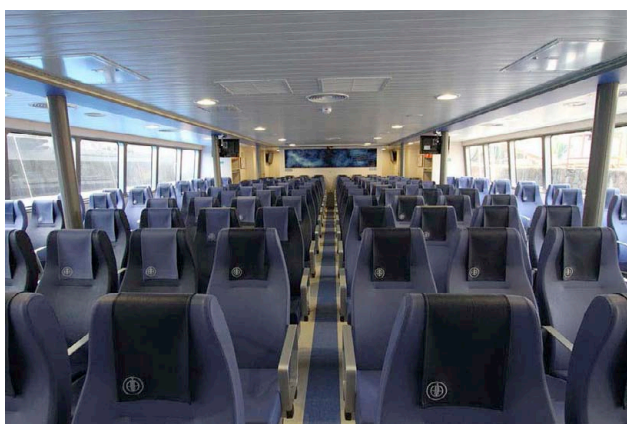
Construction	Marine-grade aluminium
Flag	Republic of Angola
Survey	ABS ✕ A1 © HSC Passenger Craft (A) (Riverine Craft)
	✕ AMS, SHHP



Macôco on trials
(Image courtesy Incat Crowther)



Port Bow of *Macôco*
(Image courtesy Incat Crowther)



Main deck cabin on *Macôco*
(Image courtesy Incat Crowther)

Te Kotuku from Incat Crowther

Incat Crowther has announced the delivery of *Te Kotuku*, a 34 m catamaran passenger ferry for Fullers Group, the operator of the Auckland ferry network. The vessel, constructed by New Zealand builder Q-West in Whanganui, is the result of a thorough review of the network requirements in which Incat Crowther worked closely with Fullers to develop an optimised vessel which suits the network

The Australian Naval Architect

requirements and existing infrastructure as well as offering operational flexibility. *Te Kotuku* is a modern, advanced addition to the Fullers Group fleet and joins recently-refurbished Incat Crowther-designed vessels *Adventurer*, *Wanderer* and *Takahè*.

Te Kotuku's 400 passengers can be accommodated over two decks, in a mix of indoor and outdoor spaces. The main deck seats 192 passengers in the main cabin. A café is located at the rear of the cabin, between a pair of large doorways designed to facilitate fast boarding and egress. Luggage racks have been fitted adjacent to the entry doors for convenience. Lift-up seats and a curtain fitted to port provide for a sick bay in case of emergency. Racks for 14 bicycles have been fitted at the aft end of the main deck, alongside two toilets, one of which is handicap-accessible.

A wide set of stairs leads to the upper deck, where 94 passengers are seated on an open deck protected by a fabric awning. Further bar facilities and a pair of WCs are forward of this, as well as a passenger lounge space accommodating 44 passengers. Additional capacity exists for 70 standing passengers which can be accommodated on the main deck.

At the forward end of the upper deck is an asymmetric wheelhouse which has been designed in consideration of the operational requirements. The frequently-used starboard-wing control station is enclosed for protection from the elements. Conversely, the port side is dedicated to crew access via stairs to the foredeck. The foredeck has been configured to carry palletised cargo, with a Palfinger deck crane fitted for loading and unloading.

Passenger boarding is enhanced by the fitting of large side gates on the main deck, as well as hydraulic hinging articulated ramps mounted on the transom port and starboard. These ramps are designed to integrate with the existing shore-based infrastructure, and offer a fast turnaround time.

Te Kotuku is powered by a pair of Cummins QSK 38 main engines, each producing 1044 kW at 1800 rpm, giving a service speed of 26 kn. The vessel has been fitted with dry exhaust systems which, along with the engine room air outlets, exit high above the upper deck. This configuration, which reduces fumes and noise in passenger areas, is typical of vessels in the Fullers fleet. Manoeuvrability has been enhanced by a bow thruster in the port hull.

Incat Crowther is pleased to be associated with Fullers Group in the delivery of this new vessel for their diverse ferry network.

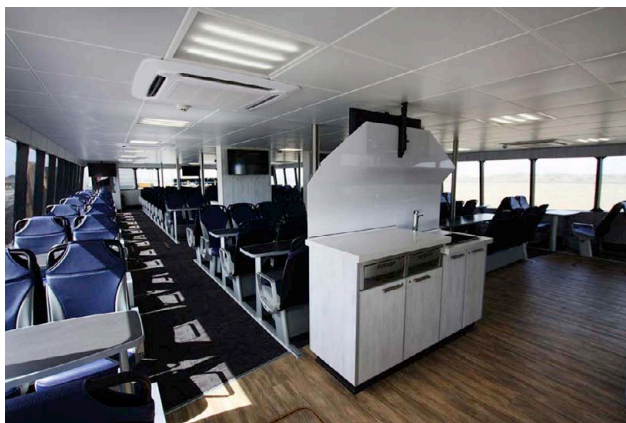
Principal particulars of *Te Kotuku* are

Length OA	34.0 m
Length WL	33.8 m
Beam OA	9.50 m
Depth	3.05 m
Draft (hull)	1.20m
(propellers)	1.80 m
Passengers	330 seated + 70 standing
Crew	5
Fuel oil	8000 L
Fresh water	3000 L
Sullage	3000 L
Main engines	2×Cummins QSK 38 M each 1044 kW @ 1800 rpm
Propulsion	2×fixed-pitch propellers

Generators	2×Cummins 6B-CP each 100 kVA
Speed (service)	26 kn
(maximum)	30 kn
Construction	Marine-grade aluminium
Flag	New Zealand
Class/Survey	Maritime New Zealand



Port Bow of *Te Kotuku*
(Photo courtesy Incat Crowther)



Main deck cabin on *Te Kotuku*
(Photo courtesy Incat Crowther)



Te Kotuku on trials
(Photo courtesy Incat Crowther)

Bhagwan Dryden from Incat Crowther

Incat Crowther's first-of-type catamaran dive-support vessel, *Bhagwan Dryden*, has set a new standard for catamaran dive-support vessels since its launch and delivery earlier last year. Operational feedback has been positive for the vessel, which has already received high praise for initial operations, including mooring inspection carried out by

ROV and operations under four-point mooring and DP in shallow, rough seas.

Developed in conjunction with Bhagwan Marine and built by Keppel Singmarine, *Bhagwan Dryden* is the first catamaran dive-support vessel (DSV) with such a high level of integrated dive systems.

The vessel has been designed from the keel up to perform six key roles: dive support, geophysical survey, geotechnical survey, cargo transport, hyperbaric rescue, and safety standby. The vessel can work in shallow waters, offering operational efficiencies at these depths and is fitted with an ROV, two built-in decompression chambers and two Pommec launch-and-recovery systems, with the diving systems boasting a depth rating of 50 m.

With such a varied array of operational roles, unique solutions were required not only in the allocation of spaces, but also in the specification of a flexible, high-redundancy propulsion system.

The result is an advanced propulsion and powering package which integrates a pair of Schottel STP 550 azimuthing stern drives, azimuthing bow thrusters, and generators. *Bhagwan Dryden* is fitted with four generator sets (two Cummins QSK38-Ms and two QSK19-Ms), overseen by an advanced power-management system which makes optimal use of the four generators and a battery bank to ensure that each power source is used in the most effective way. The battery bank stores enough power to propel the ship for short periods, whilst the generators can be powered up in stages to minimise fuel burn. The system offers both excellent low-speed efficiency (7 kn requires just 25% power) and manoeuvrability with a laden speed of 11 kn.

The QSK 38-M generator sets are also directly coupled to fire pumps which drive full-immersion fire monitors, whilst a separate pump powers a complete deluge system.

The Schottel drives combine with a pair of drop-down azimuthing bow thrusters and a Kongsberg control system to give the vessel DPS-2 manoeuvrability. The innovative system lends itself to shallow-draft dive operations, as the forward azimuthing thrusters are able to maintain operation as tunnel thrusters when retracted. Further positioning capability is provided by a Sonardyne Ranger 2 USBL acoustic positioning system, which allows the vessel to maintain station relative to undersea reference points.

In addition, *Bhagwan Dryden* is fitted with a 100 t four-point mooring system featuring four deck winches and diagonally-oriented fairleads on all four corners of the vessel.

The aft main deck's 160 m² of cargo space, rated at 10 t/m², is supplemented by a multitude of purpose-fitted deck equipment, including launch-and-recovery systems, stern roller, shark jaw, tow pins, A-Frame, waterfall winches and container securing lugs.

Accommodation cabins for a complement of 44 are situated in the hull and on the mid deck. The hull also houses laundry facilities and a gymnasium. The mid deck features an aft-facing survey room which is linked to the wheelhouse by wireways, allowing operational flexibility.

The wheelhouse features complete all-round visibility, including aft-facing DP control stations.

The main deck of the vessel houses service spaces including

an ROV control room and three workshops as well as crew spaces such as a change room, cinema, dining mess and lounges, and a commercial-standard galley adjacent to dry and cold food storage spaces.

Principal particulars of *Bhagwan Dryden* are

Length OA	56.8 m
Length WL	55.8 m
Beam OA	16.0 m
Depth	6.25 m
Draft (hull)	2.50 m
Crew	12
Personnel	28
Aft deck area	160 m ²
Aft deck load	10 t/m ²
Aft deck capacity	150 t
Deck equipment	Deck crane HS Marine AKC245 HE4 35.3 t @ 7.3 m A Frame 22 t (HRC) 45 t (static) 4-point mooring system Launch-and-recovery systems 2×Diver's LARS, 1×ROV LARS Waterfall deck winch Container-securing lugs Stern roller
Fuel oil	132 000 L (long-range tanks) 5 000 L (day tanks)
Fresh water	46 000 L
Sullage	23 000 L
Black water	12 000 L
Generators (prime)	2Cummins QSK38-DM 2×Cummins QSK19-DM
Generator (emergency)	Cummins QSB7
Propulsion	2×Schottel STP 550
Speed (service)	10 kn
(maximum)	11 kn
Construction	Steel
Flag	Australian Maritime Safety Authority/Unrestricted Service
Survey	ABS ✕ A1, ©Offshore Support Vessel (DSV AIR, SPS,FFV1) ✕ AMS ✕ ACCU, ✕ DPS-2, GP, ENVIRO, RRDA



Port bow of *Bhagwan Dryden*
(Photo courtesy Incat Crowther)



Port side of *Bhagwan Dryden*
(Photo courtesy Incat Crowther)

D6 from Incat Crowther

Incat Crowther Has announced the delivery of *D6* to Explore Group NZ, built by Aluminium Marine in Queensland. Construction of the 26 m vessel commenced as a spec. build before quickly being earmarked by the operator as a potential vessel for their Dolphin Discoveries operations.

A close collaboration between designer and builder allowed the vessel's design to be modified to suit Explore Group's requirements with minimal impact on the budget and schedule. The vessel was re-configured to include a sundeck, the seating layout was finalised and Explore Group's trademark yellow paint was specified.

D6's main deck features seating for 116 passengers and a large bar/kiosk. In addition, provision is made for wheelchair spaces. The cabin is light and airy, with large side and forward windows offering excellent visibility. Three toilets are located on the aft deck, one of which is handicap-accessible.

The upper deck features interior seats for 52 passengers, exterior seats for 31 passengers and an additional toilet. The passenger cabin features a forward door, allowing passengers to circulate via stairs to the foredeck.

As well as direct access from both decks, the foredeck is large and features additional handrails to cater for a large number of sightseers.

D6 features a sundeck with seats for 40 passengers.

Powered by a pair of Yanmar 6AYM-WGT main engines, each producing 670 kW @ 1938 rpm, the vessel has a service speed of 25 kn and achieved a top speed of 28 kn on recent sea trials.

D6 demonstrates Incat Crowther's ability to service shipyards requirements, as well as the versatility of the vessels.

Principal particulars of *D6* are

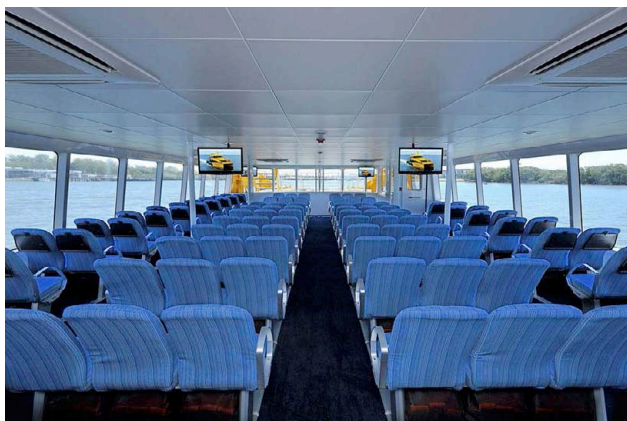
Length OA	26.2 m
Length WL	25.7 m
Beam OA	8.00 m
Draft (hull)	1.20 m
Draft (propeller)	1.80 m
Depth	2.50 m
Passengers	250
Crew	4
Fuel oil	4000 L

Fresh water	500 L
Sullage	500 L
Main engines	2×Yanmar 6AYM-WGT each 670 kW @ 1938 rpm
Propulsion	2×propellers
Speed (service)	25 kn
(maximum)	28 kn
Construction	Marine-grade aluminium
Flag	New Zealand MSA
Class/Survey	NSCV Class 1C

Stewart Marler



Starboard quarter of *D6*
(Photo courtesy Incat Crowther)



Main deck cabin on board *D6*
(Photo courtesy Incat Crowther)

***BS Camburi* from Incat Crowther**

Incat Crowther has announced the launch and delivery of *BS Camburi*, a 36 m monohull crewboat built in Brazil by Arpoador Engenharia to the Petrobras Type P2 specification. Responding to the service provided by Incat Crowther with the design of 48 m crewboats *BS Maresias*, *BS Geriba* and *BS Camboriu*, Arpoador called upon Incat Crowther to provide a design for their third P2 vessel.

The vessel's aft main deck features a large open deck, separated for two main purposes. The aft portion, measuring 60.5 m², is dedicated to a man-riding basket. The forward portion, measuring 28 m², is dedicated to cargo, with large cargo rails offering heavy-duty protection.

The main-deck passenger cabin houses 60 seats in a mixture of forward-facing and booth styles. Ample luggage storage is also provided, along with a pair of heads and a beverage counter.

A sturdy and safe bow-loading platform is integrated into the design to facilitate passenger embarkation and

disembarkation from offshore facilities. This is served directly from a large, sheltered door and companionway at the forward end of the passenger cabin.

Served by a stair tower aft with direct access to all decks, *BS Camburi*'s wheelhouse features forward and aft control stations.

The hull accommodates 10 crew in five cabins, alongside a galley, crew mess and bathrooms.

BS Camburi is fitted with a trio of Caterpillar C32 main engines, coupled to Doen DJ290 waterjets. The centre engine drives a 600 m³/h fire pump. On sea trials, *BS Camburi* achieved a top speed of 25 kn. She has a fully-loaded service speed of 17 kn.

Principal particulars of *BS Camburi* are

Length OA	36.0 m
Length WL	33.0 m
Beam OA	7.50 m
Depth	3.50 m
Draft (hull)	1.20 m
Passengers	60
Crew	10
Deck area	28 m ²
Deck load	50 t
Deck strength	2.5 t/m ²
Ship's fuel oil	15 000 L
Cargo fuel oil	30 000 L
Ship's fresh water	5800 L
Cargo fresh water	30 000 L
Black water	1250 L
Grey water	2500 L
Main engines	3×Caterpillar C32
Propulsion	3×Doen DJ290 waterjets
Generators	2×60 kW
Speed (service)	17 kn
(maximum)	25 kn
Construction	Marine-grade aluminium
Flag	Brazil
Class/Survey	RINA

Zach Dubois



BS Camburi shows her paces
(Photo courtesy Incat Crowther)



BS Camburi demonstrating her manoeuvrability
by turning in her own length
(Photo courtesy Incat Crowther)

Cruising

The summer cruise season has moved into high gear, with visits to Sydney in late November by *Diamond Princess*, *Carnival Legend*, *Rhapsody of the Seas*, *Celebrity Century*, *Carnival Spirit*, *Pacific Jewel*, *Oosterdam*, *Pacific Pearl*, *Volendam*, *Radiance of the Seas*, *Pacific Dawn*, *Crystal Symphony*, *Sun Princess*, and *Celebrity Century*.

In addition to returns by many of these vessels, December added visits by *Voyager of the Seas* and *Seabourn Odyssey*, January added visits by *L'Austral*, *Europa*, *Seven Seas Mariner* and *Silver Whisper*, and early February added visits by *Astor*, *Marina*, and *Asuka II*.



Celebrity Solstice at the Athol Bight mooring on 22 December. Because of the shortage of large passenger ship berths in Sydney, she had moved there from Circular Quay to allow *Celebrity Century* to take her place at the Overseas Passenger Terminal. Both ships sailed that evening
(Photo John Jeremy)



Submarine Design & Engineering Course

The BMT Design and Technology *Submarine Design & Engineering* course is ideal for delegates who are currently, or are considering working on submarine projects.

The course is certified by The Royal Institution of Naval Architects and meets the requirements for Continuing Professional Development.

Course Content

- Submarine Roles and Operations
- Modern Conventional Submarines
- The Weapon Platform
- Naval Architecture
- Propulsion Systems
- Command and Control Systems
- Hull Systems
- Design & Safety
- Systems Integration

Date:	May 4th - May 8th, 2015
Location:	Adelaide (Venue TBC)
Fee:	\$5300 inc. GST, meals & and course material.
Registration:	Karyn Agius kagius@bmttdt.com.au, +61 3 8620 6171

For more info visit: www.bmtdesigntechnology.com.au/training-courses

 **BMT Design & Technology**
"Where will our knowledge take you?"

Port Ash

Introduction

The Australian Ship Handling Centre at Port Ash provides training in ship handling for masters, ship's officers and pilots, using experienced pilots as instructors. This ship-model simulator is a purpose-built facility and specialises in the practical aspects of ship handling and the control of ships at low speeds in confined and shallow waters with and without tug assistance. The centre utilises manned ship models to provide practical hands-on training on its purpose-built 2 ha lake at Port Ash, located 45 km north of Newcastle, NSW, on the western side of the Pacific Hwy, about half-way between Raymond Terrace and Karuah.

The centre was built and set up by owner Captain Cliff Beazley and son Andrew. Cliff is a retired master mariner who served with Blue Funnel Line (UK), MacAndrews (UK), Howard Smith Industries (Australia, with three years as master) and the Newcastle Pilot Service (27 years, including eight years as Check Pilot in the Port of Newcastle). He has extensive experience handling ships ranging from tugs to VLCCs. Cliff is now the Chief Instructor, and Andrew the General Manager at the ASH Centre.

The centre now trains about 120 personnel per year, of which about one-third are navy.



Port Ash from the air
(Image courtesy Cliff Beazley)

The Facility

Port Ash comprises the lake with various depths, a curved channel, manoeuvring basin, boat shed, workshop, classroom and amenities, and the owner's house.

Some of the models are built on-site in the workshop, while some of the most complex ones are contracted out. The workshop takes care of all repairs, modifications and maintenance.

The ship models are mostly built to a scale of 1:25 and include a handymax bulk carrier, a panamax bulk carrier (*Mentor*), a generic twin-screw warship, a generic handysize bulk carrier, and a landing ship dock with azimuthing pods. These vessels all have bow thrusters fitted and some also have stern thrusters. In addition there is a trans-shipper barge with twin-harbourmaster units, and a 12 000 t dumb cargo barge. However, their pride and joy, an 11.5 m model of the RAN's new LHDs, *Assault*, is built to a scale of 1:20, complete with azimuthing propulsion pods and twin bow thrusters. All of the ship models carry the operator on board.

There are eight remotely-controlled tug models, all built to a scale of 1:25 but with adjustable bollard pulls. Four have

conventional (straight-line) drive, three have azimuthing stern-drive units, and one has azimuthing tractor (forward) drive units. There is one manned tug model with azimuthing stern-drive units to a scale of 1:16, but powered for a scale of 1:25.

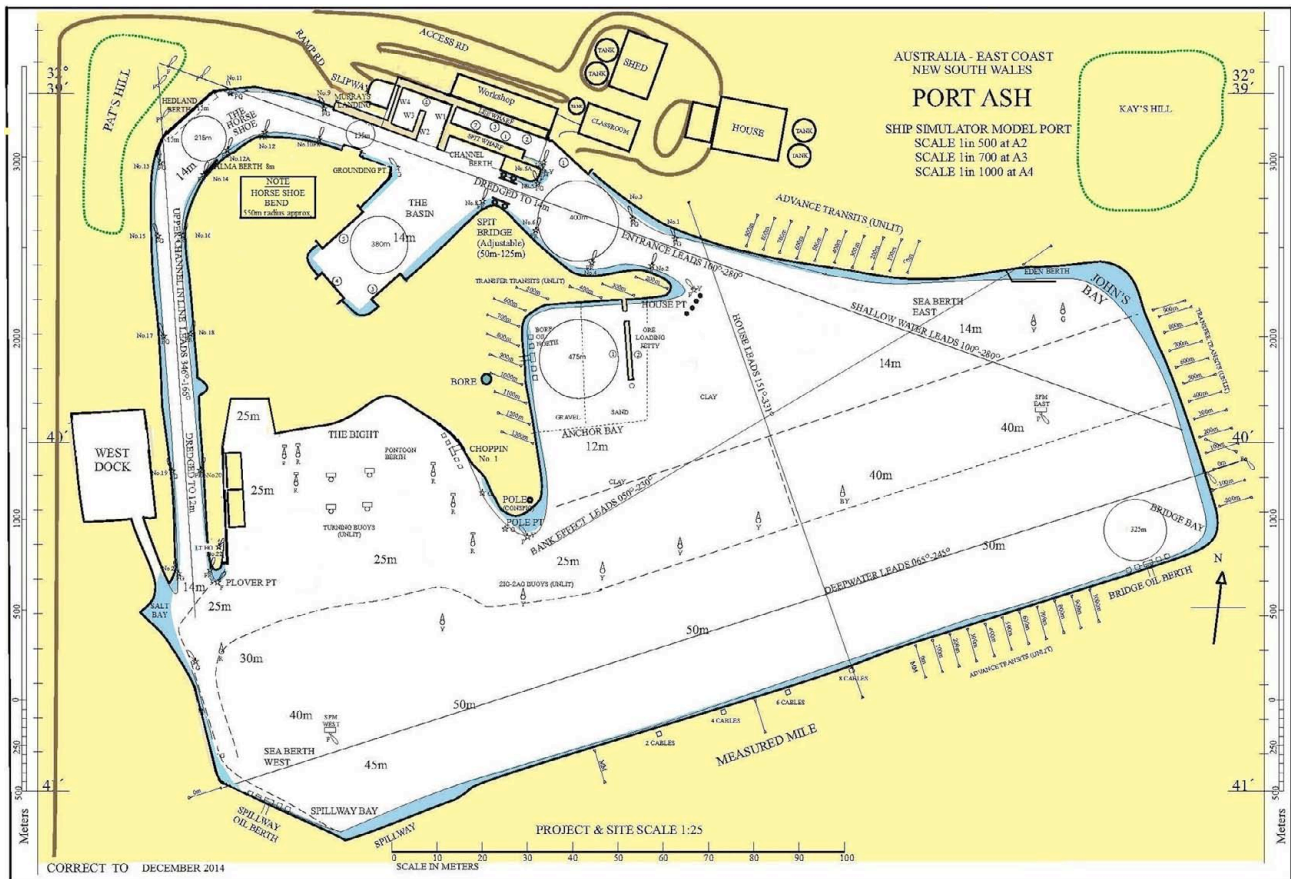
One of the interesting things about operations at model scale is that the time scale is accelerated in the inverse ratio of the square root of the scale. For a scale ratio of 1:25, at model scale things happen in one fifth of the time that they do at full size. You therefore have to concentrate at the controls to ensure that a minor steering or propulsion error does not turn into a grounding!



Models in the boat shed
(Photo Phil Helmore)



Mentor leaving the boatshed with tug assistance
(one radio-controlled, one manned)
(Photo courtesy Cliff Beazley)



Port Ash Chart
Note: distances and depths are shown at full size
(Chart courtesy Cliff Beazley)



Assault arriving at Port Ash
(Photo courtesy Cliff Beazley)



Assault under way at Port Ash
(Photo courtesy Cliff Beazley)



Assault launching at Port Ash
(Photo courtesy Cliff Beazley)



Radio-controlled tugs in the workshop
(Photo Phil Helmore)

Courses

The Centre currently enrolls four trainees for each weekly course. It is necessary for trainees on manned ship-model courses to attend in pairs, as the accelerated time scale inherent in ship-model simulation requires intense concentration such that trainees must work alternately in manoeuvres.

The Centre has Registered Training Organisation status and is established under the Skills Centre Program of the New South Wales Department of Education and Training, with funding assistance provided by the Australian National Training Authority.

The Centre has a Vocational Education Training Accreditation Board (VETAB) nationally-accredited course entitled "Course in General Ship Handling for Delivery on a Ship-Model Simulator14464".

This course also complies with relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1995 (STCW95).

Satisfactory completion of the course leads to the issue of a National Recognised Statement of Attainment.

Unit	Title
1	Ship-Model Operations
2	Single Buoy moorings and Floating Storage Vessels (Elective)
3	Wind Effects
4	Current Effects
5	Shallow Water Effects
5	Bank/Channel Effects and Ship Interaction
7	Underway Cargo Transfer (Elective)
8	Use of Anchors and Rudders
9	Tanker Sea Berth Operations (Elective)
10	Use of Thrust Units
11	Tug Operations
12	Channel Turning and Berthing Manoeuvres
13	Emergencies, Contingencies and Exceptional Circumstances

Other courses and activities can be designed to suit client specifications.

The Centre is committed to employing only instructors who are experienced pilots.

Other Ship Handling Facilities

Port Ash is one of a very select group of ship-handling simulators using models in the world. The only other known ones are

- Port Revel near Grenoble in France, run by Artelia. This was the first in the world, and all the models are at 1:25 scale. They include 11 ships (representing 20 vessels) and five tugs and are run on a 5 ha lake.
- Timsbury Lake at Romsey in the UK, run by the Warsash Maritime Academy. Models are mostly at 1:25 scale, but some are at scales of 1:15, 1:30 and 1:40. Nine ship models (which are reconfigurable) include an LNG carrier, a bulk carrier, a car carrier and a ro-ro ferry. They also have four radio-controlled tugs.

- Great Herring Pond at Sagamore in Massachusetts, USA, run by the Massachusetts Maritime Academy. The models are at a scale of 1:16.
- The Ship Handling Research and Training Centre at Ilawa, Poland, run by the Foundation for Safety of Navigation and Environment Protection. Models include ULCCs and VLCCs, container ships, ro-ro vessels and LNG carriers, and tugs.

Clients

The clients of Port Ash include both national and international port authorities:

Darwin Port Corporation	Maritime Safety Queensland
Houston Pilots	Swire Pacific Ship Management
Wyndham Port ORDC	Teekay Shipping Australia
Port Hedland Pilots	ASP Ship Management
Flinders Australia	Esperance Port Authority
Newcastle Port Corp.	Brisbane Marine Pilots
Geraldton Port Authority	NSW Roads and Maritime Services (Yamba and Eden)
Western Geco	Australian Transportation Safety Bureau
Chevron Texaco	Sydney Pilot Service
Trident Shipping (Shell)	Defence Maritime Services (Sydney)
Alcan Gove	Port Phillip Sea Pilots (Melbourne)
Gemco (Groote Eylandt)	Woodside (Withnell Bay)
Royal Australian Navy	Port Kembla Port Corporation
Burnie Port Corporation	South West Alaska Pilot Association
Stolt NYK Australia	Port of Napier (New Zealand)
Fremantle Pilots (Western Australia)	

Further Details

For further details of Port Ash, check out the website at www.portash.com.au, or contact Captain Cliff Beazley by phone on (02) 4987 0029 or email cliff.beazley@portash.com.au. For general enquiries, training enquiries and bookings, contact training@portash.com.au.

Phil Helmore

EDUCATION NEWS

Australian Maritime College

New AUV Facility at AMC

World-leading research at the Australian Maritime College, a specialist institute of the University of Tasmania, will allow the nation to capitalise on the robotic age of Antarctic exploration.

The \$24 million Antarctic Gateway Partnership, launched by the Australian Government in November 2014, includes \$7.5 million to establish a marine technology hub to build next-generation hybrid autonomous vehicles capable of exploring hundreds of kilometres under metres-thick ice.

Leading this research and development is AMC's autonomous underwater vehicle (AUV) and fluid mechanics expert Dr Alex Forrest.

"Tasmania has a real critical mass in terms of Antarctic research, robotic or otherwise, that we are capitalising on through this project," Dr Forrest said.

"There are four main areas of research in the Antarctic Gateway Partnership — ice-shelf cavities, marine biology, solid earth and marine technologies. We'll be leading the marine technologies theme and developing a new AUV which can go underneath ice cavities, sample the biology and provide feedback for all the other themes."

Work is underway to establish the AUV facility at the AMC in Launceston, including the recruitment of four new positions. The aim is to research, design and build the robots over the next three years in readiness for deployment in 2018, the final year of the project.

"We'll be looking at what the interesting science questions are and how an AUV facility can develop multiple types of vehicles with the support staff necessary to target those projects," Dr Forrest said.

"One of the biggest challenges now is the conceptual design phase. We need to build a vehicle and we need to build it quickly, so what instruments do we need on board? What are the attributes which we want the vehicle to have? In essence, these robots are relatively simple in design, but it's their range, capabilities, instruments and data sensors that we want to expand upon in a novel way."

Dr Forrest has spent nearly a decade specialising in under-ice deployments in the Arctic and Antarctic. Most recently, he was part of an international research expedition to Antarctica in October 2014 where he studied algae growth underneath sea ice using the AUV *UBC-Gavia*, a vehicle based at AMC.

The project is a collaboration between AMC and the Institute for Marine and Antarctic Studies (University of Tasmania), the University of Canterbury (New Zealand), and Aarhus University (Denmark), with funding from the New Zealand Antarctic Research Institute.

It aimed to compare measurements taken above ice using traditional ice coring techniques with measurements made below the ice with the AUV. The seven-member team spent 21 days at Cape Evans in the New Zealand-managed territory accessed from Scott Base conducting their investigations.

"We're trying to understand the dynamics of algae growth and distribution because these organisms are the first step in

the Southern Ocean ecosystem. So in order to understand the productivity of this system in under-ice conditions, we need to understand the distribution of the ice algae," Dr Forrest said.

Robotic under-ice sampling is far more efficient and accurate than traditional methods — divers are limited to operating within a 20 m radius of the drilled hole and core sampling gathers data from single locations. Robots can be used for broadscale measurements that capture any horizontal variability, rather than estimating it based on fixed point sampling.

"This AUV has very expensive navigation equipment that estimates its exact location, providing the longitude and latitude for every measurement down to centimetre accuracy. So we know exactly where we are when we're taking a measurement and from that we can build three-dimensional spatial maps," he said.

While *UBC-Gavia* has a relatively short range of 20 to 30 km, the aim of the new AUV facility is to develop a fleet of robots fitted with an array of scientific sensors and capable of travelling much longer distances.

It's an ambitious project and one that is not without risk.

"While working under ice is ideally suited for robotic exploration, it poses significant environmental challenges that require innovative engineering solutions," Dr Forrest said.

"Every time we deploy we have unexpected challenges; however, what makes a good team is how they respond and overcome these challenges."

The Antarctic Gateway Partnership will complement research programs and priorities developed in Australia's Antarctic Science Strategic Plan to understand the role of Antarctica and the Southern Ocean in the global climate system.

In addition to the establishment of a marine technology hub, the \$24 million project includes the development of a sea-ice charting service for polar mariners in east Antarctica and an increase in the number of Australian scientists working in Antarctica.

The three-year project is funded by the Australian Research Council and brings together the University of Tasmania's Institute for Marine and Antarctic Studies and Australian Maritime College, CSIRO's Oceans and Atmosphere Flagship, and the Australian Antarctic Division.



Dr Alex Forrest with the autonomous underwater vehicle *UBC-Gavia* on a research expedition to Antarctica in October 2014
(Photo courtesy AMC)

University of New South Wales

Undergraduate News

Naval Architects' Annual Dinner

With the passing into history of the Thesis Conference Dinner, the third Naval Architects' Annual Dinner was held on 18 November at Giovanna's Italian Restaurant in Kingsford, and was attended by most of the final-year naval architects along with staff Lawry Doctors, David Lyons and Phil Helmore.

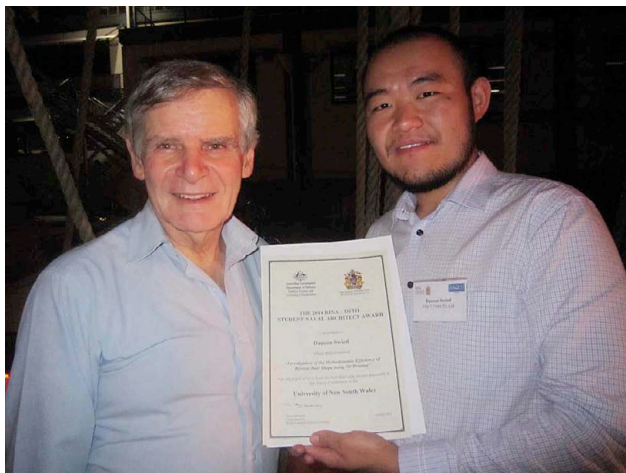


Naval architects enjoying their Annual Dinner
(Photo courtesy Giovanna's Restaurant)

RINA-DSTO Award

RINA and the Defence Science and Technology Organisation (DSTO) jointly offered an award of \$125 and a certificate for the best presentation at the Thesis Conference by a student member on a naval architectural project. Assessment was made on the basis of marks awarded by School staff. The award went to Dauson Swied for his presentation on *Investigation of the Hydrodynamic Efficiency of Reverse Bow Shape using 3D printing*. The certificate and cheque were presented to Dauson at by the Naval Architecture Stream Coordinator, Phil Helmore, at SMIX Bash 2014 on board *James Craig* on 4 December.

Congratulations, Dauson!



Phil Helmore presenting the RINA-DSTO Award to Dauson Swied
(Photo courtesy Helen Wortham)

Thesis Projects

Among the interesting undergraduate thesis projects recently completed are the following:

Automated Drawing of Ship Hullforms

Creating a hullform for a new design from scratch using software such as Maxsurf Modeler or AutoSHIP is usually an iterative process, especially in obtaining fairness of the form.

Fergus Hudson has conducted an investigation of automating the fairing process, using generic algorithms. He found that polynomials, while giving good body-plan sections, did not give fair waterlines. However, switching to splines gave good results in all views, and are to be preferred.

Feasibility of Solar Panels for Merchant Vessels

Rising fuel prices present a major problem for the shipping industry and installing solar panels on ships can help to alleviate the fuel price hike. However, it is unknown whether installing solar panels is economical in the short or long term.

The cost of installing solar panels for various power-generation capabilities on merchant ships has been investigated by Asiff Sabri, calculating the cost for installing, operating and maintaining solar panels for durations of 5 and 20 years, and comparing the results with the cost of using diesel engines for the same power. The installations onboard were investigated and he found that solar power is economically advantageous for auxiliary power, both in the short and long terms, and can significantly reduce emissions as well.

Revised Stream Structure Completes Rollout

The revised degree stream structures, resulting from the review by Em/Prof. John Simmons in 2011 and which commenced rolling out for Year 1 and 2 students in 2012, rolled into Year 4 last year and completed the new structure. Fortunately, this has meant minimal change to the naval architecture stream, although other streams have changed more and, especially, mechatronic engineering.

For naval architecture, the changes can be summarised:

- The two Year 1 Engineering Elective courses become truly elective (rather than MMAN1130 and MATS1101 being strongly recommended).
- MMAN1130 Engineering Design and innovation moves to Year 2 as a core course, MMAN2130.
- MATH2089 Numerical Methods and Statistics moves to Year 3.
- MMAN4000 Professional Engineering moves to Year 3 as MMAN3000.
- The Year 3 General Education course and MMAN3200 Linear Systems and Control move to Year 4.

Details of the old and new stream structures are shown on the School website at

www.engineering.unsw.edu.au/mechanical-engineering/naval-architecture-program-outlines

Feedback from students in Years 1, 2 and 3 so far has generally been positive.

New Engineering Programs

Students enrolling in Year 1 of any engineering degree program in 2015 will enrol in a new program, 3707 Bachelor of Engineering (Honours), compared to the current program for this school, 3710 Bachelor of Engineering.

This change has been brought about by the fact that the award of honours is "embedded" in the program, and awarded on the basis of performance in the program, compared to other degrees which require a separate year to undertake the honours component. It also brings UNSW Australia into line with other universities both within Australia and around the world.

A major difference is that all students enrolled in this program will graduate with “Bachelor of Engineering (Honours)” on their testamur, and the class of honours awarded will be stated for those to whom it applies. Another difference is that the weighted average marks (WAM) for all grades of honours will be increased by 5 points to bring them in line with other universities.

The structure of the naval architecture stream remains unchanged from the revision above.

Staff Changes

Phil Helmore, who has been lecturing at UNSW since 1991, is now transitioning to retirement and, as of Semester 1, will be teaching two days per week, coordinating NAVL4120 Ship Design Project A and NAVL4130 Ship Design Project B, and supervising some thesis projects. He steps down from his positions as Director of Undergraduate Teaching and Naval Architecture Stream Coordinator in the School.

David Lyons, who commenced full-time at UNSW in August 2014, takes over as the Naval Architecture Stream Coordinator, and coordinates NAVL3610 Ship Hydrostatics and Practice, NAVL3120 Ship Design and Propulsion, NAVL3620 Ship Hydrodynamics, and NAVL3710 Ship Standards and Marine Engineering.

Mac Chowdhury continues coordinating NAVL3410 Ship Structures 1 and NAVL4410 Ship Structures 2. As a result of student pressure, finite-element methods was retained as part of NAVL4410 on the death of MMAN3540 Computational Engineering.

Post-graduate and Other News

Awards

Prof. Anne Simmons, Head of the School of Mechanical and Manufacturing Engineering, received a 2014 UNSW Staff Excellence Award jointly with Prof. Eliambathy Ambikairajah, Head of the School of Electrical Engineering and Telecommunications, for Excellence in Senior Leadership.

Prof. Liangchi Zhang has been re-appointed as a Scientia Professor for 2015.

Building Progress

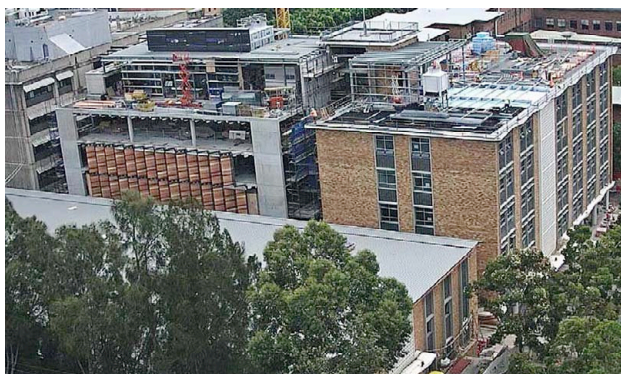
The installation of terracotta panels on the new Link Wing commenced in December and is now complete. The panels give the Precinct a unique and contemporary look in 2015. J17 (the tutorial building) and J18 (the laboratory building) have been made completely watertight. Achieving this was a challenging process, particularly in J17 North where all the existing windows were replaced whilst maintaining the classic 1960s architectural style of the building. The new window system will provide long-term benefits for the University, by providing better sound, thermal, and wind insulation for the building.

The wind tunnels in the J18 South Aerodynamics Laboratory have received a much-needed revitalisation. Careful restoration and painting works has ensured that the tunnels match the new, modern style of their surroundings in the south end of the Willis Annexe.

The new café for the ground floor of J17 North has taken shape. Upon completion, the café and surrounding area will provide an informal space to meet friends and colleagues,

The Australian Naval Architect

with views of both the peaceful John Lions Garden and bustling University Mall.



The new Link Wing (C) showing some terra cotta panels in place in early December, flanked by CSE (L), MME (J17, R) and the laboratory building (J18, foreground)
(Photo courtesy UNSW)

New Dean of Engineering

Prof. Graham Davies, who has been Dean of the Faculty of Engineering for seven years, has moved back to the UK.

Prof. Mark Hoffman has been appointed as the new Dean of the Faculty of Engineering. Prof. Hoffman has been the University's Pro-Vice-Chancellor (Research) since 2012. He was previously Associate Dean (Research) in the Faculty of Science and Head of the School of Materials Science and Engineering. Prof. Hoffman first joined UNSW as a lecturer in 1997 following appointments at UC Berkeley in the US, the Technical University Darmstadt in Germany, and in Japan. He has a leading international research reputation and a record of building high-performance research teams and has also received a number of teaching awards.

Professor Hoffman said: “I am proud to lead Australia's largest and most respected engineering faculty at a time of great opportunity.”

New Vice-Chancellor

Prof. Fred Hilmer, who has been President and Vice-Chancellor of UNSW Australia for eight years, has retired from the position.

Prof. Ian Jacobs has been appointed President and Vice-Chancellor of the University. Prof. Jacobs was previously Vice-President and Dean of the Faculty of Medical and Human Sciences at the University of Manchester and Director of MAHSC (the Manchester Academic Health Science Centre).

“This is an outstanding appointment for the University,” the Chancellor, Mr David Gonski, said. “Professor Jacobs has a significant record as a strategic leader, with more than a decade of leadership experience gained at two of the world's elite research intensive universities. He also has an international reputation as a world class researcher.”

Prof. Jacobs' appointment was the result of a global recruitment process over many months. “The position was highly contested, with a number of candidates from both Australia and internationally. This is a tribute to Prof. Hilmer's distinguished leadership, which has left UNSW in such a strong position,” said Mr Gonski.

Prof. Jacobs said that he was excited and delighted to be taking up what he sees as a challenging and highly-prestigious role.

Phil Helmore

THE PROFESSION

AMSA Surveyor Accreditation Scheme

The Marine Surveyor Accreditation Scheme, managed by the Australian Maritime Safety Authority (AMSA) as the National Regulator, ensures that people are competent to conduct and provide survey reports for domestic commercial vessels under the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* (National Law).

The regulation amendment commenced on 2 January 2015 and will be administered by AMSA. This mechanism developed from a recent amendment to the regulations — *Marine Safety (Domestic Commercial Vessel) National Law Amendment (Surveyor Accreditation) Regulation 2014*, which is available from <http://www.comlaw.gov.au/Details/F2014L01541>.

The creation of the regulation amendment is the product of extensive consultation with the various state and territory maritime agencies and representative bodies, including the Australasian Institute of Marine Surveyors (AIMS), the International Institute of Marine Surveying (IIMS), the Royal Institution of Naval Architects (RINA) and the Boating Industries Alliance Australia (BIAA), classification societies and the Australian Maritime College (AMC), to name a few. It has been developed to cater for the needs and expectations of AMSA, its delegates, private operators and other external industry stakeholders.

The scheme includes some important features:

- a cost-neutral approach, providing existing government and non-government surveyors a simple renewal processes to allow them to continue to work;

- a direct route for new government surveyors into the accreditation scheme based on existing delegates' recruitment and employment practices;
- a straightforward route for new non-government (private) surveyors to achieve accredited status, with a career path for surveyors who upskill; and
- a robust and transparent governance mechanisms which include auditing and centralised coordination of the scheme, that will ensure a high quality of output in order to maintain the integrity of the national system.

AMSA has already started accepting applications for accreditation from 2 January 2015 and will be running a series of information sessions in Queensland and New South Wales during February and March, and in other locations by request.

The Queensland information sessions have already taken place in Cairns, Noosa and the Gold Coast during the week of February 9 – 13 February 2015. Additionally, a NSW information session will be held in Sydney on Monday 16 March 2015, from 9 am to 11.30 am at the Y Hotel (Mezzanine A Room), 5–11 Wentworth Avenue.

For further information on how to make an application, register your attendance for an information session or to request an information session in your area, contact AMSA at devsurvey@amsa.gov.au. Further information can be found in the *Marine Surveyors Accreditation Guidance Manual 2014* which is available on the AMSA website — www.amsa.gov.au/domestic/surveyors-manual.

Renee Duarte

THE INTERNET

Webcasts of NSW Section Technical Presentations

Engineers Australia records selected technical presentations made to RINA (NSW Section) and IMarEST (Sydney Branch) for webcasting. The recordings are placed on the Engineers Australia website, usually within a few days of the presentation.

All of the recorded webcasts up to 30 September 2014, together with hotlinks to each one, are listed at

www.rina.org.uk/NSWwebcasts.html.

However, on 1 October 2014, Engineers Australia started using a new system for recording presentations, using three cameras and a hand-held microphone, with an audio technician in attendance. Webcasts are placed on the Engineering On Line (EOL) website at

www.engineeringonline.com

To access the recording (and all future recordings), you will have to register once with EOL (it is free), and then login. Go to the URL above with your favourite browser, and click on Sign Up at the top right. In the Basic column, tick the box if you are a member of Engineers Australia, or leave blank if not, and then click Sign Up. Fill in all the required details, tick the box for having read and agreed to Terms and

Conditions and Privacy Policy, and click Next. Follow the prompts. You will be sent an email, and you then have to click on the link in the email to activate the account.

The first presentation to be recorded with this new system was Graham Taylor's presentation on *LNG — The New Marine Fuel?* on 1 October. The presentation is now up on the EOL website at

www.engineeringonline.com/video/xjkrdrf/lng-the-new-marine-fuel

and, having activated your new account, you should be able to login at this URL and see the presentation. You will also be able to see future presentations by just logging in, without having to go through the registration process again. You will also be able to search for and view other EA presentations.

Phil Helmore



The remarkable maxi-yacht, *Wild Oats XI*, won line honours in the 2014 Sydney to Hobart yacht race for a record the eighth time. Sailed by Mark Richards, she is seen here manoeuvring before the start
(Photo John Jeremy)

THE ROLEX SYDNEY TO HOBART YACHT RACE 2014

THE VIEW FROM A COMMITTEE BOAT



Competing yachts reporting in to a committee boat prior to the start with their storm sails rigged for inspection
(Photo John Jeremy)



Syd Fischer's modified 30.3 m *Ragamuffin 100* displaying her speed amongst the yachts manoeuvring before the start
Ragamuffin 100 was third over the finish line
(Photo John Jeremy)



Sean Langman's *Maluka of Kermadec* was the smallest and oldest yacht in the race. Built of Huon pine 80 years ago, she finished 101st over the line but third in IRC Division 4, second in IRC Veterans 30 year and third in IRC Veterans 20 year (Photo John Jeremy)



Start line 3 shortly after the starting signal. *Brindabella* (10000) was forced to retire with gear damage (Photo John Jeremy)

INDUSTRY NEWS

Saab, Damen Jointly Pursue Submarine Contracts

Swedish defence and security company, Saab, has partnered with the Dutch shipbuilder, Damen Shipyards, to explore future opportunities in the international submarine market, signing an exclusive teaming agreement to work together in pursuit of the potential Walrus-class submarine replacement program for the Netherlands. Additionally, Saab and Damen will also explore ways in which they might bid jointly on other submarine procurement programs.

Through the acquisition of Kockums, Saab has experience in the design and manufacture of submarines and surface vessels for a global customer base, integrating advanced systems and using a range of ultra-modern materials and construction techniques. Key technology includes Saab's unique Air Independent Propulsion System based on the Stirling engine. In addition, Saab delivers many complex defence programs in cooperation with governmental and commercial partners in customer nations worldwide.

Damen delivers about 160 vessels annually and is known for its unique ship design concepts, due to its focus on research and development, standardisation and modularisation. Its defence and security portfolio includes vessels ranging in size from 7 m to over 200 m. Damen Schelde Naval Shipbuilding, established in 1875, supplies major surface vessels to navies worldwide.

Hein van Ameijden, Managing Director of Damen Schelde

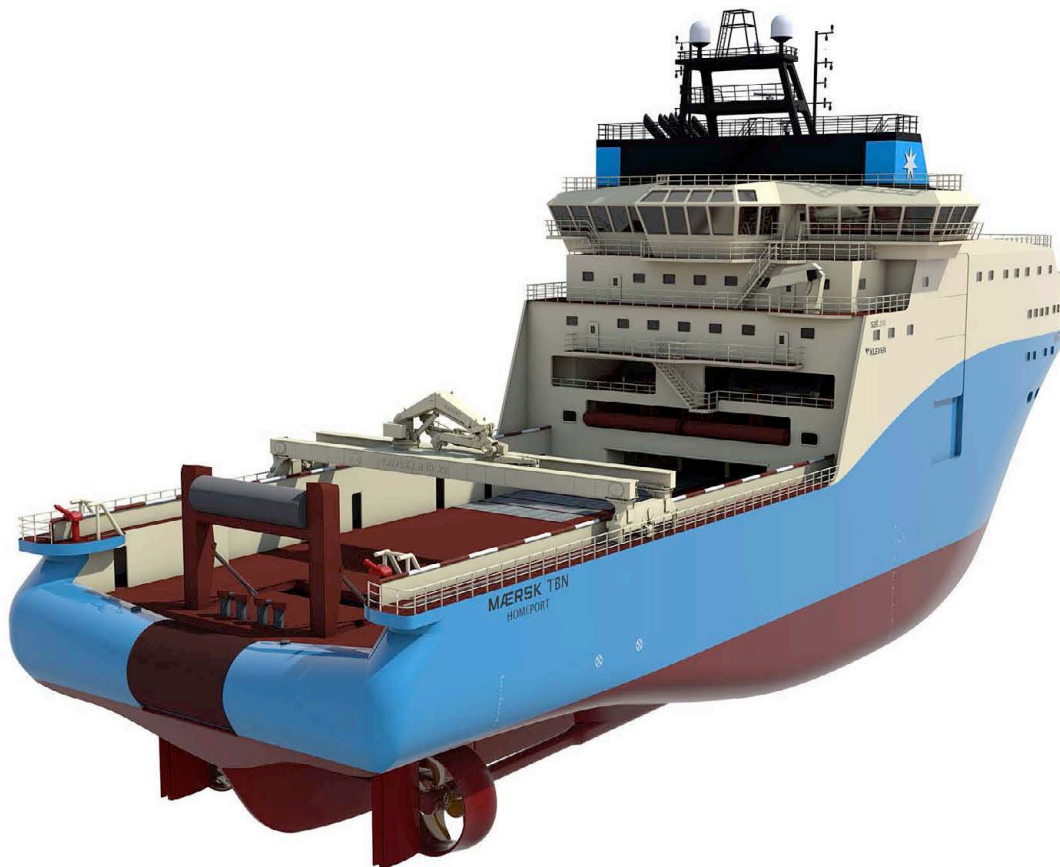
Naval Shipbuilding, said "We are convinced that, with Saab, we have found the ideal partner to realise a successor to the present Walrus class; a vessel which will set a new standard for non-nuclear submarines. The complementarity of both our companies opens up the potential for a successful cooperation in more submarine programs worldwide."

Gunilla Fransson, head of the Saab business area, Security and Defense Solutions, said "Saab Kockums is looking forward to cooperating with the experienced shipbuilders at Damen Schelde Naval Shipbuilding. We have the full support of our Swedish customer in broadening our customer base to include a new demanding high-end customer."

Wärtsilä Integrated Solutions for Anchor Handling Tug Supply Vessels

A new series of six Anchor Handling Tug Supply vessels to be built at the Kleven Verft AS in Norway for the Danish-based Maersk Supply Service A/S — part of the A. P. Møller-Mærsk Group — will feature fully-integrated solutions from Wärtsilä. There is an option for an additional four vessels within this series. The contract with Wärtsilä was signed in November.

The 95 m long vessels will be utilised in deep-water offshore oilfield operations, with reliability, safety, and uptime specified as being priority requirements. Wärtsilä's responsibility encompasses the complete power-generation solution, electrical distribution and drives system, vessel automation system, and propulsion system. All these systems



Six new anchor handling tug supply vessels will feature fully integrated solutions from Wärtsilä
(Image courtesy Wärtsilä)

will be fully integrated to provide optimal power, efficiency, versatility and redundancy, while having the lowest operating expenditures and a minimal environmental impact. In addition, Wärtsilä will supply comprehensive project services, including project management, engineering, yard support and commissioning. The vessels' power-generation solution will be based on the latest model of the Wärtsilä 32 and Wärtsilä 20 generating set.

The electrical and automation system is centred around Wärtsilä's proven and popular LLC (Low Loss Concept) power-distribution system for electric and hybrid propulsion applications. The Wärtsilä LLC enhances energy efficiency and offers excellent redundancy with superb system availability. The Wärtsilä LLC will enable the vessels to achieve the highest possible Environmental Regularity Number (ERN) of 99.99.99.99. The ERN rating represents the capability of a vessel to maintain its position and normal operations under certain weather conditions. Wärtsilä is the first company capable of providing such a high ERN.

The propulsion system includes two Wärtsilä controllable pitch propellers (CPP) and five Wärtsilä transverse thrusters. The full integration of all these Wärtsilä systems ensures optimised operational efficiency while, at the same time, providing both the owner and the yard with single-supplier time and cost-saving benefits.

"With offshore oil and gas exploration moving to deeper waters and ever more challenging conditions, the emphasis is increasingly on efficient and reliable vessels with low operating costs and a minimal environmental footprint. These needs largely explain why Wärtsilä integrated solutions have been selected for these vessels," said Magnus Miemois, Vice President, Solutions, Wärtsilä Ship Power.

"The design of these vessels displays the provision of safe operations with reliability and efficiency. An example of this is that we have selected Wärtsilä's fully-integrated fuel-efficient and flexible propulsion system to give the performance we need. This integration capability will enable good fuel economy, low emissions, and excellent station keeping. This certainly adds considerable value to the equipment package," said Head of Special Projects & Newbuilding, Director Peter Kragh Jacobsen, Maersk Supply Service A/S.

The first six vessels are scheduled for delivery between the fourth quarter of 2016 and the third quarter of 2017. If the option is taken up, the additional four vessels will be delivered at the beginning of 2018.

Wärtsilä Sea Water Desalination Systems for Seven Cruise Ships

The Meyer Werft Germany, Meyer Turku, STX France, and Fincantieri shipyards have all placed orders with Wärtsilä for the supply of fresh-water generators to a total of seven cruise ships. The orders were placed between September and November 2014. Delivery of the Wärtsilä systems is scheduled to commence in May 2015 and will be completed by autumn 2017.

Wärtsilä's delivery comprises a total of 10 large MSF distillation systems with unit capacities spanning from 115 t/day to 900 t/day, and four single-stage desalination systems (SSD) with unit capacities of 30 t/day.

The Australian Naval Architect

The Wärtsilä Serck Como fresh-water generators produce the fresh water needed onboard a cruise ship for deck washing, laundry, cabins, swimming pools, and technical applications which need high-quality water. The very reliable evaporators, which employ the multi stage flash (MSF) principle, utilise the waste heat from the ship's main engine in order to evaporate seawater in multiple stages under vacuum. Every consecutive stage has a slightly lower pressure, which leads to high energy efficiency.

The MSF evaporator produces fresh water at constant high quality and reliability as the process is independent of changing seawater temperatures, and very tolerant to impurities (e.g. algae) in the seawater. The extremely low salt content remaining in the end product (less than 5 ppm) makes it suitable for even the most demanding technical applications.

"Major cruise ship owners are already using Wärtsilä Serck Como evaporators on their vessels, and are clearly satisfied with the reliability and quality of the fresh water produced by our solutions. This is evidenced by the fact that more than 130 cruise ships in global operation have our evaporators on board. We are very proud to continue to support these leading cruise companies with systems which feature numerous benefits, including improved energy efficiency, flexible design and easy maintenance," said Mr Vesa-Pekka Virkki, Managing Director, Wärtsilä Serck Como.



Wärtsilä Serck Como fresh water generator
(Image courtesy Wärtsilä)

Wärtsilä Integrated Propulsion Solution for Gas-fuelled Tugs

Three large new escort tugs contracted by Norwegian operator Østensjø Rederi, will feature Wärtsilä dual-fuel (DF) engines integrated with a customised gas storage and supply system also supplied by Wärtsilä. The tugs will operate primarily on LNG (liquefied natural gas) but the Wärtsilä DF engines provide the flexibility to select the most-suitable fuel according to availability, price and local environmental restrictions. The contract for the Wärtsilä solution was signed in December 2014. The design of the tugs has been carried out by the designer, Robert Allan Ltd in Canada, in close cooperation with Østensjø Rederi.

The overall LNG system, which incorporates Wärtsilä's unique LNGPac fuel system, a fully-integrated gas-handling system, and the Wärtsilä Gas Valve Unit (GVU), has been specially designed by Wärtsilä to accommodate the need for

a compact solution. The tugs will be powered by 6-cylinder Wärtsilä 34DF dual-fuel engines. The Wärtsilä equipment will be delivered during the first half of 2016.

“These are trend-setting tugs in that they provide environmental sustainability through the use of LNG fuel. Wärtsilä is the technology leader in making this trend possible. At the same time, the flexibility of the dual-fuel engine technology also ensures a high level of operational security since the switch from gas to diesel can be made at any time without loss of speed or power,” says Mr Carl Johan Amundsen, Project Manager at Østensjø Rederi.

The vessels are designed to have a bollard pull of 100 t, and will operate at Statoil’s Melkøya terminal near Hammerfest, Norway. Wärtsilä and Østensjø have cooperated closely to develop the chosen LNG solution for these new vessels.

Østensjø Rederi is a leading provider of offshore services and operates a fleet of 28 modern vessels. The company’s tugs currently operate at four terminals located in Norway, England and Ireland. The group has offices in Norway, the UK, Ireland and Malta.



The new escort tugs contracted by Østensjø Rederi will feature a Wärtsilä solution including dual-fuel engines integrated with a customised gas storage and supply system
(Image courtesy Robert Allan Ltd)

Middle East’s First LNG-fuelled Harbour Tug

Drydocks World (DDW) based in Dubai, UAE, has contracted Wärtsilä to design and supply the propulsion and other equipment for a new harbour tug which will operate on liquefied natural gas (LNG). This will be the first harbour tug in the Middle East region to operate on gas. The order was signed in November.

The 29 m long tug is the first of a series of nine such vessels to be built and operated by DDW. The project is part of a ‘green’ initiative launched by the Dubai government, and is intended to set an example for promoting environmental sustainability throughout the region.

“We are happy to work with Wärtsilä to promote a green image for our harbour work. Wärtsilä is a solution provider with vast experience and expertise in gas fuel systems. The company has a strong local presence and is capable of providing the support needed,” said Mr Khamis Juma Buamim, Chairman of DDW.

Wärtsilä is to provide a full scope of solutions for this eco tug, emphasising both the company’s leading position in enabling the use of LNG as a marine fuel and its unique capability to provide a full range of solutions from initial design to lifecycle support. In all, Wärtsilä will supply

the ship design, two 9-cylinder Wärtsilä 20DF dual-fuel engines, Wärtsilä Steerable Thrusters (WST), type WST-18 Compact thrusters, the automation equipment, and the Wärtsilä LNGPac system.

The Wärtsilä LNGPac is a complete fuel gas handling system for LNG-fuelled ships. It includes the bunkering station, the LNG tank and related process equipment, as well as the control and monitoring system.

With the Wärtsilä WST-18 thrusters, this tug will be equipped with one of the most advanced products in the marine industry. These units, which are part of the new Wärtsilä Steerable Thruster (WST) Compact series, provide optimal efficiency, high hydrodynamic performance and easier maintenance. By achieving outstanding efficiency at different power outputs, the WST Compact series reduces fuel consumption, thereby further lowering the vessel’s environmental footprint.

“The shift towards the use of LNG fuel is building up speed across the world. At Wärtsilä we feel proud that we have been at the forefront of this movement, first through the development of dual-fuel engine technology, and then by developing a full range of integrated solutions serving the complete gas value chain. This will be the first harbour tug in the Middle East to operate on gas, which indicates the growing importance of environmental issues everywhere,” said Mr Ibrahim Behairy, Sales Director, Middle East, Wärtsilä Ship Power.

The Wärtsilä 20DF engine

The Wärtsilä 20DF is a medium-speed dual-fuel engine which can be run on either natural gas, marine diesel oil (MDO), or heavy fuel oil (HFO). The engine can smoothly switch from gas to MDO/HFO and vice versa during operation without power interruption. The use of Wärtsilä’s dual fuel engine technology enables vessels to sail without restrictions in Sulphur Emission Control Areas (SECAs) and Nitrogen Emission Control Areas (NECAs). Natural gas is the most environmentally-sound fuel today, and it fulfils current actual and known future marine emissions legislation.



The first LNG-fuelled harbour tug in Middle East region will be designed by Wärtsilä and feature a full scope of Wärtsilä solutions
(Image courtesy Wärtsilä)

MEMBERSHIP

Australian Division Council

The Council of the Australian Division of RINA met on Thursday 4 December 2014 by teleconference based in Sydney. The Division President, Tony Armstrong, chaired the meeting. Some of the more-significant matters raised or discussed during the meeting are outlined as follows:

Division AGM and President's Visit

Council considered preparations for the visit by our President, Bruce Rosenblatt, commencing on 21 February in Perth/Fremantle and ending on 6 March in Sydney. Visits to Adelaide and Melbourne would also be included. Mr Rosenblatt would attend the Division's AGM on 4 March in Sydney.

Australian Naval Shipbuilding and Repair Capability

Council noted the submission made to the Senate Economic References Committee inquiry on naval shipbuilding. Further information from members was invited in anticipation of the Division being invited to appear before the inquiry.

In relation to this general subject, members held a wide-ranging discussion on the industry and on the procurement of future naval ships, taking into account recent statements by the Minister and senior Defence personnel.

Surveyor Accreditation under National System for Domestic Commercial Vessels

In response to a query on this matter, Council noted that members had not provided any information on which the Division could base a submission in response to AMSA's call for submissions early in 2014. No submission by the Division had therefore been made, so the Secretary had no information on which to make representations on behalf of members at a meeting on this subject held by AMSA in May 2014.

Council requested two members who are active in this area to develop a draft submission which could be made to AMSA by the Division.

Council also noted that the AMSA CEO had announced implementation of a Mark II version of the National System under which AMSA would assume responsibility for service delivery from 1 July 2017.

PACIFIC 2015 IMC

Council received a report on progress in planning for the Conference, noting that the deadline for submission of abstracts was 9 March 2015.

Next Meeting of Council

The next meeting of the Australian Division Council will be held on Wednesday 4 March at 1400 Eastern (1100 Western) Standard Time.

Amendments to Agreement of Cooperation with Engineers Australia

Prior to the Division Council meeting on 4 December, a ceremony was conducted at which amendments to the Agreement of Cooperation with Engineers Australia were signed. The amendments update the reciprocal recognition of membership arrangements between the two institutions, and formalise hospitality arrangements for members of one

institution participating in the activities of the other. The amendments were signed by our Division President, Tony Armstrong, and Bruce Howard, Chairman of the Joint Board on Naval Architecture, on behalf of EA. Fiona Kethel of EA, Secretary of the Joint Board, witnessed the signing together with the Division's Secretary.



Bruce Howard (EA) and Tony Armstrong (RINA) — both seated — with Fiona Kethel and Rob Gehling at the signing of the Amended Agreement of Cooperation (Photo courtesy EA)



John Jeremy AM

Award for John Jeremy

Finally, I'm sure that all Council members will join me in congratulating John Jeremy on his award of Member of the Order of Australia in the Australia Day Honours list. John has been active in the Institution throughout his career and was President of the Division for the period 1978–85, long before he assumed the editorship of this journal which itself seems a long time ago. My only disappointment with

this honour is that his shorthand citation “for significant service to the preservation and celebration of naval and maritime history” makes no mention of John’s substantial contribution to the naval architecture profession, RINA, and the Australian shipbuilding industry. The full citation (available at <https://gg.gov.au/australia-day-2015-honours-list>) is, however, much more complete.

Also, in December, The Company of Master Mariners of Australia presented John with the Company’s Outstanding Achievement Award for 2013. The award was presented by Captain Ted van Bronswijk, Federal Master of the Company.

Congratulations John!

Rob Gehling
Secretary

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 Pacific International Maritime Conferences in Sydney.

The procedure for obtaining a free student place is to email your request to the Chief Executive, Trevor Blakeley, at tblakeley@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 Division	rina.austdiv@optusnet.com.au
Section ACT	rinaact@gmail.com
NSW	rinansw@gmail.com
Qld	m-dever@hotmail.com
SA/NT	danielle.hodge@defence.gov.au
Tas	mfsymes@amc.edu.au
Vic	andrew.mickan@dsto.defence.gov.au
WA	rina.westaus@gmail.com

Phil Helmore



HMAS Anzac arriving in Sydney for the first time after the completion of her Anti-ship Missile Defence (ASMD) upgrade in Western Australia
(RAN photograph)

VALE BOB CAMPBELL

It is with much regret that we advise that Bob Campbell, a past President of the Australian Division of the Royal Institution of Naval Architects and a past Chairman of the organising committee of the Pacific series of International Maritime Conferences, passed away on Wednesday 4 February 2015.

A tribute to Bob, who will be much missed by his many friends and colleagues, will be published in the May 2015 edition of *The Australian Naval Architect*.

Outback Boat Builders

For some years now, the Australian Division of RINA has provided a prize for achievement in the boat building course at St Philip's College in Alice Springs. St Philips is the only school in Australia teaching boat building and last year four students built a 2.12 m Water Rat and a 4.54 m Nugget, both designed by Ross Lillistone.

The Water Rat was launched at the end of November at Two Mile Waterhole on the Finke River in the Western MacDonnell Ranges. The Nugget was not quite complete and was launched in the College's pool before Christmas.

The College is exploring the idea of holding a regatta at the waterhole in 2016, by which time they plan to have built some more Water Rats. A Regatta on the Finke River in Central Australia should be a special event!

The RINA prize for 2014 was awarded to Catherine Driver, a Year 12 student. Catherine achieved an A grade in the course and is applying to join the Royal Australian Navy.



Catherine Driver was presented with her award by Frank Bilato, a local businessman
(Photo courtesy St Philip's College)



Proud boat builders with their teacher Geoff Leedham (third from the left) and the headmaster of St Philip's College Chris Tudor (third from the right)
(Photo courtesy St Philip's College)

NAVAL ARCHITECTS ON THE MOVE

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

Tom Boddy, a graduand of UNSW Australia, continues in his position as a naval architect with the Contract Services Branch of the Department of Defence in Sydney.

Roger Duffield has moved on within the Department of Defence and has taken up the position of Platform Systems Co-ordinating Design Acceptance Representative, in Adelaide.

Tommy Ericson has moved on from Aluminium Boats Australia and is now consulting as Aus Yachts in Brisbane.

Jon Gould has moved on from Woodside Energy and has taken up the position of Senior Technical Consultant with Peritus International in Perth.

Geordie Grant has moved on from the Fleet Engineering Division and has taken up the position of Platform Manager with the Defence Materiel Organisation in Sydney.

James Heydon, a graduand of UNSW Australia, has taken up a position as a naval architect with the Total Ship Survivability Section of the Directorate of Navy Platform Systems in the Department of Defence in Canberra.

Caitlin Hoey, a graduand of the Australian Maritime College, has taken up a position as a naval architect with the Directorate of Navy Platform Systems in the Department of Defence in Canberra.

Hugh Hyland continues as Assistant Director Engineering with the Department of Defence at Garden Island in WA, and has just clocked up 50 years of service with the Department of Navy/Department of Defence. Hugh was in the fifth graduating class of naval architects in 1963 from the then newly-established University of New South Wales, now UNSW Australia. Congratulations, Hugh!

Nick Kitching has moved on from Azimut Yachts, and has taken up the position of Naval Architect with Navantia

Australia in Adelaide.

Joanna Mycroft has moved on within the Lloyd's Register organisation and, following some months travelling from Southampton back to Australia via Canada, has taken up the position of Senior Specialist in the Sydney office.

Bernard O'Shea moved on from Strategic Marine in 2007 and, after seven years with Arup, has taken up the position of Senior Technical Advisor on the Sydney Inner-harbour Ferry Procurement Project, seconded to Transport for NSW, in Sydney.

Jason Steward has moved on from BMT Design and Technology and has taken up the position of Business Development Manager with BMT Nigel Gee in Southampton, UK.

Dauson Swied, a graduand of UNSW Australia, has taken up a position as a naval architect with One2three naval architects in Sydney.

Cengizhan Uluduz has moved on within the Diab Group, and has shifted from Dubai to Busan, Korea, to set up their new office there.

Lucy Xu, a graduand of UNSW Australia, has taken up a position as a trainee naval architect with Singtong Marine & Offshore in Nantong, China.

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

Phil Helmore



HMAS *Parramatta* sailing from Fleet Base East on a bleak Sydney day in January to commence her journey to Fleet Base West where she will be the next Royal Australian Navy ship to undergo the Anti-ship Missile Defence (ASMD) upgrade
(RAN photograph)

FROM THE ARCHIVES

A Flagship for the New Royal Australian Navy — HMAS *Australia* (I)

John Jeremy

Whilst the cruiser HMAS *Sydney* earned lasting fame on 9 November 1914 from her battle with the German cruiser SMS *Emden*, another ship of the first RAN Fleet Unit also had a special place in the minds of Australians in the first decades of the 20th Century. That ship was the battlecruiser HMAS *Australia*, which led the fleet into Sydney Harbour for the first time on 4 October 1913.

In the early years after Federation, the discussion of plans for the development of an Australian Navy centred on a squadron of ships including cruisers, torpedo-boat destroyers and torpedo boats. However, at the Imperial Defence Conference of July 1909, a much more ambitious plan was developed, which included an armoured cruiser. This Fleet Unit was expected to 'be capable of action not only in the defence of coasts, but also of the trade routes, and would be sufficiently powerful to deal with small hostile squadrons should such ever attempt to act in its waters.' [1]

In time of war the Australian Fleet Unit was intended to form part of the Eastern Fleet of the Royal Navy. The final proposals arising from this conference included an armoured cruiser of the Indefatigable class and were broadly accepted by the Commonwealth Government. New Zealand also agreed to fund the construction of an armoured cruiser, which became HMS *New Zealand*, provided to the Royal Navy as an outright gift. After 1912 this type of ship became known as a battlecruiser — a ship similar to the Dreadnought-type battleship but with simpler subdivision, reduced armour and higher speed.

Three ships of this class were built — HMS *Indefatigable*

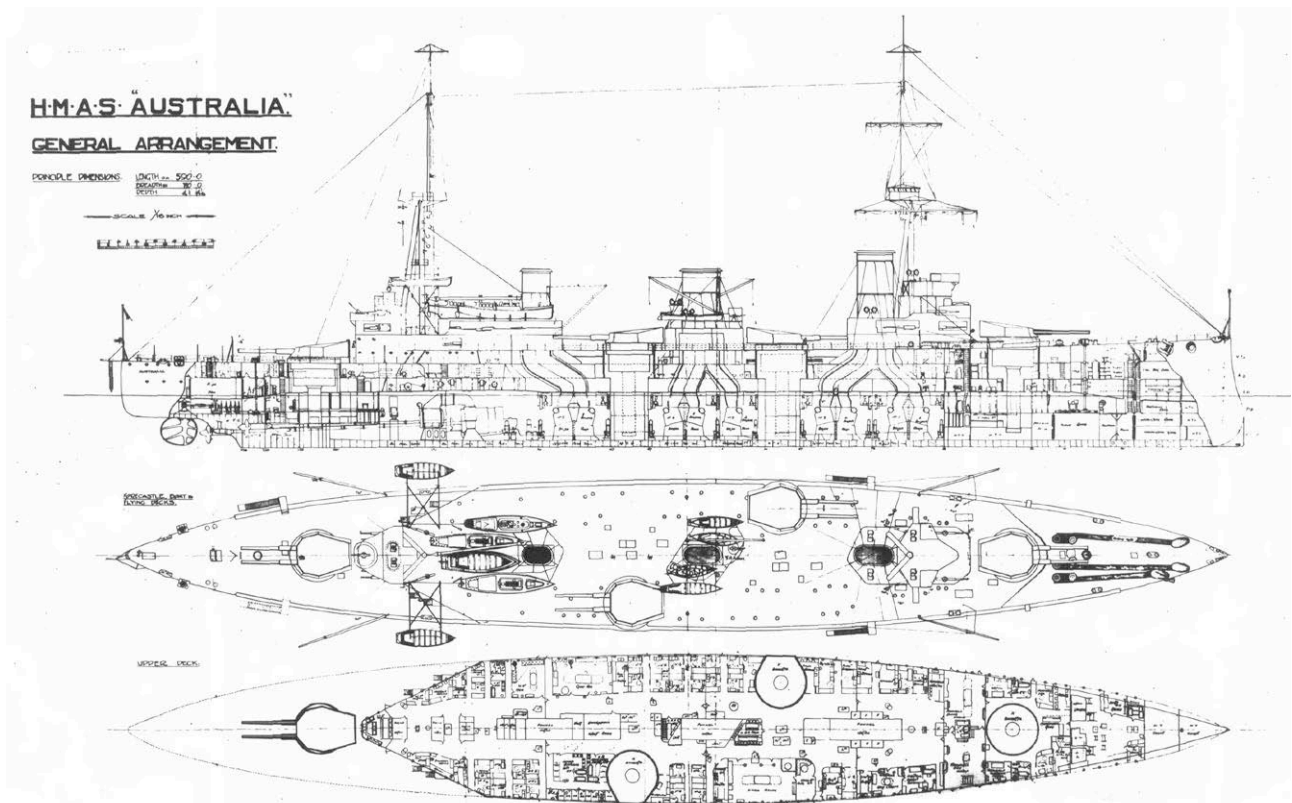
(completed in April 1911), HMS *New Zealand* (completed in November 1912) and HMAS *Australia* (completed in June 1913). The ships had a full load displacement of 22 481 t and were 590 feet (178.8 m) long overall with a moulded beam of 79 feet 10.5 inches (24.2 m) and a draught of 30 feet (9.1 m). They were armed with eight 12 inch (305 mm) 45 cal. Mk X guns, sixteen 4 inch (102 mm) 50 cal. Mk VII guns, four 3-pounders, five machine guns and two submerged 18 inch (457 mm) torpedo tubes, one on each beam. [2]

Power was provided to four shafts by Parsons direct-drive steam turbines with steam provided by thirty one Babcock & Wilcox boilers which could burn coal or oil. The designed shaft power was 43 000 HP (32 065 kW) for a speed of 25.8 kn, although *Australia* achieved 27.48 kn during trials on 11 March 1913 at 56 050 SHP (41 796 kW). The range was 6690 n miles at 10 kn, reducing to 3360 n miles at 23.5 kn.

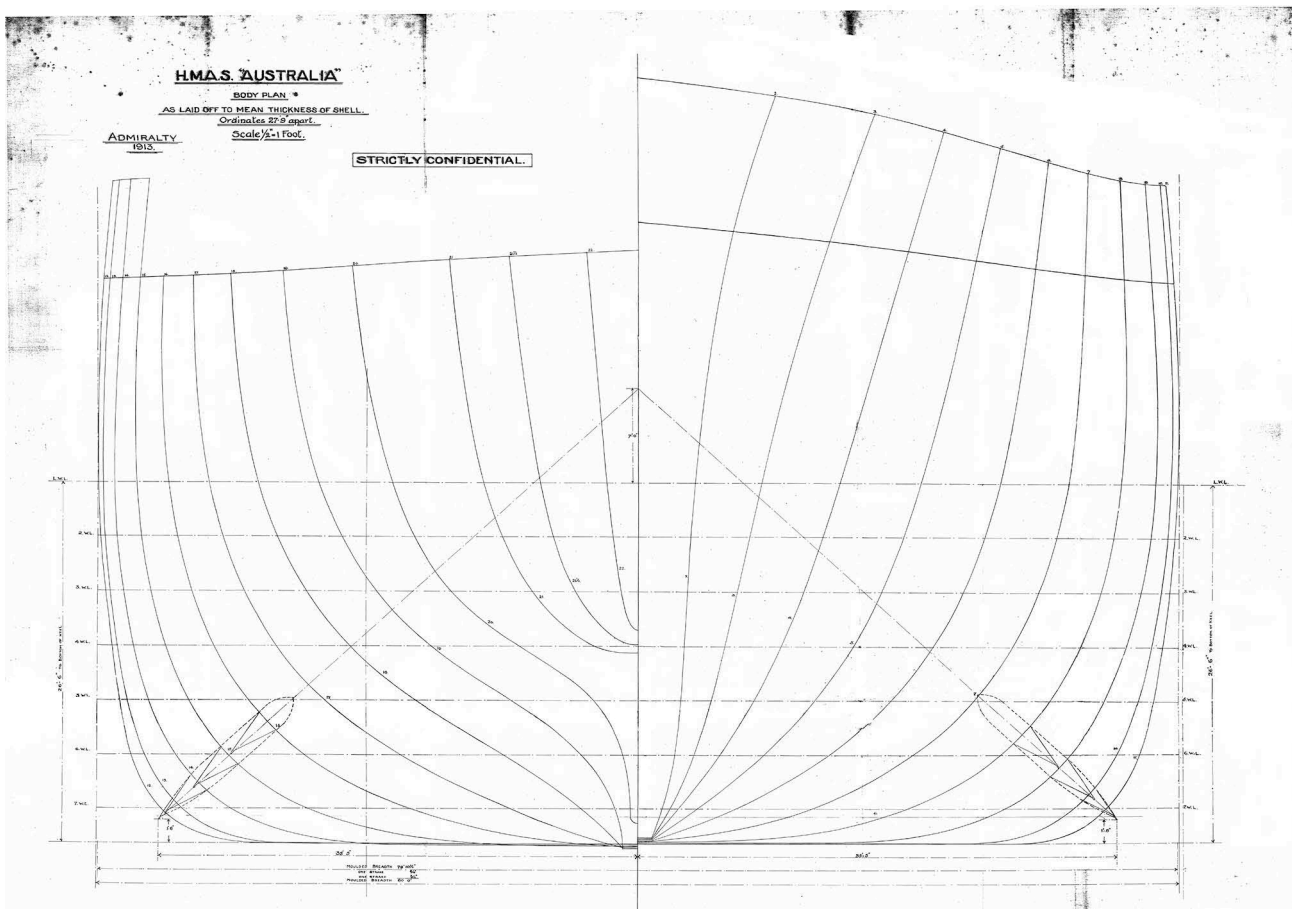
The main armour protection comprised a belt of 6 inch (152 mm) side armour reducing to 4 inches (102 mm) abreast A and Y barbettes (increased to 5 inches (127 mm) in *Australia* and *New Zealand*). The overall scheme of protection was regarded as weak even at the time the ships were built.



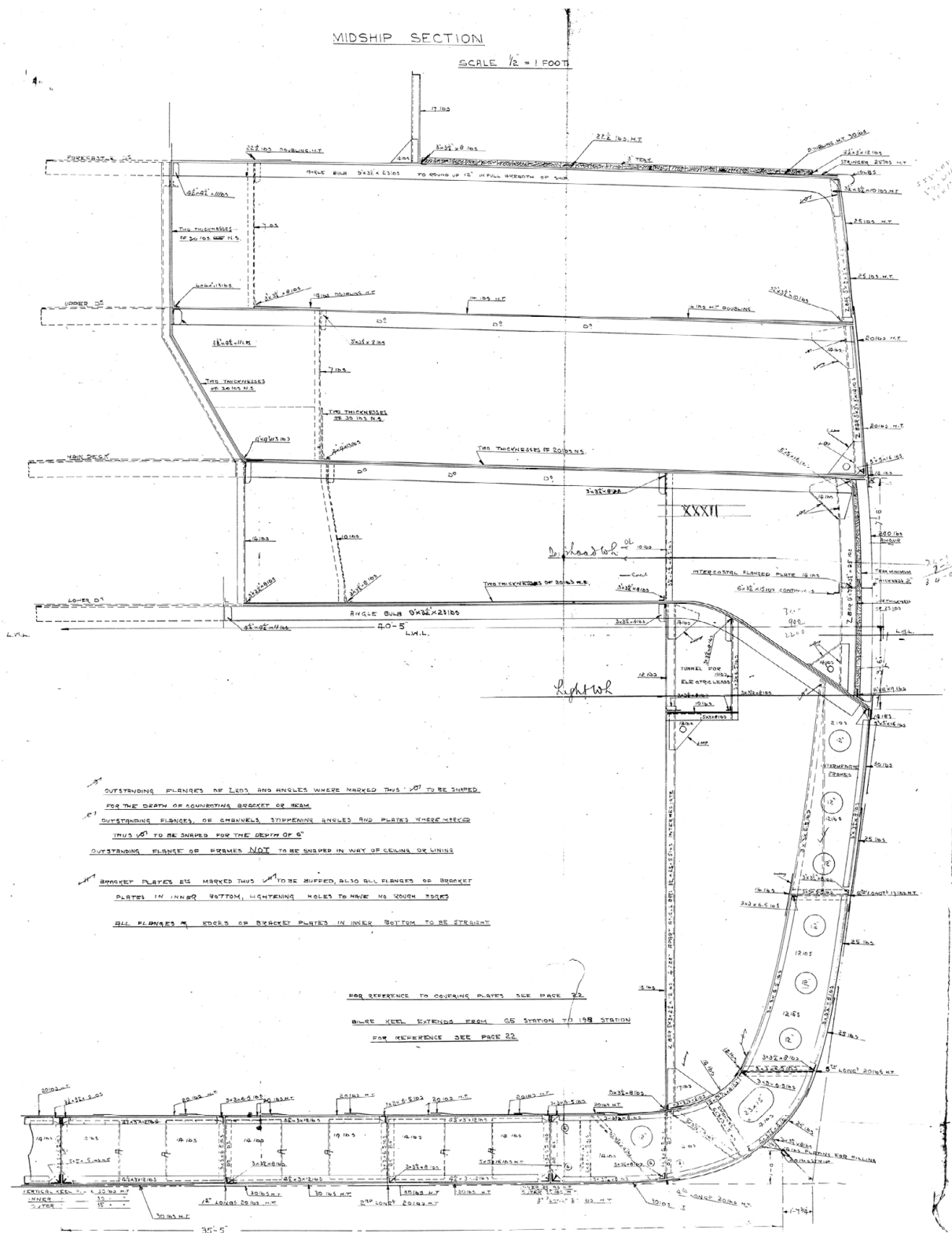
HMAS *Australia* soon after arriving in Australia in 1913
(State Library of Victoria)



The General Arrangement of HMAS Australia
 (RAN Historical Collection)



The body plan of HMAS Australia
 (NAA: C3308, 26)



The midship section of HMAS *Australia*
(NAA: C3308, 18)

As built the complement in *Australia* was 818 officers and men.

Tenders for the 'First Class Armoured Colonial Cruisers' were invited by the Admiralty from seven private British shipbuilders on 23 December 1909. The lead ship of the class, *Indefatigable*, had been ordered from Devonport Dockyard. The tenders of John Brown & Co. and Fairfield were successful, with the former to build *Australia*. The contract was awarded on 1 April 1910 and *Australia* was laid

down on 23 June 1910. The main armament was supplied by Vickers at Barrow in Furness. [3]

The construction of *Australia* was delayed by a long national boilermaker dispute and a shortage of labour. She was launched 25 October 1911, and left the Clydebank for trials 17 February 1913, well after the contract completion date of September 1912. She sailed for final trials on 18 June 1913 and was commissioned as HMAS *Australia* at Portsmouth on 21 June 1913.

The flag of Rear Admiral George Patey RN was hoisted on board HMAS *Australia* on 23 June. Patey was knighted on the quarterdeck by King George V on 30 June 1913 and she sailed the following month for Australia in company with HMAS *Sydney* [4].

The presence of HMAS *Australia* in the Pacific undoubtedly helped to keep the German Pacific Squadron away from Australian waters after the outbreak of World War I in August 1914. The ship participated in operations in the Pacific in the latter part of 1914 before sailing for Europe. She arrived in Plymouth (having sunk a German steamer on the way) on 28 January 1915. In February she became the flagship of the Second Battlecruiser Squadron of the Grand Fleet, joining her sister ships *Indefatigable* and *New Zealand*. In April 1916 *Australia* collided with HMS *New Zealand* and was in repair at Devonport until 9 June 1916. Consequently she missed the Battle of Jutland. HMS *New Zealand*, which had replaced her as flagship of the Squadron, was heavily engaged during the battle but sustained only minor damage. HMS *Indefatigable* was not so fortunate. Engaged by the German battleship *Von der Tann*, the last ship in the German line, she exploded and sank with heavy loss of life — there were only two survivors.

Following further repairs after a collision in December 1917, this time with HMS *Repulse*, *Australia* took part in trials with aircraft. On 14 May 1918, a Sopwith two-seater aircraft successfully took off from a platform erected on her starboard 12-inch (305 mm) gun turret.

HMAS *Australia* was at the surrender of the German High Seas Fleet on 12 November 1918, and she sailed from Portsmouth for Australia on 23 April 1919.

By the end of the War, with the rapid development of warship design during the war years, there can be little doubt that HMAS *Australia* was obsolete. Her remaining service was spent in training duties until she was paid off on 12 December 1921, never having fired her main armament in action. Under the terms of the Washington Treaty of 1922 *Australia* was to be disposed of — she was counted as part

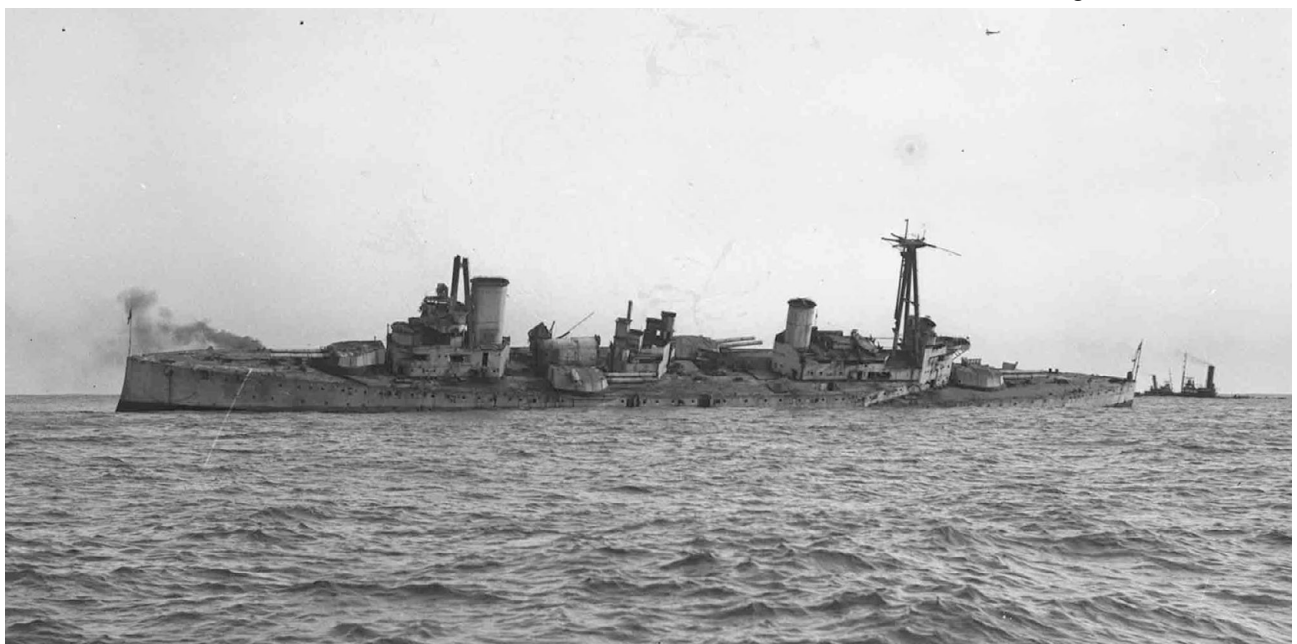
of the British Fleet — and she was stripped of valuable or useful equipment at Garden Island before being scuttled east of Sydney on 12 April 1924, a little under 11 years old.

The disposal of HMAS *Australia*, regarded by many as a symbol of Australia's nationhood, was controversial and unpopular. The words of E.T. St John of Adelaide, writing in *The Advertiser*, were typical of the public response: 'One wonders what kind of fools we had looking after our interests at the Washington Conference' [5]. Like HMAS *Sydney*, there are many relics of the RAN's first flagship in museums and private collections around Australia — she is long gone but not forgotten.

Today the wreck of HMAS *Australia* lies in 390 m of water near the edge of the continental shelf at 33°51' 54.21" S, 151° 44' 25.11" E. The ship was located in 1990 and was inspected by a remotely-operated vehicle in 2007. In quite good condition, she lies upside down supported by her remaining superstructure which must, over time, collapse. The wreck is highly significant in view of its relevance to Australian naval history and it is the most intact wreck of a World War I British battlecruiser. Hopefully a detailed survey of the ship and her debris field will prove to be possible in future years [6].

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HMAS *Australia* sinking east of Sydney Heads on 12 April 1924
(Australian National Maritime Museum, Samuel J Hood Collection)



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