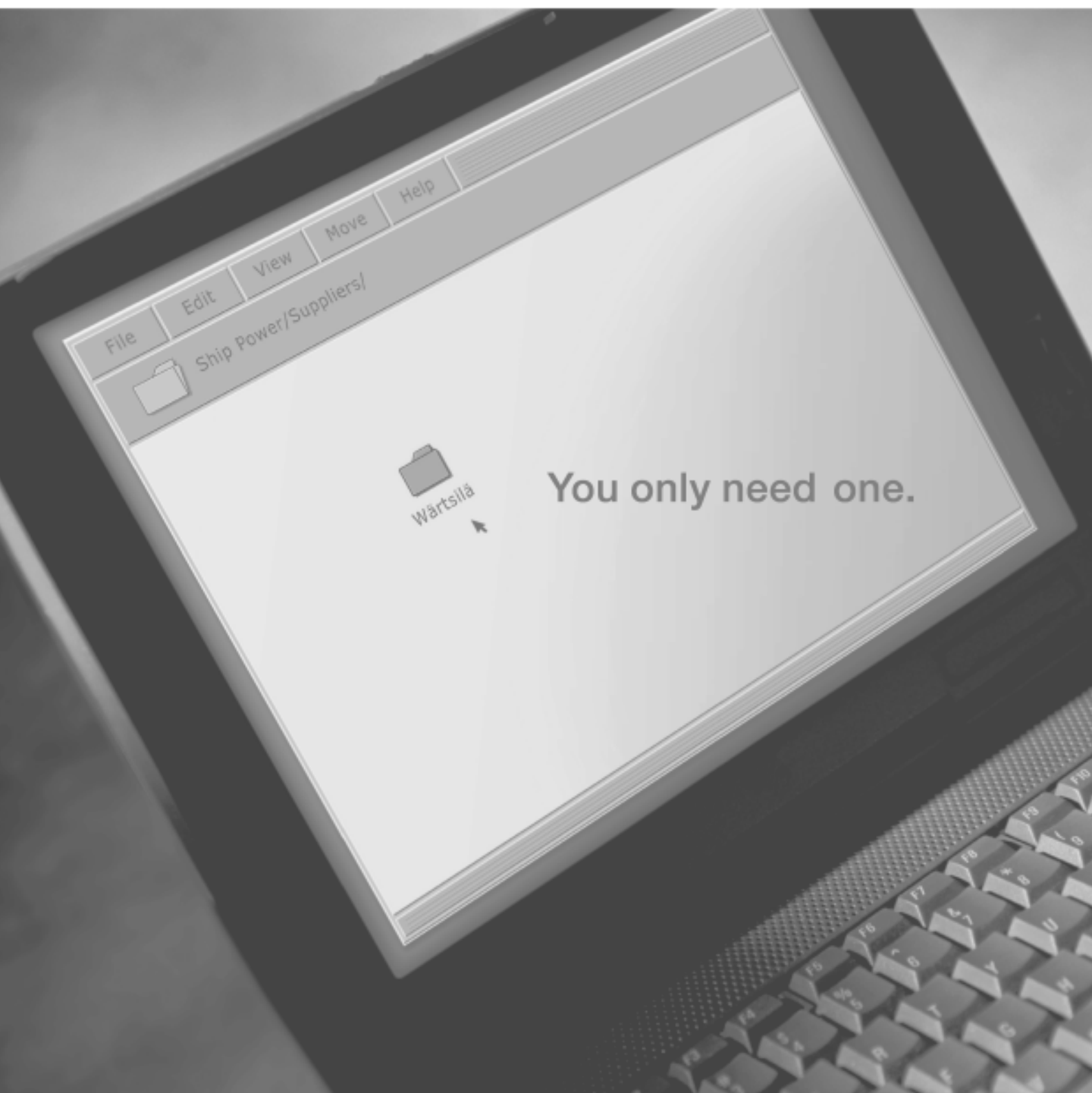


THE AUSTRALIAN NAVAL ARCHITECT



Volume 6 Number 3
August 2002



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THE AUSTRALIAN NAVAL ARCHITECT

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The Royal Institution of Naval Architects
(Australian Division)

Volume 6 Number 3
August 2002

Cover Photo:

The fourth Anzac Class frigate to enter service — HMAS *Stuart* during sea trials. *Stuart*, which was launched by Mrs Maxine Barrie on 17 April 1999, was handed over to the RAN on 31 May 2002 (Photograph courtesy Tenix)

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RINA Australian Division

on the
World Wide Web
www.rina.org.uk

From the Division President

My discussion of the Division's finances a few months ago (Where Does the Money Go?, *The Australian Naval Architect*, February 2002) triggered off a fairly strong response from one member who felt that it demonstrated just how cock-eyed the Division's financial affairs really were. This was followed by what is often called 'a frank exchange of views,' culminating in a letter from the member suggesting that the Division had an image problem and proposing some ways to address this.

I took this as fair criticism. One proposal by the member was that each of the various Division groups and sub-committees (Safety, Membership, et al.) should provide a report on its activities in each issue of *The Australian Naval Architect*. This is being implemented and the first of such reports will appear in the next issue. The member also proposed several other actions and these will be implemented at the earliest opportunity.

I'm grateful to the member concerned for his comments. Like most people I don't like receiving criticism but I've been around long enough to know that constructive criticism, which tells me not only where I've gone wrong but what might be done to improve, is one of the best ways to improve my performance.

A topic of some concern at the moment is that of Professional Indemnity (PI) insurance, about which I have heard a number of horror stories. These include individuals with faultless records who have been unable to obtain cover, others who have had untenable conditions imposed on them and others who have had their premiums increased to seemingly ridiculous levels (increases of the order of 300% have been reported).

For those of us who are employees, which is almost certainly the majority of those in the workforce, PI may not be an issue because of the principles of vicarious liability which normally apply — the risk is accepted by the employer, who indemnifies the employee. However for those who operate in a sole trader or partnership environment, or are directors of small companies, it is a very serious issue.

The Institution is working at both the Division and parent body level with brokers and with companion bodies including IMarEST and IEAust. to address this issue which is by no means limited to naval architects. It is dealt with in more detail elsewhere in this edition and I hope to be able to arrange a more general contribution to the whole subject in a subsequent edition.

On a final note, during the most recent meeting of the (London) Council the new President, Professor William Price, announced his intention of reviewing RINA's future strategy and asked Council members for their thoughts. In line with that, I would very much like to hear from members of the Division what they think about the future of RINA. Where do you think it should be going? What do you think it should be doing that it currently is not, and what do you think it is doing which it should cease doing? The Councils can't cover all the ground themselves and need feedback from the members. Please direct your written comments, by e-mail, mail or fax to me at the Division's address. I look forward to hearing from you.

Bryan Chapman

The Australian Naval Architect

Editorial

One of the features of life that makes it interesting is the unexpected. Until the evening of 7 July, a suggestion that a major British warship would be seriously damaged, and almost sunk, off the coast of Australia would have been dismissed as fanciful. The collision between HMS *Nottingham* and Wolf Rock off Lord Howe Island is a reminder that the inconceivable sometimes happens.

Two interesting accounts will emerge from the *Nottingham* incident. One is how the ship could possibly have hit the rock with so much available sea room. The second, and of more interest to naval architects, is the story of the damage control that saved the ship, the recovery of the ship from Lord Howe Island, and (hopefully) the eventual repair of the ship. From information made public so far, I cannot have anything but the greatest admiration for the professionalism, training and discipline of *Nottingham's* ship's company and the work they did to save that ship in the hours following the incident. The ship could so easily have been lost.

HMS *Nottingham* will be returned to Britain, but this event has highlighted the importance of the Australian Government's current strategic review of the naval shipbuilding and ship repair industry. The RAN is busier today than it has been for many decades. Had the unfortunate ship been ours, we would now be faced with the challenge of returning her to service in the least possible time. It is to respond to that type of challenge that we need an industry with the knowledge of naval ships and ship repair, and resources that can be concentrated and, if necessary, expanded quickly.

The Australian Strategic Policy Institute has published a report that discusses the future strategies for the Australian naval shipbuilding and repair industry. It is a thoughtful and interesting report, the executive summary of which is reproduced in this edition of *The ANA*. The subject is immensely complex, as I found when I chaired the Defence Industry Committee sub-committee that produced a similar report in 1995. The ASPI report is a most useful contribution to the debate, and its recommendations have much to commend them.

In the report, the authors state:

'There is in fact no strong strategic reason to build the Navy's warships here in Australia. It makes sense to do so if the premium is not too high, because there are economic benefits and some advantages in developing the skills for repair and maintenance. But the real strategic priority is to have the ability to repair and maintain our ships, including the ability to keep them in operation during a conflict.'

I entirely endorse the last sentence, but must disagree with the remainder of the paragraph. I believe that there is a compelling strategic reason to build a significant proportion of our naval ships in Australia. It is that high-profile activity that can provide a relatively long-term and stable workload to develop the infrastructure and resources we need to achieve the primary strategic aim. We must be able to attract the best young Australians to work in an industry that employs the best engineering and technology to learn how ships work and develop the skills needed to manage the unexpected. That industry needs to have the size and mass to survive in a

competitive world marketplace. Mere maintenance and refit, important though it is, is not enough.

Perhaps the most difficult question facing the Government is that of industry rationalisation, including the future of the Australian Submarine Corporation. Should the Government intervene in this process or leave it to market forces? Governments have shown in the past that intervention by them into the commercial world is not always accompanied by success, and I lean towards the ASPI recommendation that market forces should be left to decide the outcome.

The ASPI report expresses a concern held by many, namely the risks associated with the development of an industry monopoly. Regardless of the approach that is finally adopted by the Government, that outcome remains a possibility.

It is interesting to observe the changes that have occurred in recent years to the naval shipbuilding and repair industries in Britain, Europe and the United States. In the latter, for example, despite the largest market in the world, extensive rationalisation has taken place. The US Navy has sought to retain competition and more than single sources for its major ships. But recently it has endorsed an agreement between General Dynamics and Northrop Grumman Ship Systems to concentrate all construction of LPD 17 amphibious

transport dock ships with Northrop Grumman and all DDG51 destroyers with General Dynamics (Bath Iron Works). This sole-source arrangement for each class is expected to produce significant cost savings for the Navy and increased productivity for both companies.

Time will tell, of course, but changes in the form of the Australian industry appear inevitable in coming years. What we must achieve is at least one major, profitable and competitive organisation with sufficient size to maintain and develop the skills we need to satisfy our strategic needs. If it turns out that there is to be only one such organisation, the Government must develop the means to work with that organisation in a way that maximises the benefits and minimises the risks to the Australian taxpayer. Artificially maintaining competition in the interests of a perception of public probity could be counterproductive in the long run, for ultimately commercial realities will decide whether we retain the industry. In this regard, the continuing health and success of the commercial maritime industry is equally important, for it contributes to the mass that attracts and trains people and develops world class technology.

John Jeremy

Some might suggest that there is something at each end of this Lord Howe Island rainbow for salvage experts and ship repairers. Otherwise it is a rather good photograph of HMNZS *Te Mana* at anchor off the island during recovery operations for HMS *Nottingham* (RNZN Photograph)



Letter to the Editor

Dear Sir,

I write to express my dissatisfaction with the performance of the National Marine Safety Committee in its duty of consultation with industry in the drafting of the new National Standard for Commercial Vessels. The NMSC has been beavering away at Rozelle Bay, and every so often we see signs of activity. But real industry consultation is not there.

Consider the following:

- Posting documents for comment on a website, or mailing them out to callers who *otherwise* find out that they are available can hardly be construed as consulting with industry. This immediately disenfranchises those who have no web access and no way of finding out that sections are available for comment. This includes, for example, retired people who have much valuable experience, and who are likely to have the time to comment wisely.
- Conferences to which specific people are invited, or for which registration fees are charged, cannot be

construed as consulting with all of industry. They consult with small, selected sections of it.

- In speaking with the editors of *The ANA*, I find that despite regular reminder emails, getting publishable information on progress of the NSCV is like pulling teeth. Most of the information which is published is trawled from their website.
- I have been advised that the naval architects in more than one state survey authority are not being consulted or kept informed of what is happening to sections of the NSCV in which they have vital interests.
- And, last but not least, I find that few naval architects have been invited to what the NMSC is billing as "The Launch of the New National Standard for Commercial Vessels" at the cocktail party for the Marine Safety Conference 2002 in Brisbane. As a long-time industry

practitioner, with an ongoing interest in the survey of vessels in Australia, I would have thought that I rated an invite. So too, I thought, would many of my practising naval architecture colleagues. However, I know of only one naval architect who has been invited to this launch of something which is going to govern our lives for the next twenty years. Not even delegates to the conference have been advised that there is going to be a launch.

I realise that naval architects are not the only ones with interests in the NSCV. However, as a naval architect, I am vitally interested in the naval architectural aspects. I do not consider that the NMSC is engaging in meaningful dialogue with naval architects. I would be interested to hear of other views.

Noel Riley

NEWS FROM THE SECTIONS

ACT

On 28 May Mr Leo Lazauskas, a researcher with the University of Adelaide, gave a presentation on the outcomes of work that was undertaken for Navy Systems Branch to examine the optimum hull form particulars required to minimise the resistance of destroyer-sized ships. Mr Lazauskas has conducted similar research on minimisation of wave making and total resistance as well as wave wake over a number of years for vessels ranging from rowing shells to large ships (e.g. Lazauskas, L. and Tuck, E. O., Small Low-drag Solar-powered Monohulls and Multihulls, *The ANA*, v.1 n.2, June 1997). For the current study only minimal constraints were placed on the allowable hull particulars, including a minimum level of upright stability and, in some cases, overall length. Both optimum monohull and multihull options were explored, covering displacements from 4 000 to 12 000 t and design speeds between 15 and 35 kn. Leo described the use of a genetic algorithm to seek optimum hullform solutions and provided some explanations for the solutions found through this process.

The ACT Section Annual General Meeting was held on 27 June. The Chair, Bert Thomson, reviewed activities for the past year and, on reflection, it was agreed that a good selection of meetings had been arranged for our relatively small section. Bruce McNeice stood down from the position of Secretary, having coordinated the section activities for the past two years. There were no nominations to fill this position. As there were also no new nominations for the other committee positions, the committee remains much the same as in previous years:

Chair:	Bert Thomson
Deputy Chair:	Dave Magill
Treasurer:	Nick Whyatt
Secretary:	vacant
Assisting Secretary:	Martin Grimm
Members:	Rob Gehling
	Kerry Johnson
	Ian Laverock
	Tim Lyon
	Bruce McNeice
	Warren Smith

Martin Grimm

The Australian Naval Architect

New South Wales

Committee Meetings

The NSW Section Committee met on 29 May and, other than routine matters, discussed:

- The Walter Atkinson Award for 2001: Candidates were discussed and the decision made Lawry Doctors, Dougal Loadman and Simon Robards for the paper: Doctors, L.J., Helmore, P.J., Loadman, D.R. and Robards, "Directional Effects on Sinkage, Trim and Resistance", *The ANA*, February 2001. Helmore, who contributed to the paper, was ineligible (being a member of the AD Council), and was absent from the discussion and nomination.
- Ship Visit 2002: Cable-laying vessel *Pacific Guardian* in Port Botany may be a good vessel to visit; agents to be contacted with a view to a July visit.
- Bank Account: Application form for the Laboratories Credit Union completed, and signatures and referees reports required.
- SMIX Bash: Final shortfall for 2001 is \$410, of which the RINA share is \$205, compared to \$192 in the bank. Seed funding loan for 2002 is expected from Division. Proposed letter to sponsors for 2002 tabled and approved in principle.
- In joint conference with the IMarEST Committee, the following were discussed: *James Craig* has been booked for 5 December 2002 and \$2200 deposit paid; RINA share of payment for meetings in first half of 2002 already paid by IMarEST; graded (i.e. gold/silver/bronze) sponsorships for SMIX Bash 2002; increase of cost per head to \$25 or \$30 per head, but no more; and the cost split between food and beverages.

The NSW Section Committee also met on 26 June and, other than routine matters, discussed:

- SMIX Bash 2002: Wartsila have agreed to be our principal sponsor, and letters have been sent to last year's sponsors requesting support for this year.
- Ship Visit 2002: Date of 17 July agreed for visit to Sydney Ferries. Also possible visits to *Pacific Guardian* in October and the Japanese ice-breaker

Shirase on her next visit to Sydney in March 2003.

- Bank Account: Referees reports and signatures mostly provided; waiting on one set.
- Report from Australian Division: Discussions from the AD Council meeting held on 19 June were reported (for details, see *Membership* column in this issue).
- RINA comments to NMSC re the Category F2 Fast Craft Section of the new NSCV: Andrew Tuite appointed as RINA representative to provide comment.

The NSW Section Committee also met on 1 August and, other than routine matters, discussed:

- SMIX Bash 2002: First sponsorships have been received, details being refined with SHF, proposed budget tabled, ticketing to be through one person, and extending advertising coverage discussed.
- Ship Visit 2002: Visit to Sydney Ferries for Wednesday 24 July was postponed due to lack of interest. *Pacific Guardian* is now based in Suva, Fiji, and a visit will not be possible until she returns to Sydney. Visit *Sydney 2000* possible, but mutually-convenient time not easy.
- Bank Account: Signatures completed and sent to Laboratories Credit Union. However, further information and signatures required; these completed, ready for sending.
- October Technical Meeting: Topic for presentation by Lina Diaz changed from *Lines Lifting Using Photogrammetry* to *Submissions for Survey and Class: Do Yours make the Grade?*

Technical Meetings

Brett Crowther of Crowther Multihulls gave a presentation on *Design and Construction of Modern Multihulls* to a joint meeting with the IMarEST attended by forty-eight on 29 May. *Design and Construction of Modern Vessels* may have been a more apposite title, as two of the vessels he talked about were monohulls, although their core business is in vessels with more than one hull.

The first vessel was a 17 m monohull crew vessel which Crowther Multihulls designed for Lake Maracaibo in Venezuela. This lake turns out to be one of the largest oil fields in the world, and the lake is literally covered with hundreds of oil rigs, which all have to be serviced with stores and crews. Existing vessels all have problems with trim by the stern, and the design of the new vessel presented particular challenges, as there is little room or flexibility to move the heavy items to counteract the trim, and the intact and damaged stability requirements turned out to be difficult to meet within the design constraints.

Next up was a 25 m catamaran designed for tourist operation at Port Arthur, Tasmania. This vessel was built by Richardson Devine Marine in Hobart. She has a light displacement of 48 t, loaded 60 t, and is fitted with twin Caterpillar 3406s developing 347 kW each, driving five-bladed propellers. The operation involves a taxing dual role, idling tourists around Port Arthur at about 8 kn, and then a high-speed ferry run to Hobart three or four times per week. They used seakeeping data for another vessel as a basis, and were given a maximum

significant wave height for operations (determined by a wave-rider buoy), and the good news is that they don't often have to cancel.

Then they designed a 25 m catamaran, *Lady Jane Franklin*, for operation out of Strahan, Tasmania. She has a light displacement of 50 t, loaded 70 t, carries 167 passengers and is fitted with twin Caterpillar 3412s developing a total of 820 kW, giving a speed on trials of 31 kn. This vessel is approximately the same size as one which they designed for the operator's competition in Strahan. However, they spent a lot of effort differentiating the vessel from the competition, and both operators are happy! The NPWS have a wave wash limit of 75 mm at 90 m from the track, and so they needed slim hulls, but the operation across Macquarie Harbour dictated that the seakeeping characteristics also had to be adequate. In their solution, the hulls are just wide enough for the engines, with room to get around and service them provided by paying attention to the structure, cutting down on the ring frames and beefing up the longitudinals to suit. In addition, there was a draft restriction at one of the calls, so she can pump 6 t of ballast out of or into bow tanks in 30 s to change the operating draft quickly. There is a lot of glass in the sides and top of the superstructure, and the owner leaves the inside lights on at night, and seems to be rewarded with longer queues for bookings the next morning!

Finally, Brett presented a 28 m monohull luxury motor yacht which they designed for a client in Brazil. The vessel has a beam of 7.5 m, a light displacement of 65 t, loaded 70 t, and was built in Rio of advanced composites on a foam core. She is propelled by KaMeWa waterjets for a sprint speed of 40 kn and cruising speed of 20 kn. The owner is something of an adventurer, and expects to use the vessel to go to remote places to chase world records in spearfishing.

Question time was lively regarding the designs of the vessels, and people were also interested in how a small company had secured overseas contracts. It turned out that both those presented had come from builder dissatisfaction with previous naval architects, one contact via Austrade, and the other by being in the right place at the right time.

The vote of thanks was proposed by Bob Dummett, who said that the vessels presented were *all* interesting to him, since his design experience had been mostly in vessels of many times the displacements, of other material (steel), and none of which was capable of more than twelve knots. However, unlike most people there, he *had* heard of Lake Maracaibo; one of his first jobs as a junior draftsman in England had been on a crew boat for Lake Maracaibo. Brett replied that he wished he had known of Bob's knowledge a year ago when they started the job!

Glen Ellis of Australian Defence Industries gave a presentation on *Support Management for the Minehunter Project* to a joint meeting with the IMarEST attended by twenty-two on 26 June. Glen set the scene by outlining the background to the project to acquire six Huon-class minehunters which are reputed to be the most advanced of their type in the world. The MSB site at Newcastle was leased, and \$26 million spent on the facility, including the construction hall to accommodate two vessels at one time (laying up and fitting out) and the marine railway (horizontal platform) launching system. The first vessel was laid up in

Italy, transported to Australia as deck cargo, floated across Newcastle Harbour, and fitted out at the new facility in Newcastle.

The fixed-price contract was signed in August 1994 for a price of \$1 billion for the supply and in-service support of the vessels. Completion is due in October 2003. The facility was built in the twelve months following signing of the contract.

The vessels have a length of 52.5 m, beam 9.9 m, draft 3.0 m, displacement 720 t, complement 36 and accommodation for 49. They are powered by a Fincantieri diesel developing 1460 kW and driving a single controllable-pitch propeller, and three 120 kW Riva-Calzoni auxiliary propulsion units. The vessels have self-defence systems as well as mine-disposal systems, and variable-depth sonar to counter layering and refraction, and this gives better results than hull-mounted systems.

This is a turn-key project, with 70% Australian industry involvement, and 80% of the design work. There were over one million documents, and 40 000 production packs, each with between 2 and 50 drawings or documents, most of which were prepared in Australia. The trials program, for example, was extensive, lasting over six months (compared to six days for trials on a recent US-built aircraft carrier).

He then showed a video of the basis vessels for the Huon class, which were the Gaeta variant of the Italian Lerici class, designed and built by Intermarine SpA. There were significant changes made to the design to suit the Australian conditions and methods of operation. There are thirty-eight of the Lerici class (and variants) in service or on order around the world including those in the Italian, Thai, Malaysian and Nigerian as well as Australian navies.

A number of factors have contributed to the success of the project, including good relations with subcontractors (some of whom had to be helped, but this contributed to good working relationships), the greenfield site (allowing innovative systems and processes), and the technology transfer from overseas.

The detail design of the vessel was done by ADI using the high-end CAD package Catia. This allowed three-dimensional modelling and visualisation, interference checking and walk-throughs and no mock-ups were required. They also used Maxsurf and Seakeeper for hydrodynamic aspects, finite-element modelling, and Oasis for overall project management.

Significant time was spent on verification (building the product right, and confirming on the right track) and validation (building the right product and confirming that it does what it is supposed to). Significant time was also spent on the integration of systems, in particular the combat system, communications system, and sonar, to ensure compatibility.

He then showed a second video, this one on the shock trials which were carried out on HMAS *Hawkesbury*, the second vessel of the class but the first to be wholly built within Australia. These are the only known shock trials to have been carried out prior to delivery, and showed that all units and services continued to function without fault throughout the trial.

The in-service support services are provided by ADI with Thales Underwater Systems as a subcontractor, and involve a number of areas: configuration management (to show what is installed on each vessel and ensure a seamless transition from manufacture to in-service support); systems engineering management (to track design changes, technical investigations and obsolescence management, i.e. manufacturers going out of business); maintenance engineering management (planned maintenance); inventory management (procuring, warehousing and distribution of spares); and training. The necessity for subsequent in-service support influenced many decisions in the construction phase, as can be imagined, and often involved other than minimum-cost solutions!

A five-year contract for routine services was awarded in March 2002 and, because of its success, is becoming the preferred model for future arrangements. The in-service support required a cultural change on the part of the contractor and on the part of the navy. However it can now be applied to other vessels, e.g. the LPAs.

It was elicited during question time that the mould for the vessels was built by Anderson Rae in Newcastle, without having previous experience in this area, from a CAD model provided by Intermarine. The second and subsequent vessels (laid up in Australia) were said to be significantly more fair than the first vessel (laid up in Italy).

There are removal routes for all major items of equipment. These are composite vessels, so it is not an option to cut holes for removal as it would be in, say, a steel vessel. The planning of removal routes was therefore an important part of the design.

Graham Taylor, in proposing the vote of thanks, said that, in contrast to some other shipbuilding projects, we had heard less of the minehunter project than if it had had ongoing problems. The merchant shipping industry would like to emulate navy experience regarding configuration management and obsolescence management, but may not be inclined to pay for it.

Dick den Brinker, Marine Superintendent and Quality Manager for Botany Bay Shipping Group, gave a presentation on *The ISM Code: History, Review and Inspections* to a joint meeting with the IMarEST attended by twenty-three on 31 July. The ISM Code stemmed from a growing number of disasters, exemplified by *Herald of Free Enterprise*, *Kirki*, and *Braer*. It became mandatory for passenger vessels, tankers and bulk carriers on 1 July 1998, and for all other vessels on 1 July 2002.

The ISM Code is a quality system similar, in principle, to the well-known ISO 9000 series. It has thirteen elements:

1. Definitions.
2. Safety and environmental policies.
3. Responsibility and authority.
4. Designated person (the person responsible, who provides the link between the ship and the shore, and who *must* have direct access to top management).
5. Master's responsibility and authority (e.g. the master having the authority to engage tugs would

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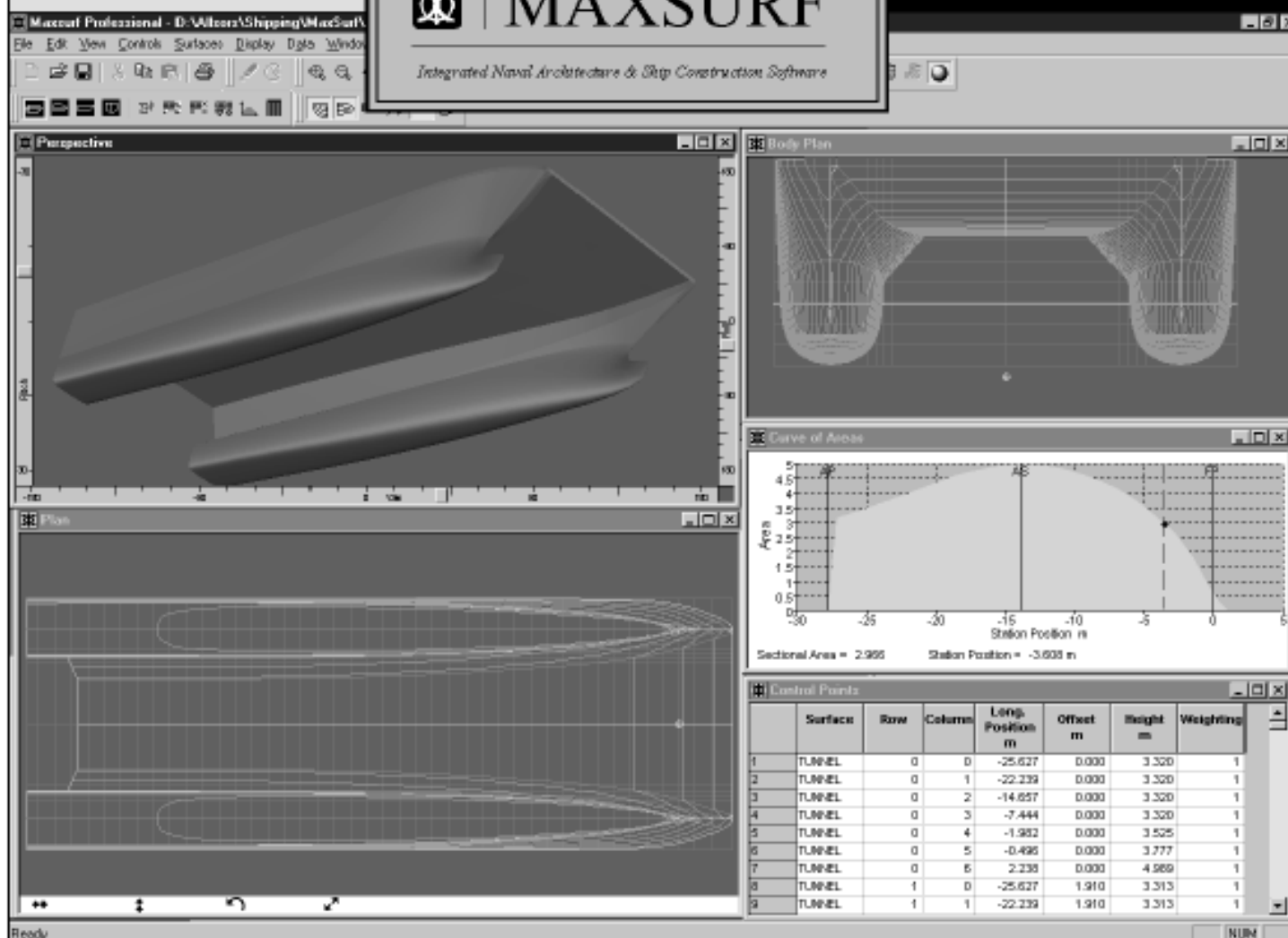
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have prevented *Braer* going aground, instead of having to wait for the owner's approval which came too late).

6. Qualification of personnel (training for a specific vessel, and in a language familiar to the crew).
7. Development of shipboard plans.
8. Emergency response (potential emergencies described, together with procedures to be followed in their event).
9. Reporting of accidents, non-conformities and near-misses.
10. Management of the ship and equipment (maintenance).
11. Documentation.
12. Verification and review.
13. Certification.

The ISM Code itself is a remarkably slim tome: about twenty A5 pages. It describes principles applicable in a wide range of scenarios, and leaves the specific implementation to the company.

How does it work in practice? The key lies in the Policy Manual, which is prepared by the company. In this case, more is *not* better, as the more there is, the more you have to follow! The manual is forwarded to the flag state to check for compliance with the thirteen elements. If the manual complies, it is distributed, and an Interim Safety Management Certificate (SMC) is issued, valid for three months. A representative of the flag state subsequently checks the master and senior officers of the vessel for their understanding of the ISM Code. After three months, the company must do an internal audit, covering all sections. This is followed by an external audit by the flag state and, if no major non-conformities, the Document of Compliance is issued, valid for five years. The ship is then subjected to an external audit and, if no major non-conformities, the Safety Management Certificate is issued, valid for five years.

The auditing standards of a small minority leave a lot to be desired. It remains a mystery how so many vessels, with no manuals on board, could be deemed to comply by the required date: no vessels ceased trading because of non-compliance! The ISO 9000 series contains 136 uses of "shall" (i.e. *must*). The ISM Code, on the other hand, contains 48 uses of "should" (i.e. *not* mandatory), which could be improved by changing to "shall" to remove the escape hatch.

There are differences between an audit, a survey, and an inspection. An audit is an independent documentation process to verify that the procedures are in place. A survey is a check on the seaworthiness of the ship at a specific date. An inspection is a yes/no check to list of questions. Auditors, surveyors and inspectors need training in what they are doing, as audits and inspections are new in the marine field.

On the documentation side, more is not better as, the more there is written, the less chance there is of someone reading and understanding it. The material must also be logical, as the crew will not follow it if it is not. The best systems are those which have been written by the company personnel and ship's crew, as they then have "ownership" of the input.

The ISM Code could be the greatest piece of marine

legislation ever. But it will only become that if it does not become a paper mountain, limiting the operations which are the lifeblood of the company.

A browse of the Internet will reveal off-the-shelf systems available, claiming compliance with the ISM Code for \$2500. However, real compliance cannot be bought so easily, and such quick-fix solutions are vulnerable to port-state inspections.

The way to ensure success of the ISM Code is for the owner to shoulder the main responsibility and ensure the proper training of all concerned. The accountant can quickly tell him/her that, in the long run, the company will be saving money, because an accident is horrendously expensive. Some of the responsibility also lies with the insurers who, previously, would insure anything which floated but are now becoming interested in the ISM Code, and the charterers who, while always seeking the lowest freight rate, should only use safe vessels.

Phil Helmore

Queensland

The Queensland Section Committee met by teleconferencing between Brisbane (Yeronga Institute of TAFE), Noosa, Mackay and Cairns on 4 June. The section also held a technical meeting at Yeronga Institute of TAFE on 9 July teleconferencing to Cairns and Mackay.

The technical presentation was given by Peter Yallamus of Sound Control Pty Ltd on the subject *Shipboard Noise Control*. The presentation was very professionally presented with Powerpoint Slides and held the interest of an audience of eighteen for the full duration of the presentation. Many questions were offered which were very competently answered by Peter and other representatives of Sound Control Pty Ltd. The prime message coming through the presentation was that there is still a lot that can be done to reduce noise in ships and boats with the help of noise specialist involvement in the early stages of the design process.

Brian Robson

Western Australia

Technical meetings

In May A Prof. Charitha Pattiaratchi of the University of Western Australia gave an absorbing talk on *The Unique Marine Environment of Western Australia*. He focussed on the Leeuwin Current and the large tidal ranges in the north-west.

In June Kalevi Savolainen, Technical Manager of Strategic Marine, presented *An Overview of the Singapore Police Boat Project* and described the issues leading to the successful completion of the Australian/Singapore joint venture. Mori Flapan, Technical Adviser to the NMSC on vessel standards and technology, gave a presentation on *The New National Standard for Commercial Vessels*.

At the July meeting David Amble and John Smith presented *A Summary of North West Shelf LNG Shipping*. They covered the design concept of the eight LNG carriers which now service the shelf and the operational experience of the past twelve years.

Library

The RINA WA library continues to grow, with over 600 entries in the recently-computerised catalogue. Committee members John Wood and Steve Harler have worked hard to achieve this. The catalogue index has been distributed electronically to all WA members.

Social

The inaugural RINA WA Golf Day was held on Sunday 19 May, attracting nineteen participants. Matthew Klingberg was first, with Richard Liley second, and first on handicap. Organiser Roger Best won the prize for the longest drive. Water hazards didn't appear to be a problem, thanks no doubt to the players' professional experience with such matters.

Kim Klaka

Victoria

Three technical presentations have been given to the members of RINA and IMarEST in Victoria over the last few months.

On 21 May Dr Paul Sincock from the Australian Marine and Offshore Group (AMOG) Consulting gave an excellent presentation on *Numerical Modelling of Floating Structures*. Paul presented a range of problems that he had encountered during his career. These ranged from the dynamic behaviour of compliant structures through to the motions of single-point moored ships in confused seaways. Although the topic was of a complex nature, Paul described all of the issues in a clear and concise way before demonstrating the results with simulations.

In June Peter Wickham from P&O Maritime Services presented a paper on *Commercial Shipping Options for the Military*. The paper was written from the perspective of an Australian-based ship owner and operator who specialises in the provision of long-term shipping services to the Australian Government, the offshore and onshore mining industry as well as the wider resource and shipping communities. It was presented at the recent Pacific 2002 International Maritime Conference held in Sydney in January early this year.

Peter outlined where, in many cases, commercial shipping services have been used in a military environment in the past. While there are many differences between a traditional warship and a modern container ship or large offshore supply vessel, there are also many similarities. These were examined and the benefits of both types of operations were highlighted. Six types of commercial vessels were briefly described in the context of their possible use in a military role. These included;

- Cruise ships and ferries,
- Offshore supply vessels and research vessels,
- Fast multi-hulls,
- Container vessels and amphibious ships,
- Small coastal vessels, and
- Tankers.

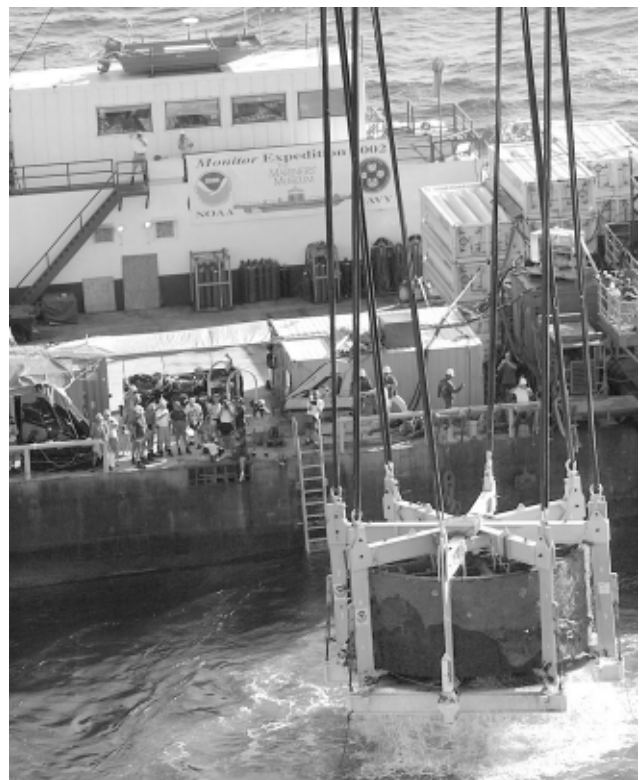
Depending on the role and circumstances, there are a number of advantages to governments in taking one or more of these options and Peter offered his personal views to support them. Finally, some suggestions for the future were discussed. The

paper concluded with a vibrant discussion amongst the members on the topical role of commercial standards and military vessels.

July's technical meeting was something totally different. Marc Middleton from Ozmotech gave a presentation entitled *The Elimination of the Need for Landfill and the Reduction of Domestic and Industrial Waste*. Ozmotech Pty Ltd is a company whose core business is the elimination of the need for waste landfill throughout the world. The central process owned by the company focuses upon the reduction of domestic, commercial, high-moisture, hazardous and toxic wastes to dramatically low volumes, with zero or minimal emissions into the atmosphere, and expanding the process to include energy generation. Marc's paper focused upon Ozmotech's process in the reduction of domestic and industrial waste. At first sight this may seem far from the realms of naval architects and marine engineers; however, its application for ocean going ships may not be too far away — an ideal solution for the waste generated on cruise ships! A unit for reducing plastic to fuels is currently available and the US Army has a system on trial.

Stuart Cannon

The revolving gun turret from the civil war era Ironclad ship USS *Monitor* is lifted from the ocean floor off the coast of Cape Hatteras, NC, on 5 August 2002, and placed onto the derrick barge *Wotan*. US Navy divers assigned to Mobile Diving and Salvage Unit 2 (MDSU-2) provided expert deep-sea salvage crews to assist the National Oceanic and Atmospheric Administration (NOAA) to recover the ship's gun turret, 11-inch (277 mm) Dahlgren cannons, and other artifacts from the historic vessel. Since its designation as the USA's first marine sanctuary in 1975, *Monitor* has been the subject of intense investigation. The turret was the first revolving gun of its kind and will eventually be on public display in the Mariners' Museum in Newport News, VA. The famed warship sank 73 m to the ocean floor during a heavy storm off Cape Hatteras on 31 December 1862. Four officers and 12 men were lost. (US Navy photograph)



COMING EVENTS

NSW Technical Meetings

Technical meetings are generally combined with the Sydney Branch of the IMarEST and held on the fourth Wednesday of each month in the Harricks Auditorium at the Institution of Engineers Australia, 118 Alfred St, North Sydney, starting at 5:30 pm for 6:00 pm and finishing by 8:00 pm. The program of meetings remaining for 2002 (with exceptions noted) is as follows:

- | | |
|--------|--|
| 28 Aug | Graeme Hunter, Rolls Royce, <i>The Electric Ship</i> |
| 23 Sep | Mori Flapan, National Marine Safety Committee, <i>The Fast Craft Section of the New National Standard for Commercial Vessels</i> , (fourth Monday) |
| 23 Oct | Lina Diaz, Waterways Authority, <i>Submissions for Survey and Classification: Do Yours Make the Grade?</i> |
| 5 Dec | SMIX Bash 2002 |

ACT Technical Meetings

- | | |
|---------|--|
| 5 Sep | Tim Gourlay and Tim Lilienthal, AMC, <i>Dynamic Stability Approach for Intact Stability Assessment</i> |
| Sep/Oct | Ian Laverock, <i>Australian Defence Shipbuilding Industry Policy</i> |
| Oct | John Simmons, <i>Procurement for Government Organisations</i> |
| Nov | Dave Magill and Nick Wyatt, <i>Submarine Stability Assessment</i> |

Queensland Technical Meetings

The next technical meeting of the Queensland Section will be held at 1830 on 3 September at the Bulimba Boatyard of Norman Wright and Sons Pty Ltd. The meeting will be held in the Boardroom followed by an inspection of the boatyard's facilities and current work being undertaken. The meeting will address the history of the boatyard and some of the more significant boatbuilding tasks undertaken over the one hundred and ten years that the company has been in continuous operation. Attendance unfortunately will have to be limited to twenty-five due to the size of the venue. Potential attendees should contact the section Secretary to advise of their intentions.

Victorian Technical Meetings

- | | |
|--------|---|
| 17 Sep | IMarEST AGM — <i>A Night of Miscellany</i> |
| 15 Oct | Gaspar Guzsvany, <i>Preliminary Determination of the Safe Maximum Vessel Size for Operation in a Port</i> |

Science and Technology Workshop

The US Navy's Office of Naval Research (ONR), which sponsors science and technology in support of the US Navy and Marine Corps, has recently (June 2002) established an Office in Melbourne. Between 1946 and the founding of the National Science Foundation in 1950, the ONR was the federal government's only agency whose principal mission was the support of basic research. The ONR today funds

work at more than 450 universities, laboratories, and other organisations. The ONR vision is "to inspire and guide innovation that will provide technology-based options for future capabilities".

For the past three centuries, wealth was usually accumulated by those nations that were endowed with rich natural resources, or which had amassed large amounts of capital. However, it is now widely accepted that in the twenty-first century, brainpower, imagination, invention and the organisation of new technologies will be the key strategic industries. As a consequence, some nations have drawn up lists of key technologies that will serve as the engines to drive wealth and prosperity.

In order to introduce itself to the Australian technical community, the ONR will be running a Science and Technology Workshop. This will take place at Monash University on September 19 and 20, 2002. The six themes to be covered are:

1. High-performance Computing
2. Nanotechnology
3. Microsensors and Smart Structures
4. Ship Hydrodynamics
5. Advanced Materials
6. Advances in Mechanics

The convenors are Prof. Rhys Jones, Department of Mechanical Engineering, Monash University, and Dr Peter Majumdar, Head, ONRIFO Australia.

Full details and registration form can be found on the workshop website <http://mec-mail.eng.monash.edu.au/~STW/> (note no www). For more information, contact Ms Sue Hardiman on (03) 9905 3572, fax 9905 1825 or email sue.hardiman@eng.monash.edu.au.

IMTA-Interferry 2002

The 27th Annual IMTA-Interferry Conference will be held on the Gold Coast, Qld, from Monday 14 to Thursday 17 October 2002. The conference program includes a truly international cast of speakers, and topics include conventional, cruise and fast ferries, commercial and military applications, and the regulations. For further information contact IMTA-Interferry Registration at PO Box 1161, Nerang, Qld, on (07) 5596 4234, fax 5596 5629, email info@goldcoastpco.com, or visit their website www.interferry.com.

Ausmarine West 2002

The two-yearly Ausmarine West Exhibition will be held in Fremantle, at the Overseas Passenger Terminal, from 29 to 31 October 2002. Ausmarine is one of Australia's leading international commercial and government marine events. It is aimed at owners and operators of fishing boats, tugs, ferries, offshore support vessels, pilot and rescue craft, aquaculture vessels, cargo ships and smaller naval craft. It is a professional show for professional people. For further information contact Mike Orr or Jodie Ramage at Baird Publications on (03) 9645 0411, fax 9645 0475, email marinfo@baird.com.au, or their website www.baird.com.au.



Royal Institution of Naval Architects — WA Section
presents

HIGH SPEED CRAFT TECHNOLOGY AND OPERATION

2 pm — 5.30 pm, 31 October, 2002

Fremantle Passenger Terminal.

A half-day conference held in conjunction with **Ausmarine 2002** on the topic of technical issues facing designers and builders of high-speed vessels. Topics covered will include:

- **Impact of technology on delivery trips**
- **Operation in confined channels**
- **Progress in ferry design**
- **The continuing role of ship model tests**
- **Prediction of catamaran slamming**

To reserve your place fax or email Jim Black (08) 9437 3064, service@austal.com. You are invited to join the speakers for a post conference dinner and drinks in Fremantle (cost not included in registration fee)

This conference is **FREE** for RINA members and full time students (membership no. and proof of enrolment respectively, required with registration)

Cost for non-members \$35 (may be tax deductible)

Cheques payable to RINA (WA), sent to PO Box 193, Palmyra, WA 6957

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RINA at Ausmarine West 2002

The Western Australian Section of RINA will have a stand at the Ausmarine West 2002 Exhibition, jointly with IMarEST, for the three days 29 to 31 October.

High-speed Craft Technology and Operation

The Western Australian Section of RINA will hold a mini conference of their own in conjunction with Ausmarine West 2002 on 31 October 2002 from 2 pm to 5:30 pm. The conference will cover the technical issues facing designers, builders and operators of high speed vessels, and topics include: the impact of technology on delivery trips, operation in confined channels, progress in ferry design, the continuing role of ship model tests, and prediction of catamaran slamming. The conference is *free* for RINA members and full-time students. Details are provided in the advertisement in this issue. For further information contact Jim Black on (08) 9410 1111 or email service@austal.com.

Maxsurf Workshop

Formation Design Systems will hold a workshop on their Maxsurf hull-generation software on 1 November at the Overseas Passenger Terminal, Fremantle. For further information contact Patrick Couser on (08) 9335 1522 or email info@formsys.com.

High-performance Yacht Design Conference

The University of Auckland, Massey University, and the Royal Institution of Naval Architects (New Zealand Division) will hold an international conference on High-performance Yacht Design on 4–6 December 2002. The conference is scheduled for the middle of the Louis Vuitton Challenger Series to be held in Auckland, New Zealand, in the lead up to the 2003 America's Cup, and shortly after the finish of the Volvo Ocean Race.

The conference will be held at the School of Engineering at The University of Auckland. There will be a welcoming evening function at the New Zealand National Maritime Museum, and a dinner at the Royal New Zealand Yacht Squadron. The conference will provide a forum where naval architects, engineers, designers and researchers can discuss technical aspects of the design and development of high-performance yachts and power craft.

Registration may be done directly on the website, or registration forms may be downloaded and posted. For further details visit the website www.hpyacht.org.nz, or contact B. Woods on +64-9-443 9799 ext. 9560 or email b.woods@massey.ac.nz.

GENERAL NEWS

Contract Signed for Amphibious Watercraft

Minister for Defence Robert Hill announced on 17 July the signing of a \$32.73 million contract with Newcastle shipbuilder ADI Limited for the design and construction of six Amphibious Watercraft for the Australian Army.

Senator Hill also announced that a contract for \$10.66 million has been concurrently signed with ADI Limited to provide 15 years through-life support for the watercraft.

These lightweight vessels, to be built from aluminium and powered by two diesel engines and waterjet propulsion, will build on the total amphibious capability of the Australian Defence Force.

Senator Hill said the new watercraft will enable the Army to deploy greater amounts of tanks, vehicles, soldiers and supplies from ship to beach in a significantly shorter time than is currently possible with the existing capability. In particular, the new watercraft will improve the discharge rate of unloading cargo by more than 30 per cent.

Senator Hill said the new watercraft will be carried on the decks of the Royal Australian Navy ships HMAS *Manoora* and HMAS *Kanimbla*. The craft will be based in Townsville at the 10 Force Support Battalion at all other times.

The first watercraft is planned to undergo extensive trials late next year with the final craft expected to be finished in 2005.

Oceanfast to Build Maxi Yachts for Antarctica Cup

World-renowned super-yacht builder Oceanfast, part of the Austal group of companies, is to build the 25 m maxi yachts that will contest the world's richest yacht race, the Antarctica Cup, which starts in December 2004.

Up to fifteen of these Ron Holland-designed maxi yachts will be built. Oceanfast have a worldwide reputation for building high quality luxury super yachts, with a client list that includes golfer Greg Norman, and the Sultan of Brunei.

The Antarctica Cup is a 14 500 n mile, non-stop, dash around the bottom of the planet, starting and finishing in Fremantle, and with a total of US\$6.4 million in prize money.

John Rothwell, chairman of Austal Limited, is delighted that Oceanfast will make such a positive contribution to this international event, and commented:

'This innovative event will bring a very positive focus for Western Australia and, although these spectacular yachts will not represent a new product line for Oceanfast, we look forward to producing the yachts to the very high standard typical of Oceanfast's world-class motor yachts.'

Fremantle businessman Bob Williams, who is the instigator and chairman of the Antarctica Cup said that awarding the contract to Oceanfast was a major step forward for the event.

'Having the boats built by Oceanfast will give our competitors the confidence they need to take on the infamous Southern Ocean, and push themselves and their crews to the

High Performance Yacht Design 2002

Conference - Auckland, New Zealand, December 2002

**Book travel & accommodation early,
due to Louis Vuitton Cup and America's Cup.**

Conference Outline

The inaugural High Performance Yacht Design Conference will be hosted by The Royal Institution of Naval Architects, The University of Auckland and Massey University from the 3rd - 6th December this year. With sessions to be held over three days this represents the first international technical conference on yacht design ever to be held in New Zealand and is already recognised as a significant event for the international design community.

The conference's technical review panel has received an extremely high standard of submissions and has accepted 35 abstracts from researchers, engineers and designers from 12 countries. A large proportion of the world's most respected names in the yacht research field have submitted papers for the conference, including a significant number of key figures in the America's Cup design arena.

Topics include power as well as sailing yachts and research subjects being presented range from aerodynamic modelling and wind tunnel testing of sails, through computational fluid dynamics, developments in the use of strip theory in the analysis of planing motorboat motions to finite element structural analysis techniques. A preliminary list of accepted titles and authors can be viewed on the conference website: <http://www.hpyacht.org.nz>

Conference Dates and Venue

The conference will be held in Auckland, New Zealand, on the **3rd - 6th December, 2002.**

The venue is **The University of Auckland, Conference Centre**, 22 Symonds Street.

The welcoming evening function is at the **New Zealand National Maritime Museum**, Cnr. Quay Street & Hobson Wharf, Auckland, on Tuesday 3rd December.

The Dinner is at the **Royal New Zealand Yacht Squadron** (Holder of the America's Cup) at Westhaven, Auckland, on Wednesday 4th December.

Key Partners

The conference will be hosted by:

The University of Auckland <http://www.auckland.ac.nz>

Massey University <http://www.massey.ac.nz>

The Royal Institution of Naval Architects <http://www.rina.org.uk>

Registration

Fees: Per person in NZ dollars. GST included.
(Fees shown in brackets if paid after 30th September)

RINA Members: \$735.00 (\$835.00)
Non-RINA Members: \$845.00 (\$945.00)
Full-time Student: \$560.00 (\$660.00)

Options for Registering

- 1) Use the **secure registration** form on our website at:
<http://www.hpyacht.org.nz>
- 2) Download the Acrobat format application form, fill in and return with your payment by Fax or mail.
- 3) Contact for a hard copy form:
RINA "High Performance Yacht Design Conference 2002"
Private Bag 102904, NSMC Auckland, New Zealand.
Facsimile: 64-9-4140814

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of Naval Architects



HIGH PERFORMANCE YACHT
DESIGN CONFERENCE 2002
AUCKLAND NZ

limits, in what promises to be one of the most exciting sailing races ever, involving national teams in fully-crewed yachts.'

The Antarctica Cup has already attracted high-quality entries from the United States, Britain, the Netherlands and Australia, with further entries expected soon from Brazil, Denmark, France, New Zealand and Ireland.

Since the 18th Century the Antarctic region has fascinated mankind and inspired some of the world's most heroic exploration and sailing adventures. The Antarctica Cup hopes to further enhance this fascination whilst promoting the Port of Fremantle, Western Australia and Australia as one of the world's premier host venues for international yacht racing.

Tenix launches *Ballarat*

Tenix Defence launched the eighth Anzac-class frigate at Williamstown on 25 May 2002. The Melbourne biochemist Dr Susanna Herd named the ship *Ballarat* in honour of the Bathurst-class minesweeper which served with distinction in the Pacific in World War II. Dr Herd is the daughter of Able Seaman Robert Herd who served on HMAS *Ballarat* from 11 November 1942 until 20 July 1943. The able seaman is better known to the readers of *The ANA* as naval architect Bob Herd, Hon. FRINA.

Ballarat was the most complete of the class at launching so far with a launch displacement of 2 335 t, approximately 84% of her completion lightship.

The managing director of the Tenix Group, Mr Paul Salteri, said the success of the Anzac Ship Project was a testament to the quality of Australian workmanship and engineering ingenuity.

'The Tenix-built Anzac frigates have proved to be a sophisticated world-class vessel capable of meeting the operational and strategic needs of both the Royal Australian and Royal New Zealand Navies,' he said.

Tenix has delivered HMA Ships *Anzac*, *Arunta*, *Warramunga* and *Stuart* to the RAN and HMNZ Ships *Te Kaha* and *Te Mana* to the RNZN.

The Commonwealth awarded the Anzac Ship Project contract to Tenix Defence in 1989. This 17-year, fixed-price contract is currently worth approximately A\$6 billion and is the largest and arguably most successful defence contract ever awarded in Australia. The project is providing long-term benefits for the economies of Australia and New Zealand, involving more than 1 300 companies with 73% local industry content and almost 8 000 jobs.

Ballarat will now be fitted out with combat and communications systems and hardware. The ship is scheduled for delivery to the RAN in mid-2004.

The first module of the ninth ship *Toowoomba* is to be placed on the slipway in August 2002.

The latest Anzac-class frigate to be completed, HMAS *Stuart* will be the first of the class to be based in Sydney and was commissioned on Saturday 17 August 2002
(Photograph courtesy Tenix)





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Patrol Boat Tender Shortlist Announced

On 28 June the Minister for Defence, Senator the Hon. Robert Hill, announced that three companies have been short-listed to tender for the supply of patrol boats for the Royal Australian Navy. The short-listed tenderers are ADI, Defence Maritime Services partnering with Austal, and Tenix.

ADI would construct the boats in Newcastle, DMS and Tenix in Perth — providing significant economic and employment opportunities in these areas.

‘Competition for the final shortlist to go on to stage two of the contract process was intense — highlighting the fact that Australia has a competitive small vessel shipbuilding industry,’ Senator Hill said. ‘Nine companies provided tenders, seven of which qualified to produce the vessels.’

‘The short-listed tenderers were selected through a robust process based on merit in accordance with the criteria laid down in the request for tender and the information offered in company responses.

‘The final three companies selected to go to the next stage of the tender process were competitive and proposed to meet the Australian industry involvement targets for construction (65 per cent) and in-service support (90 per cent).

‘Both Cairns and Darwin, where the new boats are expected to be operated from, should also benefit from the through-life logistics support activities that will take place there.’

Senator Hill said other regions were also likely to benefit as individual systems and equipment fitted to the boats were likely to be sourced and supported from companies based throughout Australia.

After evaluating two possible procurement options, the Government has decided to directly purchase the boats. The use of private financing to deliver the boats and associated through-life support was also considered.

However, advice provided to the Government indicated that there was uncertainty about whether the requisite capability could be provided on a value-for-money basis while also ensuring that the transaction would be classified as an operating lease for accounting purposes.

The short-listed companies will be invited to provide detailed tender proposals by the end of October 2002. Defence expects to be in a position to recommend to Government a preferred tenderer by late this year, with a view to signing the contract in the New Year.

This would ensure that the replacement patrol boats would be ready for service in the second half of 2004, consistent with the Government’s 2000 Defence White Paper commitments.

‘The current fleet of 15 Fremantle-class patrol boats have served the Navy and Australia well, but they are aging and costly to maintain,’ Senator Hill said.

‘These new vessels will provide the RAN men and women who operate them with a more capable, modern and reliable vessel in which to help them better protect Australia’s coastline. They will also provide the Navy’s patrol boat capability for the next 20 years.’

The Australian Naval Architect

The 15 Fremantle-class patrol boats are close to the end of their service life. These boats make a critical contribution to coastal surveillance and enforcement. They are the primary patrol and response element of the integrated National Civil Surveillance program.

The cost of the purchase of the replacement patrol boats is expected to be around \$375 million under the SEA 1444 project.

The new boats will provide 3 000 operational days per year, of which 1 800 days per year will be directed towards the Coastwatch operations, plus a surge capacity of 600 additional days per year to deal with short-notice contingencies. On average, the Fremantle class have been achieving 2 700 operational days per year.

The new boats will have a range of 3 000 n miles, which will provide a 25% increase over the Fremantle class. They will also have the capability to conduct two concurrent boarding operations at extended ranges from the patrol boat, with two sea boats compared to a single boarding capability on Fremantle class.

The new patrol boats will be able to operate in a greater range of sea conditions, further improving their use at sea. They will have a capacity to carry up to 20 extra people in austere accommodation, whereas the Fremantle class ships have no dedicated additional accommodation.

The state-of-the-art stabilised gun gives improved control and accuracy in rougher weather, to support a full range of surveillance and interdiction roles.

The new patrol boat fleet will be capable of providing a greater level of surveillance capability by spending up to a third more days at sea.

ADI has offered a patrol boat based on the Danish-designed Stanflex 300. The ship would be built using a glass reinforced plastic foam core sandwich construction, similar technology to the construction of the Huon-class Coastal Minehunter. DMS is offering a stretched version of the Austal designed Bay-class patrol boat that is currently in service with Australian Customs. Tenix has offered a variant of the search and rescue patrol boat that they have designed, constructed and delivered to the Philippine Coast Guard.

European Commission moves on Antifouling

The European Commission is proposing measures to prohibit the use of TBT (organotin) antifouling paints on European Union-flagged ships by 1 January 2003 and by 1 January 2008 on all ships, irrespective of their flag. The Commission says the prohibition will encourage member states to ratify as soon as possible the new International Convention on the Control of Harmful Anti-fouling Systems (AFS-Convention) and contribute to an early implementation at international level. The October 2001 AFS-Convention will prohibit the use of harmful organotins in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. The Convention has been open for

signature since 1 February 2002. It will however, only enter into force 12 months after 25 States representing 25% of the world's merchant shipping tonnage have ratified it.

Gaul Expedition

A four-week expedition to survey the underwater wreck of the Hull trawler *Gaul*, which sank amid controversy in 1974 in the Barents Sea, was expected to sail from Aberdeen at the end of June.

The £2m government-funded probe, led by the Marine Accident Investigation Branch and with relatives of *Gaul*'s 34-man crew aboard, sailed on the chartered offshore survey vessel *Seisranger*, operated by Subsea 7. The MAIB hopes that techniques and skills developed during the expedition, which is led by a principal inspector at the MAIB, Keith Dixon, will be useful in future marine investigations. It is also hoped that a closer look at the wreck, which was discovered and filmed by a TV crew in 1997, will close down speculation about the loss of the ship, around which various Cold War theories involving espionage have revolved.

The expedition hopes to supplement the existing photographic evidence, search for any remains of *Gaul*'s crew and establish their identities through DNA profiling, and collect any evidence connected with the espionage allegations. The earlier expedition found an unidentified cable on the seabed, and the wreck festooned with nets.

Lloyd's List, 27 June 2002

Progress with Strategic Industry Plans

The 2002 Defence and Industry Conference was held in Canberra on Monday 24 June. The conference was opened by the Minister for Defence, Senator the Hon. Robert Hill. In his address, the Minister referred to the importance of the role of industry in Australian Defence.

'Whatever the strategic environment, it is the Defence and industry partnership which actually delivers the necessary capabilities and sustains them. Industry is therefore a fundamental component of our national security,' he said. 'The responsibility for addressing the security environment is, in effect, shared by the Government, the Defence organisation and industry.'

The Minister went on to outline a key area of reform — the implementation of a new strategic-alliance approach to Defence industry policy.

'As you know, late last year the Government agreed to implement an approach aimed at sustaining those key industry capabilities that are strategically important to delivering and sustaining ADF capability,' he said.

'The Government is determined to deliver on the commitments it has made in this area.

'A number of key defence industry sectors have been identified, for which the new strategic approach might be applicable. These are:

Naval Shipbuilding and Repair;
Electronic Systems;
Aerospace; and
Land and Weapons Systems.

'Work is well under way in developing 'Sector Plans' for these areas.

'The sector plans are being developed by the Department in co-operation with government and industry stakeholders.

'In particular, four sector-specific working groups, with significant industry representation, have been established under the auspices of a sub-committee of the Defence and Industry Advisory Council.

'One clear message from the working groups is that each sector is diverse, complex and to a large extent unique. What is appropriate in one sector will not necessarily translate to another.

'In the case of naval shipbuilding and repair, the sector plan will examine the Navy's current and future requirements, Australia's current industrial capabilities and capacity, and Defence's long-term requirements.

'Based on this information, the plan will identify those industry capabilities and skills required to meet Defence's requirements. It will also describe a contractual and corporate governance framework for a consolidated industry structure and include a detailed implementation framework.'

The Minister said that the Government is committed to longer-term reform through industry policy to ensure that Australia can deliver and sustain strategic capability well into the future.

New Shipyard from Old

Old shipyard sites in large cities are usually recycled as housing or parks, so the announcement by the Drivas Property Group that the historic ADI/Halvorsen site at Putney on Sydney Harbour is to be redeveloped for maritime industry is a welcome change.

The plans to rehabilitate the 1.5 hectare site and refurbish the boatshed have been developed over the past three years in consultation with NSW Planning and the NSW Waterways Authority and are consistent with the NSW Government's 'Working Harbour' policy.

The developers plan to upgrade the historic shed and slipways and install a 100 t travel lift to enable hard-stand maintenance of large pleasure and commercial craft which currently have to visit Newcastle or Wollongong. Boat storage facilities for recreational vessels will be built and facilities will be provided for local water-based users such as rowing, sailing and canoe clubs. The site will be opened for pedestrian and vehicle access with extensive landscaping.

Boat building was begun on the site in 1937 by Halvorsen's Boats and it made a major contribution to defence during World War II with the construction of many small ships including Fairmile B class motor launches.

Work on the Putney site should start early in 2003 and be completed in about twelve months.

New South Wales Industry News

New Design

North West Bay Ships have secured contracts for a 60 m luxury motor yacht and a 39 m catamaran ferry.

The 60 m motor yacht is based on the trimaran platform, specifically selected for improved seakeeping performance, with the added benefits of large deck areas and excellent efficiency. Principal particulars are:

Length OA	59.1 m
Beam	15.2 m
Depth	5.6 m
Class	DNV LC Yacht R0 EO
Complement	18 Guests, 13 crew
Fuel	100 000 L

The machinery package is interesting, consisting of a single 16V 4000 MTU engine driving a single propeller for a top speed of 20 knots. An auxiliary electric propulsion system will be fitted, allowing whisper-quiet running at speeds up to 11 knots.

The 39 m catamaran project for the Red Funnel Group was selected through an international tender process, to operate between Southampton and Cowes in the UK on a 30 minute schedule. Named *Red Jet 4*, the new vessel will supplement three existing FBM catamarans operated by Red Funnel on the route. Delivery is scheduled for March 2003. Principal particulars are:

Length OA	39.8 m
Beam	10.8 m
Depth	3.05 m
Class	DNV HSLC R4 Passenger, UK MCA Class IV
Speed	35 knots fully loaded
Passengers	277 passengers, all located on single deck for rapid embarkation.
Machinery	2 x MTU 12V 4000 engines delivering 1740 kW brake power at 2000 rpm 2 x MJP 650 steerable and reversing waterjets

Design is proceeding apace at the Sydney office, and construction of both vessels has commenced at the Hobart yard.

Marine Technical Services has secured a contract for the design of a 55 tonne bollard pull tug for an east-coast operator. Dimensions are firming up at around 32 m in length, 10.2 m beam, draft 4.5 m and power at about 3300 kW. Design is proceeding apace, with tenders for the machinery package expected to be called soon, and tenders for construction to follow.

Crowther Multihulls is designing two catamarans for shipbuilders in the USA, one of length 38 m and another of length 42 m. Each vessel will be powered by four engines and operate at 40 knots.

New Construction

In late August a 30 m low-wash catamaran ferry designed by Crowther Multihulls will be launched in Hobart for operation on the Gordon River. This vessel will be the third vessel ordered from the operator and the fourth Crowther-designed catamaran ferry to operate on the Gordon river.

In mid August a 30 m whale-watching catamaran designed by Crowther Multihulls will be launched in Brisbane for operation on Moreton Bay.

In early November a 21 m catamaran designed by Crowther Multihulls will be launched in Geraldton for operation as a surf/dive charter catamaran in Indonesia.

Also in November three 16 m monohull crewboats designed by Crowther Multihulls will be launched in Brisbane for an Indonesian operator.

Around and About

Mark Gairey, Director General of Submarines for the Department of Defence (Navy), gave a presentation on *Project Management Aspects of the Collins-class Submarines* to a meeting of the Business and Management Branch of the Institution of Engineers, Australia, attended by forty-five on 7 May in the Harricks Auditorium at the Institution of Engineers, Australia, Milsons Point. Mark addressed aspects of project management in the world of submarines where extremes of complexity, operational requirements and emerging technology are the norm. The Collins-class submarine project has received some notoriety and sensational media comment. However, there has been little reporting of the major successes of and benefits from this project. There were challenges inherent in the selection, building in Australia, commissioning, operating and supporting a new fleet of submarines. Sophisticated project management and technological advances were pivotal elements. Mark outlined the approaches taken to managing both the overall project and the many sub-projects that contributed to the highly successful acquisition and in-service support of Australia's Collins-class Submarines.

Phil Helmore

WA Industry News

Strategic Marine active

Strategic Marine continues their busy schedule for 2002. They have laid the keel of a 40 m crew boat for Asia and are assembling frames and structural components of four 20 m patrol boats for Malaysia.

Austal collaborates with US Defence Team to further High-speed Military Vessel Development

The 101 m high-speed theatre support vessel chartered to the US military by Austal Ships has travelled in excess of 85 000 n miles at an operational availability rate of practically 100%. *WestPac Express* is now also playing an important role in the development process for future advanced vessel concepts for military use.

The US Army Tank-automotive and Armaments Command (TACOM) has tasked the Carderock Division of the Naval Surface Warfare Center (NSWCCD) to conduct a range of propulsion, fuel economy and seakeeping trials on the Austal TSV 101. This information will not only provide baseline technical data for the wider Theatre Support Vessel program but will also establish performance thresholds against which future advanced vessel concepts can be compared. Staff from NSWCCD, which is the US Navy's centre of excellence for ships and ship systems, visited *WestPac Express* in Japan recently for the purposes of installing specialised testing equipment to monitor the vessel's performance.

'Austal considers the enhancement of the military sector's understanding of the true capabilities of its high-speed craft platforms to be an important process in furthering their use in defence applications, and is thus keen to assist in projects of this type,' commented Austal's Managing Director, Mr Bob McKinnon.

That role includes the deployment of troops, vehicles and cargo in the Western Pacific region for the Third Marine Expeditionary Force (III MEF) of the US Marine Corps based in Okinawa, Japan. *WestPac Express* arrived in Okinawa on 12 July 2001 to begin a proof-of-concept period of operation. The success of the vessel during this period led to a three-year contract with the US Military Sealift Command being signed in January this year — the first time the US Military has contracted a commercial vessel of this type for military support.

In the 12 months since the Austal catamaran arrived in Okinawa it has carried a total of 18 768 military personnel and 11 985 tonnes of military hardware to a range of locations including Yokohama, Guam, South Korea, Thailand and The Philippines. This represents a total payload of approximately 13 770 tonnes for the year. Capable of sustaining loaded speeds of 36 kn, *WestPac Express* can deploy a complete battalion of 970 marines together with up to 550 t of vehicles and equipment, in one lift, with considerable strategic and cost advantages. The ship has a range of 1 250 n miles at an average speed of 35 kn while carrying 400 t of payload in addition to the fuel for the voyage, with a 10% fuel reserve for contingencies.

In addition to theatre support vessels, Austal Ships' military range now includes high-speed vessels developed for specific needs such as mine countermeasures command ships that are capable of landing and deploying helicopters as well as carrying a range of other military hardware and personnel.

Tasmanian Industry News

North West Bay Ships are extending their facilities at Margate in Hobart to enclose a 70 m x 50 m building bay to accommodate an increased demand in production. Current vessels under construction include a 60 m trimaran luxury motor yacht and a 39 m low-wash catamaran ferry for the Red Funnel Group Ltd in the UK (see *News from NSW* in this issue for design details).

Rob Tulk

Queensland Industry News

It would seem that the boat building business is booming in Brisbane as shown by the following projects on hand at Norman R. Wright and Sons Pty Ltd (NRW) at Bulimba.



9.75 m Classic Styled Cruiser

The first hull is intended to feature at the Sydney Boat show in August. The boat is of composite construction.

Designer : NRW

Builder: Palm Beach Motor Yachts

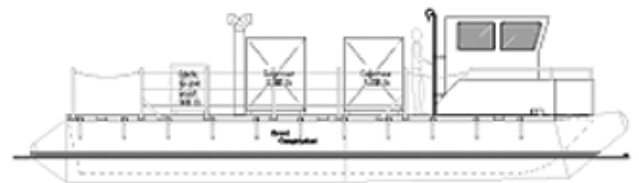


12.5 m Classic Styled Cruiser

This boat is being built for a Brisbane client who appreciates the classic look. It is of composite construction with a Mahogany interior and is powered by twin 260 kw Yanmar diesels.

Designer : NRW

Builder: Sub-contract



12.2 m Survey Boat

Woody Enterprises are currently building this aluminium boat for an American company. The vessel will be used for hydrographic surveying of the ocean's bottom, and is powered by two 150 kw Volvo diesels. The boat has been designed to be disassembled and fitted into two 12 m shipping containers for transporting.

Designer : NRW

Builder: Woody Enterprises

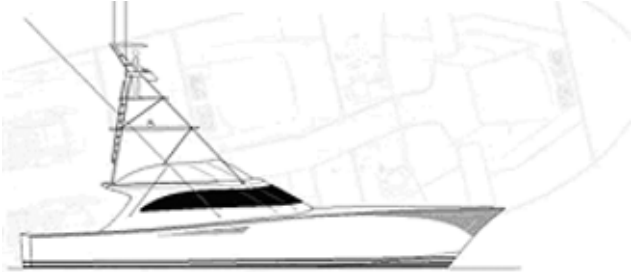


19.5 m Long-range Luxury Motor Boat

This vessel is nearing completion. The boat features a single main engine, 300 kw Cummins N14 on the centreline, with a 60 kw Cummins wing engine for emergency propulsion. There are two Onan generators on board, 11.5 kVA and 21.5 kVA, and bow and stern thrusters. The boat has a bulbous bow and Niad stabiliser providing a comfortable ride at sea.

Designer: NRW

Builder: NRW



17.7 m Game Fishing Boat

This boat will be launched later this year for a Sydney client who has a passion for game fishing. It is powered by two MAN 780 kw engines, and is expected to reach speeds above 30 kn. The boat is of composite construction and built to survey. A fully custom interior has been designed to suit the owner's requirement for luxury such as large plasma screens, DVD players and state-of-the-art stereo equipment.

Designer: NRW

Builder: NRW

An MH-60S Knighthawk multi-mission helicopter makes an approach to Incat-built *Joint Venture* (HSV-X1) during operations off the southern California coast on 2 August 2002. The Knighthawk is a newly-designed helicopter for the Navy which uses the Black Hawk airframe to provide a larger cabin area for cargo and passenger transport, while keeping the automatic rotor blade folding system and rapid folding tail pylon for shipboard operations. *Joint Venture* is participating in Fleet Battle Experiment Juliet (FBE-J) as part of operations supporting Millennium Challenge 2002 (MC-02). (US Navy photograph)



19.5 m Long-range Luxury Motor Boat

This boat will be completed later this year. The client is based in Noosa and plans on doing a lot of coastal cruising. The boat has two Cummins 186 kw engines and one 14 kVA Seawasp generator, and one single bow thruster.

Designer: NRW

Builder: NRW

Other activities in the Brisbane area include Aluminium Marine who have progressed the construction of their three 12 m Police Patrol Vessels. The first of these is to be launched this month. Also being progressed is their 12 m landing barge for the local National Parks and Wildlife Service.

Brisbane Ship Constructions will be shortly launching their 20 m Patrol Boat for the Department of Primary Industries.

South Pacific Marine is building a 29 m whale-watching catamaran designed by Crowther Multihulls.

Also under construction is a 30 m steel landing barge designed by local naval architect Sean Owen and the extension of a ro-ro passenger ferry to 48 m.

Stingray Boats has recently delivered a Search and Rescue boat to the local Volunteer Marine Rescue Association, while still under construction is a 12 m dive/thrill boat, powered by three of the new 168 kw, 4 stroke, Yamaha outboard motors.

Brian Robson

Assisting *Nottingham* — an Engineer's Perspective

LCDR Giles W Rinckes RNZN

The Type 42 destroyer HMS Nottingham left Cairns on Thursday 4 July 2002 on passage to Wellington as part of a Pacific deployment. On the morning of Sunday 7 July a sailor required medical attention and was flown by helicopter to the airport at Lord Howe Island for onward transport to a Sydney hospital. That evening, in deteriorating weather conditions, Nottingham left her anchorage at the northern end of the island and recovered her helicopter. In manoeuvring to recover and stow the helicopter, Nottingham hit Wolf Rock, an isolated pinnacle east of Lord Howe Island. After some minutes, the ship was backed away from the rock and moved to an anchorage in the lee of the island. The New Zealand warships Endeavour and Te Mana were diverted to her assistance. This article was written by LCDR Rinckes of HMNZS Te Mana.

We arrived here on Wednesday morning 10 July and anchored in a spot where the swell has affected us considerably. *Te Mana* does not lie on the anchor very well and every night I am almost thrown out of bed by the motion of the ship — rolling up to 15° either side of the vertical means we are rolling through 30°. The steward setting the breakfast table this morning smashed three glasses!

Well anyway, no matter how bad my situation is, I feel for the crew of *Nottingham*. I visited them on Tuesday afternoon and met the engineer, Ian. He showed me around and I saw the missile magazine flooded, the buckling in the hull just aft of the anchor capstan and the water that was still leaking into the ship. A bad day at the office you might say!

HMS *Nottingham* at sea
(Royal Navy Photograph)



I then saw the underwater video of the damage. The hull plating has been torn off the bottom of the ship for about 10 metres, and then there are very large dents and impressions in the hull where clearly the ship had been bounced on the rocks (for about 10 minutes they think). The fibreglass dome around the sonar had been ripped half off and the sonar transducers were hanging down suspended by a mass of wires. Splits in hull plating further aft showed where the stresses on the hull have been too much to bear. The starboard stabiliser fin was ripped off the shaft that rotates it and one engine room was completely flooded due to the gap around the shaft where the structure had been distorted. As I stood on the foc'sle later, I looked down into the water and could see wings of twisted metal folded out and up from the keel.

The ship made it about 7 n miles from Wolf Rock and anchored. They just let the anchor chain run out and hoped it would grab, they had no idea how much they had let out or even if the end of the chain was still attached to the ship!

The Captain rang down Full Astern to back the ship off the rocks and the engineers took local control of the gas turbines and wound them up past the point where the computers would otherwise have allowed them. They hurriedly erected wooden shoring to stem the flow of water and set up pumps. Communications with the outside world were lost as power supplies to communications gear was shorted out.

Other damage included contamination of water tanks, fuel and lube oil systems, aviation fuel, one engine room flooded which then flowed into a gearbox. Up front, water in two magazines, a mess deck full of water, electronic compartments and storerooms were lost to flooding. It is amazing where water had got in and yet how the ship had survived. The water even leaked up the inside of cables and shorted out switchboards. Still, it says something about warship designs and systems. Also it says a lot about the crew's skills and tenacity. The RN has a proud heritage and they were not going to lose a warship without a fight!

The next day they set about assessing their situation and put up better shoring to stop decks and bulkheads collapsing from the pressure of the water. Since then they have reclaimed some compartments and started systems and equipment back up.

A salvage company and some RAN mine clearance divers have assisted in getting the ship in a better condition to be towed. At first the Captain wanted to steam to a port under his own power but the damage to the ship is such that the foc'sle is not structurally sound and the ship cannot safely be towed ahead or move ahead under its own steam.

Te Mana and *Endeavour* were the only warships available on the east coast of Australia. We have provided personnel to clean up, dry out and erect more shoring to strengthen bulkheads. We had three teams working 6 hours shifts from 0600–1200, 1200–1800 and 1800–midnight. Some of my lads were working in compartments that were surrounded on five sides by water; this makes you very careful about what you hit with a hammer!

We have supplied them with fresh water until they could get their water makers going and making water of good enough quality. Also true Kiwi sense of humour and compassion has helped. Every day for the past three days, a large number of *Nottingham*'s crew have visited for hot showers, laundry services, a rest and a break from their ship. They more than often want to talk about their ordeal. The Petty Officers' Mess has been re-named 'Sherwood Forest' and designated for the *Nottingham* crew. We even have three Chinese laundrymen onboard from *Nottingham* to do the laundry for both ships.

Nottingham's helicopter is grounded due to defects and both *Endeavour*'s boats are defective. So both *Te Mana*'s boats have been going full out for five days. The conditions here are not good — big long swells and windy raining squalls make this dangerous work. I came back from *Nottingham* in the dark the other night and during the boat trip home a squall hit us. Heavy rain, driven by gusts up to 55 knots, slammed into us. The cox'n slowed the boat right down until it passed and I hid under the hood of my heavy raincoat — but could still feel the rain stinging my face and head. Once the squall passed the cox'n could see *Te Mana* and headed in for safety and a cup of hot coffee. Well deserved! Such conditions are hard on the boats but *Te Mana* cox'ns are well skilled and my maintainers know how this operation is relying on the boats being 100% operational.

Today the first of the tugs arrived. The big tug that will tow *Nottingham* is due next. It is envisaged that *Nottingham* will be towed 470 n miles across open ocean to an Australian port with a skeleton crew onboard — instead of the usual 250 crew there may be as few as 35.

HMS Nottingham left Lord Howe Island under tow on Tuesday 6 August. Swire Pacific's Pacific Chieftain towed *Nottingham* with the Hong Kong Salvage and Towage tug



Sailors with temporary shoring inside *Nottingham*
(RNZN Photograph)

Yam O as steering tug. The ships' departure had been delayed for 24 hours by 40 kn winds. The ships arrived on Friday 9 August (see page 37). In Newcastle, *Nottingham* will be de-stored, de-ammunitioned and further strengthened prior to return to the UK by semi-submersible heavy-lift ship in October.

HMS Nottingham at anchor off Lord Howe Island
(Royal Navy Photograph)



Setting a Course for Australia's Naval Shipbuilding Industry

The Australian Strategic Policy Institute (ASPI) recently released a report entitled *Setting a Course for Australia's Naval Shipbuilding and Repair Industry*. The Institute was established by the Commonwealth Government as an independent, non-partisan policy institute. ASPI's aim is to promote Australia's security by contributing fresh ideas to strategic decision-making, and by helping to inform public discussion of strategic and defence issues.

The Government is currently preparing a strategic plan for the Australian naval shipbuilding and repair industry, which is due for completion in September 2002. The outcomes from this process are likely to have a profound impact on the shape of this industry that has such an important role to play in the defence of Australia. The ASPI Policy Report seeks to contribute to the public debate as those outcomes are developed.

The Executive Summary of the report is reproduced below:

Over the past twenty years, having sold off its defence factories, the Federal Government has insisted on arms-length competition for all defence contracts. Then last year the Government announced a new approach. It is looking to reduce competition and instead build long-term relationships with major defence suppliers. Soon the Government will decide how to apply this new approach to shipbuilding—the jewel in the defence industry crown.

Our naval shipbuilding and repair industry is critical because it provides the capacities needed to keep our ships at sea in fighting trim. Repair and maintenance is more important for that than building new ships, although high-profile new ship construction gets more attention.

Problems in the dockyards?

Since the mid-1980s there has been a boom in naval shipbuilding, but many industry observers worry that over the next few years falling demand for new ships and excessive competition will make the industry non-viable. They say that Australia cannot expect to sustain the current three major naval ship builders, pointing to trends overseas, where major consolidation has occurred. So they look to the Government to manage a restructuring of the industry, and to make it easier for the remaining companies to prosper.

But how serious are these problems really? Concerns about future workload are hard to understand. All of the major firms will have contracts for warship upgrades over the next few years, and around 2008 the Government plans to start a major burst of new naval construction. Eight or nine big ships are due to be built in less than a decade, including three or more highly complex air-warfare destroyers. In fact the demand will far outstrip current industry capacity, and new facilities would be needed to build such big ships, in such large numbers, so quickly.

The Australian Submarine Corporation (ASC) faces special problems, because there is little chance of orders for more new submarines. But ASC has a solid future workload in repairing and maintaining the six Collins-class boats, if Defence can make up its mind what it needs, and can allocate the money to pay for it.

With so much work coming, it is hard to conclude that the Government needs to take special measures to help the industry survive. In particular, it is doubtful that the industry has really suffered much from excessive competition. No major shipbuilder has left the industry, and indeed all appear to have made healthy profits.

The Government does have a special problem to solve with ASC, which it wants to sell, having in 2000 effectively compulsorily acquired from Kockums the 50% it did not own. Before it can be sold, the Government will need to resolve uncertainties about the future of submarine repair work, and settle disputes arising from the construction contract and about the ownership of key elements of the Collins design.

A model for reform?

Some Government statements suggest that it would like to address the concerns about the future of the industry by using ASC as a key element in a consolidation of the industry to reduce the number of players. Clearly no decisions have been taken yet, but it seems that if the Government does opt for a major intervention in the industry, it might go for some combination of the following elements:

Sell ASC to one of the other two big shipbuilders, and encourage them to amalgamate, leaving one major shipbuilder.

- Enter a long-term partnering arrangement with the surviving firm, under which that firm would become the prime contractor for all future shipbuilding, with open-book accounting and other modern commercial practices being used to try and ensure value for money.
- Encourage this 'tier one' partner to maintain active competition between a range of 'tier two' subcontractors in order to contain costs, and to develop close linkages with overseas defence technology companies.

- Offer the ‘tier one’ partner a measure of assurance about the future flow of shipbuilding work.

This model would carry a lot of risks. They include:

- With an effective monopoly, the tier-one partner could easily become inefficient.
- Without competitive tendering at the prime contractor level it would be hard to benchmark costs and determine value for money.
- Although modern partnering agreements work well between some commercial firms, Defence might lack the commercial skills to protect the Commonwealth’s interests in such an agreement.
- The Government might lose flexibility to vary the naval shipbuilding program if it was contractually committed to provide its partner with a flow of work.
- An exclusive arrangement with an international technology partner would limit Australia’s defence technology options and negotiating leverage.
- The monopoly tier-one partner would be in a very strong position in relation to its subcontractors, many of them small and medium enterprises. There is a clear risk that power would be abused.
- The problems in naval ship repair and maintenance would remain unresolved.

Clearly the Government is aware of these problems, and will take them into account. On balance, we do not believe that the problems in the industry are great enough to warrant the adoption of a reform model that carries these risks.

Five modest reform proposals

Instead we suggest that the government should adopt five proposals for modest but valuable reform for the naval shipbuilding industry:

- Do not force an outcome on the industry as a whole. Let commercial forces decide how many shipbuilders we can support in this country.
- Smooth out the shipbuilding workload later in the decade, so that the industry does not face a boom-and-bust cycle.
- Reform naval repair and maintenance to better support the ships at sea and the industry.
- Sell ASC to the highest competent bidder, allowing new firms to enter the industry which might be able to bring non-defence work to the corporation.
- Avoid buying Australian-unique systems which seldom offer operational advantages to offset the very high costs and risks they impose.

The ASPI is inviting comments on their report, which can be sent to them at Level 2, Arts House, 40 Macquarie Street, Barton, ACT 2600 or by fax to (02) 6273 9556 or email jointthedebate@aspi.org.au. The full report can be downloaded from www.aspi.org.au.

The Tenix shipyard at Williamstown, Victoria. *Ballarat* on the slipway, *Parramatta* (top) and HMAS *Warramunga* alongside. Modules for *Toowoomba* can be seen beside the Alfred Graving Dock
(Photograph courtesy Tenix)



Wave Generation of High-Speed Ships

Lawrence J. Doctors
The University of New South Wales

Preface

A paper by Cox (2002) on the subject of the decay of waves in the neighbourhood of marine vessels appeared in the previous issue of *The Australian Naval Architect*. Distressingly, the paper contains a number of incorrect statements and inconsistencies. These errors will compound any misunderstanding of the subject and will cause confusion to those naval architects interested in the design of low-wash vessels.

As a researcher and an educator, I find that it is of particular concern to me that *The Australian Naval Architect* should be used to propagate these misconceptions. I have therefore decided to respond in the briefest possible manner.

Scientific Background

The scientific study of wave generation by marine vessels began well over one hundred years ago. The vast majority of this work has centred on the question of a vessel proceeding at a steady speed in water of constant depth. For such problems, the wave field appears unsteady from the point of view of a stationary observer. However, the wave field is steady when viewed by an observer travelling with the vessel. Hence, it is almost universal practice to analyse the wave-generation problem by using a moving coordinate system. This principle allows the time variable to be removed from the mathematical analysis and, hence, to reduce the number of independent variables from four to three.

This principle is taught in every introductory university course on engineering mechanics and, similarly, in every fluid-dynamic course. It is on the same physical basis that wind tunnels and water tunnels can be used. In these two experimental facilities, the model is stationary and the fluid is moving. The concern expressed by Mr Cox (Page 31, Column 1, Paragraph 4) about my method of analysis (employing a moving reference frame) can certainly be dismissed.

In the same vein, the comments of Mr Cox (Page 31, Column 1, Paragraph 5, 6 and 7), regarding wave period, are clearly incorrect. The steady-state method certainly can be used to compute the wave period. Indeed, as a method of verifying the output of their computer programs, experienced researchers will perform a Fourier transform of the output of their unsteady programs and compare them with the results of their steady programs. Similarly, my own programs do compute the wave period using different approaches. This point will be discussed below under the Section dealing with wave measures.

The specific analysis of water waves generated by a moving disturbance has been presented by many authors. The works of both Wehausen and Laitone (1960) and Stoker (1966) are excellent in that the wave pattern generated by a point source has been clearly described. It is noteworthy that these two references are the only two papers that I possess in which it is properly stated that the transverse waves do not truly meet the divergent waves on the Kelvin line. This is because there is a phase difference of one quarter of a period between them. The majority of publications show the two wave systems meeting at a cusp on the Kelvin line, which is not correct. Mr Cox (Page 30, Column 1, Paragraph 3) has also restated this misconception.

In the same paragraph, Mr Cox has made an irrelevant reference to the supposed difficulty of making a measurement precisely at the “cusp point”. Apart from the fact that a cusp does not exist at this point (as noted just above), both predictions and measurements can certainly be made here and there is no reason why agreement between the two approaches should not be possible. Mr Cox’s simultaneous attack on academics is not appreciated either.

Similarly, the comment by Mr Cox (Page 30, Column 1, Paragraph 3) regarding the two decay rates themselves is also definitely incorrect. The decay rate of $1/3$ refers to waves that appear precisely on the Kelvin line and not to the divergent waves. Similarly, the decay rate of $1/2$ refers to waves that appear behind the Kelvin line and not to the transverse waves. This point will be referred to again in connection with Figure 5(b) and Figure 6(b) in this paper.

The comments by Mr Cox (Page 30, Column 2, Paragraph 1) regarding the use of model tests and/or full-scale tests to provide the above-mentioned decay rates are also not true. There are no such tests that cover a sufficiently large wave field that could provide the required data. The truth is that these decay rates are predicted by the theory, which has been presented by Wehausen and Laitone (1960) and Stoker (1966), amongst others.

Additionally, the definition of the near field by Mr Cox (Page 30, Column 2, Paragraph 3) is not correct. The near field for a realistic vessel requires being close in terms of both the vessel length and the typical generated wave lengths. Thus, the size of the near field depends also on the Froude number.

Two examples of the wave system are shown in the two parts of Figure 1. These correspond to depth Froude numbers of 0.2 and 1.5, respectively. The depth Froude number is defined as $F_d = U/\sqrt{gd}$, in which U is the speed of the vessel, g is the acceleration due to gravity, and d is the depth of the water. Results are shown for an air-cushion vehicle and for a Wigley (1934) ship. Specifically, the curves are the zero-elevation-contour lines of the generated wave pattern. It is interesting to see the very close correspondence between the results for two quite different types of marine craft and also with the very powerful phase method of Yih and Zhu (1989).

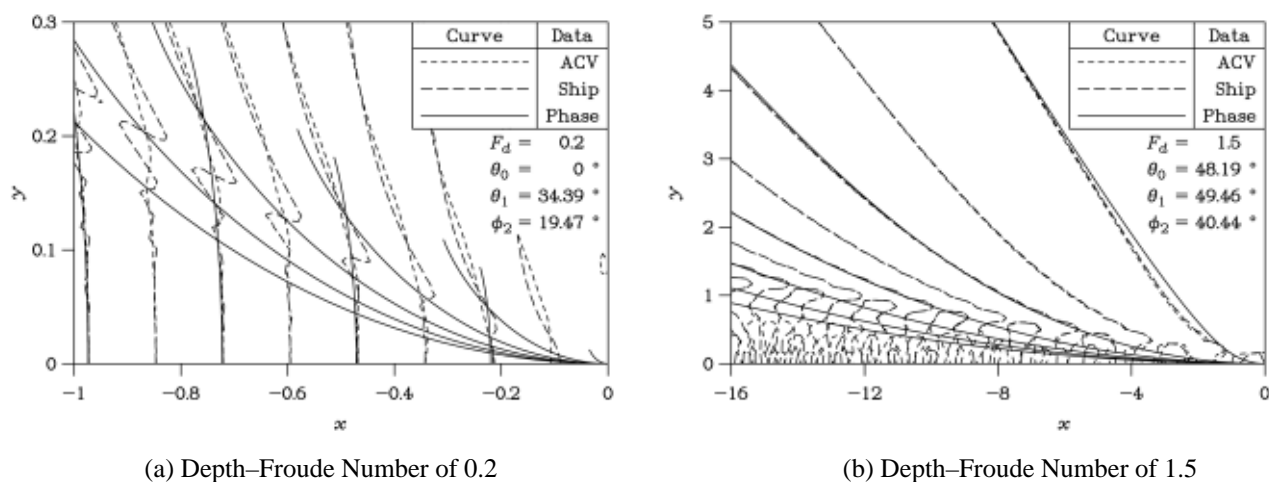


Figure 1: Zero-Elevation-Contour Lines

There are small differences in the shapes of the zero-elevation contour lines, between the phase method and the computed results for the two physical vessels. These differences can be attributed to the fact that the physical vessels possess finite geometric dimensions, which are ignored in the implementation of the phase method.

The fundamental differences between the results for the different depth Froude numbers illustrate the great importance of the depth of the water. The large influence of water depth on wave generation has been pointed out by many researchers. An early example for the case of a hovercraft is that of Newman and Poole (1962).

Another example, relevant particularly to the Australian-designed RiverCat, is the work of Doctors, Renilson, Parker and Hornsby (1991). That paper highlighted the dramatic effects (theoretically and experimentally) of both finite depth and finite width of the waterway on the wave generation. It is therefore not possible to understand the comment of Mr Cox (Page 30, Column 1, Paragraph 2) about his claimed lack of interest in the finite-depth case.

The additional comment by Mr Cox (Page 30, Column 1, Paragraph 2) that simple results do not exist in water of finite depth is not true. This is attested to by the results of calculations in Figure 1(b) and those of many previous researchers. Incidentally, he misuses the term “shallow-water case”. This term applies to water whose depth is so small that simplified, but less exact, mathematical theories may be used.

Wave-Generation Theories

Mr Cox (Page 30, Column 2, Paragraph 5) incorrectly refers to my work as employing computational-fluid dynamics (CFD). Strictly speaking, CFD is a method in which the entire fluid domain is subdivided into small three-dimensional elemental volumes. The Navier-Stokes equations (see Schlichting 1968, for example) are approximated within each volume, using semi-empirical methods. In this way, one attempts to solve the complete fluid-dynamic problem. At this stage, there are no practical CFD programs that can properly predict the wave field at large distances from the vessel. This is because of the very considerable computer resources required, which are not yet available. Indeed, there are still serious doubts as to whether CFD programs are reliable enough, even for resistance predictions, as noted by Sahoo, Doctors and Renilson (1999).

A less ambitious (and certainly more practical) approach to the wave-generation problem involves a distributed singularity system in the (inviscid) potential-flow analysis. In the work of Raven (2000), these singularities (of the simple and efficient Rankine type) are used to model the ship. They are also distributed above the free surface, so that nonlinear effects in the theory can be incorporated. Raven’s computer program RAPID is the result of considerable and careful development. By its nature, however, considerable coverage of the water surface is not possible.

Thus, his diagrams show the form of the free surface at distances which are typically up to, say, ten ship lengths away from the vessel. Mr Cox (Page 32, Column 1, Paragraph 1 and 2) refers to Figure 6 in Raven’s paper, claiming that the so-called 1/3-decay rate has been proven there. It is necessary to note that the data in this figure relates only to a Froude number of 0.3, which would correspond to a speed of 5.15 m/s or 10.0 kn for a vessel of length 30 m. As seen in Figure 5(b) and Figure 6(b), my computer program produces almost the identical decay rate for a monohull at this speed.

The whole thrust of my work is that the decay rate varies strongly with the speed, a characteristic phenomenon which Mr Cox has failed to grasp.

Of course, one could never expect perfect agreement between the (nonlinear) work of Raven and the (linear) work of my own. On the other hand, in the far field, the nonlinear theory will exhibit a linear behaviour, and hence the decay rates displayed by the two theories must be identical. The calculations referred to here confirm this point, as much as can be expected, keeping in mind that the computational domain is much smaller in the work of Raven.

It is also noted that Raven has plotted the “wave range”, a concept that I have used with my colleague, Dr Sandy Day, at The Universities of Glasgow and Strathclyde, in Glasgow. It is therefore quite disturbing to see Mr Cox (Page 30, Column 2, Paragraph 6) criticise the use of this parameter.

A third type of wave-generation program is that based on Havelock singularities. Havelock singularities are ones that automatically satisfy the linearised free-surface. In this way, the considerable numerical development of a program such as Raven’s is obviated. The resulting program is much simpler and is faster to execute. On the other hand, the drawback of a linear program is that, according to the assumptions of the theory, only thin ships can be analysed. Despite this, experience has proven that very close agreement between theory and experiment has been achieved even for vessels with a beam-to-length ratio as high as 0.25. The reader is referred to the work of Sahoo, Doctors and Renilson (1999) for a presentation of such encouraging comparisons.

There is a vast body of literature on the subject of such programs based on linearised theory. Indeed, my own work, and that of my co-worker, Dr Day, is almost exclusively based on this approach. The landmark paper in this field was published by Michell (1898) at Melbourne University.

Hence, when Mr Cox (Page 30, Column 2, Paragraph 5 and 8) criticises my work, he is attributing too much credit to me. He is essentially criticising the complete development of wave-resistance theory over a period of more than a century. Entire international workshops, funded and organised by such bodies as the US Office of Naval Research, are devoted to this subject.

As an example of the linear theory, we show Model 6 in the AMECRC systematic series of fourteen high-speed displacement vessels, described by Bojovic (1995 and 1996). This appears in Figure 2(a).

Predictions of the specific total resistance R_T/W are compared favourably with the experimental data in Figure 2(b). This is the ratio of the total resistance to the weight of the vessel. The data is plotted as a function of the length Froude number F . These calculations verify that the theory and the associated computer software can be used with confidence.

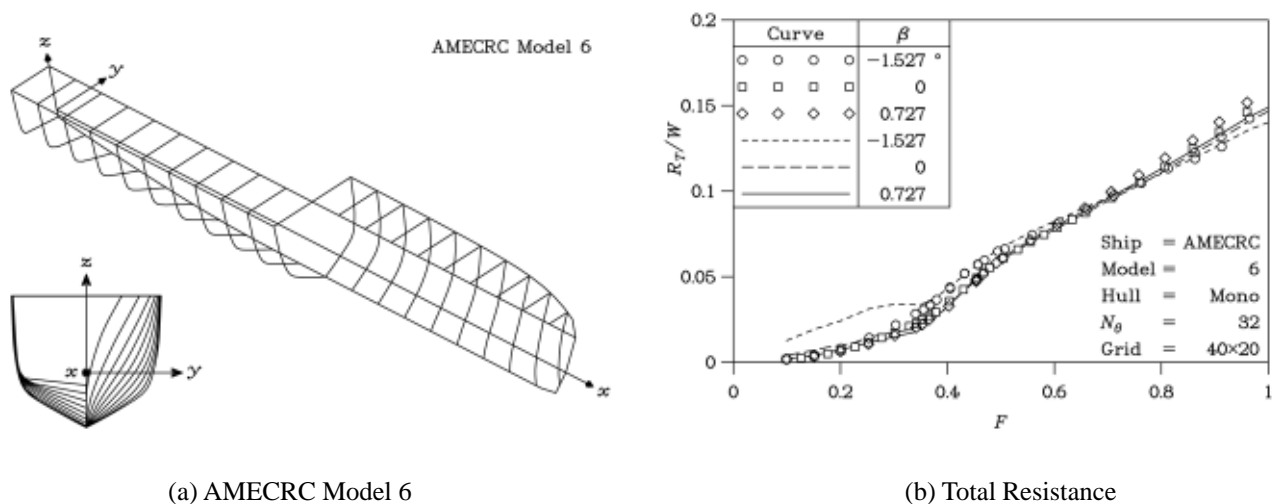


Figure 2: Test of Computer Program

Decay Exponent

We now turn to the specific matter of the wave generation, which is intimately associated with the wave resistance. For this purpose, we refer to the work of Doctors and Day (2001) and Doctors, Phillips and Day (2001). It is presumably these two papers of which Mr Cox is critical.

Longitudinal wave profiles are shown in Figure 3(a) for a scaled-up version of Model 6, with a displacement of 60 t. The data shows the wave profile as a function of the longitudinal coordinate x , which is centred on the vessel at midships. These profiles, or longitudinal cuts, are plotted at different transverse offsets y . Despite what was said by Mr Cox (Page 30, Column 2, Paragraph 5), the program definitely can be run with variable lateral spacing, but there seems to be no practical need to comply with such an odd request.

Figure 3(b) presents corresponding results for a catamaran version of this vessel, in which the individual demihull beam has been chosen to be half that of the monohull, thus maintaining the correct displacement. The demihull centreplane spacing is 10 m; this is one-third of the length of the vessel. The results show a generally lower wave height for the catamaran, thus explaining the popularity of this type of low-wash vessel. Experimental evidence for this statement was presented by Macfarlane and Renilson (2000) in their Figure 5, for example.

The abscissa of these graphs show that there is no difficulty in effecting calculations up to a distance of over one kilometre behind the vessel. In practice, the computer program has been run over distances up to three kilometres downstream and five kilometres laterally, without any numerical difficulties. Such calculations would be impossible using a nonlinear theory.

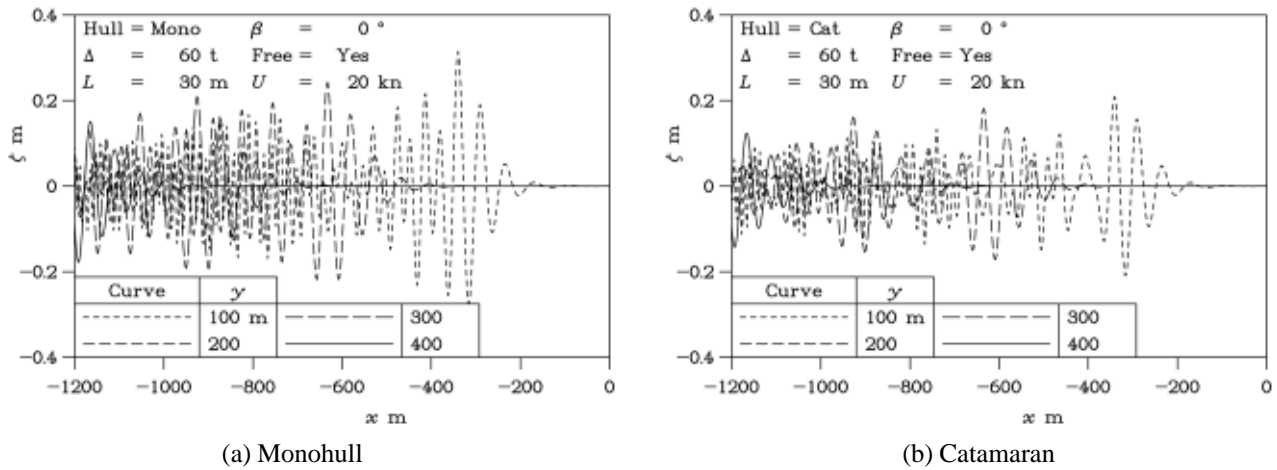


Figure 3: Longitudinal Wave Profiles

Fitted curves of wave decay with respect to the transverse offset y are shown in the two parts of Figure 4. A curve of the form

$$\zeta/\zeta_1 = A(y/y_1)^N$$

has been fitted. Here, ζ is the wave elevation as a function of the offset y and ζ_1 is the value at the first offset y_1 . N is the decay coefficient (always negative) and A is a constant obtained from a best-fit analysis. The simplicity and good behaviour of this approximation is evident. It is also clear that the minimum and maximum wave amplitudes are essentially equal and that the wave range is conveniently the sum of either of these.

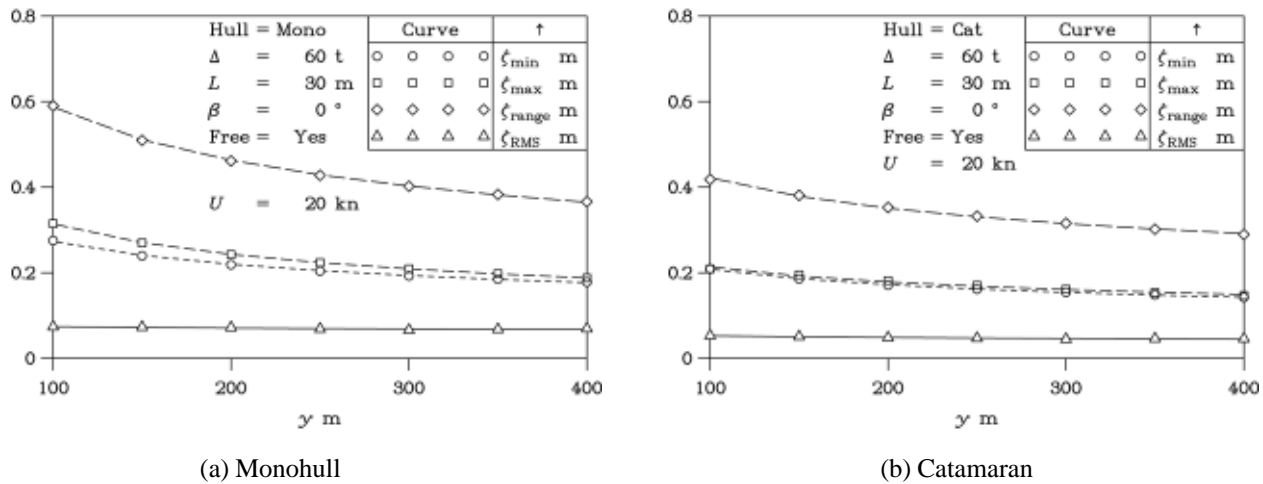


Figure 4: Curves of Wave Decay

Next, we show the corresponding variations of the magnitude of the wave range, and the decay exponent, as a function of the speed. These appear in Figure 5. The influence of initial vessel trim angle β (positive is bow down) is seen to be quite small at high speeds.

One can also observe from Figure 5(b) that the decay exponent varies strongly with the speed. Without doubt, the very large negative value of the exponent in the vicinity of 12.5 kn corresponds to the main hollow in the wave-resistance curve, where far-field wave generation is known to be very low. The decay exponent is seen to approach a figure of 1/2 at high speeds.

The reason for this behaviour is that, at high Froude numbers, the vessel generates mainly divergent waves travelling at an increasingly large angle relative to the track of the vessel. Such waves lie well within the Kelvin angle and therefore exhibit the 1/2-decay rate noted earlier in this paper.

Mr Cox (Page 30, Column 2, Paragraph 5) has misunderstood the purpose of the Wigley hull. It is a concept originally devised to reduce the computational effort involved in wave-resistance prediction. The simple mathematical form is still a very convenient tool that allows researchers to compare their work easily. My program can evaluate realistic hull forms just as easily as mathematical forms, despite the unsubstantiated and gratuitous comments by Mr Cox (Page 31, Column 1, Paragraph 3). It may be added here that, at the recent Twenty-Fourth Symposium on Naval Hydrodynamics, in Fukuoka, Japan, there were six presentations on research that related to calculations on a Wigley hull.

Incidentally, his use of the word “robustness” in the last sentence of this paragraph should surely be replaced by “applicability” or “usefulness”?

By way of comparison, we also present here Figure 6, taken from Doctors and Day (2001). One can compare the decay coefficients for the realistic hull in Figure 5(b) and the Wigley hull in Figure 6(b) and deduce that the details of the hull shape are relatively unimportant at high speeds. Mr Cox (Page 31, Column 1, Paragraph 3) is therefore wrong in his arguments about the use of this simplified hull. I am curious about what Mr Cox means by his claim regarding the “peculiar wave patterns” produced by the Wigley hull.

It is seen in Figure 6(a) that catamarans are generally superior to monohulls because the wave magnitudes are lower. It is also clear that stretched versions of the hulls are superior. Naturally, in order to make the comparison valid, one must adjust the beam, thus preserving the displacement at 60 t.

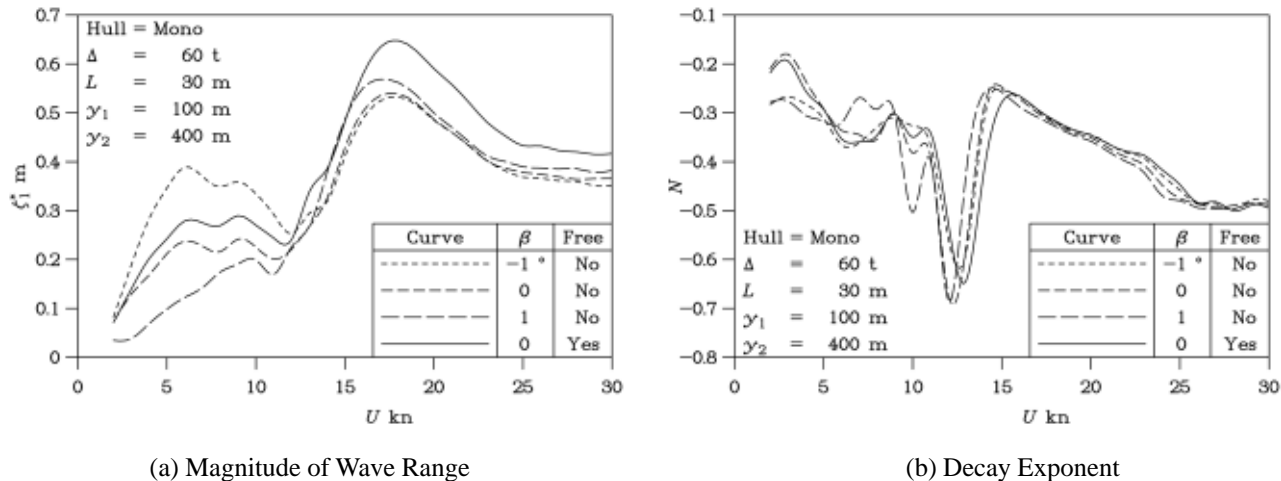


Figure 5: Decay Factors — AMECRC Hull

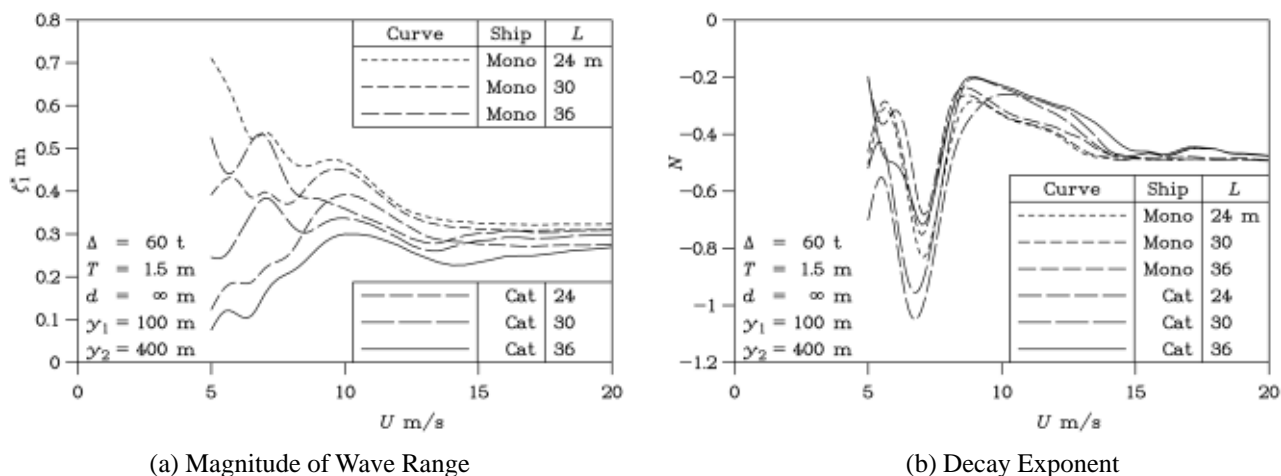


Figure 6: Decay Factors — Wigley Hull

Wave Measures

Mr Cox (Page 30, Column 2, Paragraph 6) expressed his concern about the use of the parameter “wave range” as opposed to “wave height”. He quite correctly pointed out that slight differences in the wave profile can result in a totally different value for the “wave height”, but essentially the same result for the “wave range”. Unfortunately, he then drew the wrong conclusion.

The wave height, usually defined as being the greatest difference between a successive crest and a trough, is an ill-behaved parameter. As a consequence, slight differences in the wave profile can possibly result in a totally different wave height. A slight difference could be caused by errors in measurement, by differences in programming techniques, or by tests on competing candidate vessels which are almost identical. The outcome is that one could wrongly attribute advantages to a particular vessel.

The truth is that neither of these two parameters represents either the wave energy or the damage-causing ability of a wave system. The choice about the right way to characterise wave magnitude is not at all clear and no-one has yet suggested a satisfactory answer to this question. This point alone could be the subject of an entire research program.

In a similar vein, Mr Cox (Page 31, Column 2, Paragraph 5) stated the importance of the wave period. He is correct here. It is well known that the period of the wave system has a strong impact on the erosion of river banks, for example. Unfortunately, wave period (as it is generally defined, using zero crossing points) is just as ill-defined as wave height; and for exactly the same reasons. Thus, Mr Cox (Page 31, Column 1, Paragraph 7) has misunderstood my reasons for not wishing to use wave period, as he would define it.

It is possible to define wave period by other means. One example is to consider the separate Fourier components in the wave system. These components do have a properly-defined period. One might then weight these periods according to their individual wave amplitudes (or, perhaps, the square of their individual wave amplitudes). In this way, one could devise an amplitude-weighted period for the entire wave pattern. I have, in fact, already done this and found reasonable (but not perfect) correlation with tests done on a full-size river catamaran.

It is useful to add here that catamarans are known to generate a wave system with a lower wave height (or wave range) than that of monohulls. It is also true that the wave system typically possesses a greater wave period. The greater wave period probably constitutes a damaging factor for the river shores in most cases. It can be concluded that the relative advantages of catamarans and monohulls is not immediately clear.

Conclusions

The essential purpose of this paper is to clarify the matter of the decay rate. That is, the behaviour of the wave amplitude with respect to lateral distance from the track of the vessel. To be precise, my program computes (in addition to the other parameters) the range of wave elevation on a particular longitudinal cut. I then plot this result as a function of the lateral offset.

It is vital to understand that the much-documented 1/3-decay rate is an outcome of the linear theory described by Wehausen and Laitone (1960) and Stoker (1966), as already noted. Furthermore, this applies only to the wave pattern produced by a point disturbance (Havelock source) in deep water. Most importantly, this decay is applicable only along a ray-line corresponding to the Kelvin angle. This line lies at an angle of 19.47 degrees to the track of the vessel.

In the case of a marine vessel, we can represent the vessel by a distribution of Havelock sources. The wave patterns of all these sources interact, thus causing an even further departure from the 1/3-decay rate; hence, the decay rate clearly depends on the Froude number.

An interesting, and perhaps peculiar, final point is that all calculations of, and experiments on, wave fields must relate to finite (even if large) wave domains. One could try to state, as many persons have, that eventually the waves in the far field should follow the 1/3-decay rate, since there will always be some waves which are generated on the Kelvin line and the 1/3-decay rate is weaker than the 1/2-decay rate. However, the difference between the two decay rates is only 1/6. This implies that for such waves to dominate (say, by a factor of 10), it would be necessary to move to a point which is farther away from the vessel by a factor of 10^6 . If one were to estimate that the initial wave field is established at a lateral offset of 10 m, then the 1/3-decay rate will only be observed at a lateral offset of 10 000 km. Thus, it can be safely concluded that the 1/3-decay rate is very much a hypothetical concept of little value in realistic situations.

Acknowledgments

I would like to thank my colleague Dr Sandy Day, at The Universities of Glasgow and Strathclyde, in Glasgow, for his assistance with the writing of this paper/rebuttal. We have spent considerable time over the last decade working together on wave problems and I have learnt much from him. I would also like to express my appreciation to Dr Hoyte Raven, Maritime Research Institute Netherlands (MARIN), in Wageningen, for his extensive insightful discussions on the matter of wave decay.

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EDUCATION NEWS

Australian Maritime College

Tenix, Williamstown, kindly invited AMC and UNSW to send a number of students and lecturers to visit the shipyard prior to the launch of the eighth Anzac-class frigate *Ballarat*. The visit included an extensive tour of the design office, fabrication sheds and slipway, with the focus of the day being on the launching of the ship and the engineering behind it. The visit concluded with an invitation to attend the launching ceremony the following day. We would like to thank Tenix for this rare opportunity as both students and lecturers found the experience very rewarding. Special thanks also to Samantha Tait for organising the tour.

S. Cook, T. Williams, W. Limpus, J. Duffy and T. Gourlay.

Curtin University

Kim Klaka and Kristoffer Grande of Curtin University each presented papers at the recent YachtVision '02 conference in Auckland. Kristoffer, a Masters student at the Centre for Marine Science and Technology, also won second place in the design competition, ahead of many professional designers. He has just returned from Norway where he presented a paper *Prediction of Slamming Occurrence on Catamaran Cross-structures* at the 21st International Conference on Offshore Mechanics and Arctic Engineering.

Jinzhu Xia presented a paper *Some Insight into the Green Function of the Channel Problem* at the 17th International Workshop on Water Waves and Floating Bodies, Cambridge, UK. Jinzhu has recently been appointed to the Editorial Committee for the Journal of Ship Mechanics.

Dr Tim Gourlay leaves the Australian Maritime College in December to take up a position as Research Fellow with the Centre for Marine Science and Technology at Curtin University.

Kim Klaka

The University of New South Wales

Undergraduate News

Sydney Heritage Fleet provided access to their steam yacht *Lady Hopetoun* for the third-year students to conduct an inclining experiment at Rozelle Bay on 15 May. The students conducted the experiment with the guidance of lecturer Mr Phil Helmore. The day was almost perfect for an inclining, but sprinkled rain for some of the time. The experiment was continued, as it was more important for the students to complete the experiment than to obtain a perfect set of results, and the students made a good job of their first inclining. The theory of stability is fascinating, but seeing it in practice at an inclining makes it come *to life* for the students.

The Naval Architecture Program hosted a visit from the Department of Defence in Canberra on 16 May. A presentation was made by Mr Roger Duffield, Director General Navy Systems and Ms Karen Sommer, Executive Assistant Professional Development (Navy). The principal purpose of the visit was to assist the Department of Defence with their recruiting drive.

It appears that there is now a special need to rebuild the strength of the Department with respect to their complement of professional naval architecture staff. This is, naturally, good news to the large fourth-year group of UNSW students, which expects to complete its studies at the end of 2002. Our students have always enjoyed finding rapid and suitable professional employment upon graduation; however, the availability of an additional employer is most welcome.

After the presentation, our visitors entertained a question-and-answer session. The questions that were presented covered technical aspects of the employment, in terms of the actual duties to be performed. Additionally, other matters such as the location of the employment and the question of promotion and posting overseas were also covered. The meeting concluded with an informal luncheon provided by the School.

The Anzac Ship Project Management Office was once more

a generous host to our final-year students, accompanied by lecturer Mr Phil Helmore, and to the AMC final-year students accompanied by Dr Tim Gourlay and Mr Jonathan Duffy. This enabled them to see the launching of the eighth Anzac-class frigate, HMAS *Ballarat*, at Tenix Defence Systems' construction facility at Williamstown. On Friday, 24 May, the day before the launching, Hull Systems Engineer, Ms Sam Tait, welcomed students from UNSW and AMC to the yard and made the Introduction to Safety presentation. She then invited Ship Engineering Manager, Mr Peter Goodin, to give a presentation on the launching drawings, arrangements and calculations. Tenix's Dockmaster, Mr Sean Johnston, with Mr Goodin and Ms Tait then led them on a tour of inspection of the ways where preparations for launching were in progress. After lunch, Mr Goodin and Ms Tait made a joint presentation on the construction, contract, logistics and other details. Ms Tait and Mr Graham Charlesworth then led them on a tour of the Tenix construction facility with vessels in various stages of completion, from cutting plate through to modules for Anzac 09 waiting to go onto the building berth, the dry dock and the transporters.

The launch lady for HMAS *Ballarat*, on Saturday 25 May, was Dr Susanna Herd, a lecturer in biochemistry at La Trobe University, Ballarat. Her father, Robert Herd, served on the Bathurst-class minesweeping corvette HMAS *Ballarat* from 11 November 1942 until 20 July 1943. He remained in contact with many of his shipmates and has been a longtime President and Treasurer of the HMAS *Ballarat* Association (Victoria). He is well-known to naval architects as a former longtime member of Council and onetime President of the Australian Division of RINA.

Visiting dignitaries included the Chief of Navy, the Treasurer, the Premier of Victoria, and the Mayor of Ballarat. The official party was accompanied by the Friends of Sovereign Hill Redcoats, music was provided by the Ballarat Municipal Brass Band and the Royal Australian Navy Band (Melbourne). The Ballarat and Clarendon Junior High School Choir (known as "High Notes") sang the catchy *Ballaarat* (sic). When Ballarat was founded, it was known as "Ballaarat", deriving from two Aboriginal words, "balla" meaning resting, and "arat" meaning place). The formation flypast was by heritage aircraft from the RAAF Museum at Point Cook. A number of officers and crew of the first HMAS *Ballarat*, as well as many people from Ballarat, were there for the occasion.

The launching of HMAS *Ballarat* was textbook-smooth and a credit to all concerned. UNSW would like to thank Mr Richard Hallett for making the visit possible, and Mr Peter Goodin, Ms Sam Tait, Mr Sean Johnston, and Mr Graham Charlesworth for their parts in making our visit interesting, informative and entertaining.

One of the interesting undergraduate thesis topics this year is an investigation by Katie Miller of *John Oxley* as a contribution to the restoration by the Sydney Heritage Fleet. Katie is concentrating initially on the intact stability and flooding, loadline and structure of the vessel in order to be able to meet the survey requirements of the Waterways Authority for the proposed operations. One of the aims is a limiting *KG* curve for the vessel over the range of operational drafts. There is, as yet, no lines plan for the vessel, and Katie

The Australian Naval Architect



The UNSW visitors sampling local Williamstown hospitality
(Photograph courtesy Hason Ho)

is working from a docking plan, drawn to a *trimmed* waterline for docking, which provides an extra challenge. A video of the vessel taken when she was docked on the pontoon at ADI has provided evidence for the drafts at that time, and estimates of the subsequent changes will provide a new lightship as a basis for the proposed operating conditions.

Post-graduate and Other News

The Symposium on Naval Hydrodynamics conference is run under the auspices of the Office of Naval Research (ONR) in Washington and takes place every two years. The twenty-fourth symposium was held in Fukuoka, Japan, on July 8–13, 2002, with the now-standard five-day format being used. In addition to the ONR, The National Academy of Sciences (Washington) and the West Japan Society of Naval Architects were co-sponsors. The local organising committee consisted of a number of academics from the Department of Naval Architecture and Marine Systems Engineering, at Kyushu University in Fukuoka.

A total of 68 papers on all aspects of ship hydrodynamics was presented. There were 137 attendees from 17 countries. On this occasion, there were two Australian contributions.

Professor Ernie Tuck, Dr D.C. Scullen and Dr L. Lazauskas of the University of Adelaide presented a keynote lecture on the subject, *Wave Patterns and Minimum Wave Resistance for High-speed Surface Vessels*. The results were relevant to vessels which are optimised for minimum drag and data was shown that pertained to well-designed monohulls, multihulls, hovercraft and planing surfaces.

Professor Lawry Doctors and Dr Sandy Day discussed their work on *Nonlinear Free-surface Effects on the Resistance and Squat of High-speed Vessels with a Transom Stern*. Here, the emphasis of the research was to study various nonlinear free-surface effects on the resistance, sinkage and trim of the vessel. It was demonstrated that excellent agreement could be obtained between the theory and the experimental towing-tank data.

After the ONR conference, Professor Doctors had the opportunity of visiting a number of companies in the Southampton area of England. In particular, he visited QinetiQ, at Haslar Marine Technology Park in Gosport, where he discussed collaborative research on multihull vessels. He also presented a well-attended seminar on *Steady-State Hydrodynamics of a Vessel with a Transom Stern*.

Phil Helmore
Lawry Doctors

INDUSTRY NEWS

Wärtsilä generators for Thunder Horse offshore project

Wärtsilä has been awarded a contract from BP to deliver an integrated package of auxiliary diesel generators totalling 15.3 MW for the Thunder Horse offshore project in the Gulf of Mexico. The power plant will be installed on the production, drilling and quarters platform *Thunder Horse PDQ* being built in Korea.

The integrated package of auxiliary diesel generators is to supply the hull and drilling rig loads, the emergency services, and the fire pumps, with control systems for all three services. The auxiliary diesel generators are powered by two Wärtsilä 18V26 engines, each rated 5580 kW at 900 rpm. The emergency generator has a Wärtsilä 12V200 engine, rated 2100 kW at 1200 rpm. Two Wärtsilä 6L20 generating sets, rated 1020 kW at 900 rpm, provide independent power for the emergency fire pumps.

The Thunder Horse field is the largest oil and gas discovery to date in the Gulf of Mexico. It is located approximately 150 miles south-east of New Orleans, Louisiana. The field will be developed by BP, with ExxonMobil owning a 25% interest in the field development. BP will act as the field operator. The hydrocarbons from this field will be produced using the *Thunder Horse PDQ* platform. Displacing 129 000 t, this will be the largest semi-submersible production platform in the world. It will be delivered from Korea in 2004.

The Wärtsilä engines are critical to the progress of the project as they will provide essential power for all hull and drilling rig related services, allowing the platform to be

commissioned before it leaves the shipyard in Korea. Once the platform arrives at the US Gulf coast, the Wärtsilä engines will provide onboard power while the topside process modules are integrated with the platform hull and for commissioning of the topside systems.

The criteria applied by BP in selecting its key suppliers for this project included dedication to continuous improvement, commitment to excellence and a proven record of achievement regarding health, safety, the environment and technological innovation. Wärtsilä benchmarked best in its sector.

The BP Thunder Horse order marks a milestone for Wärtsilä's offshore business as the first Gulf of Mexico production unit project. Wärtsilä has experience from floating production unit applications in the North Sea, Brazil, China and Africa, and are excited to move into this segment in the Gulf of Mexico as well.

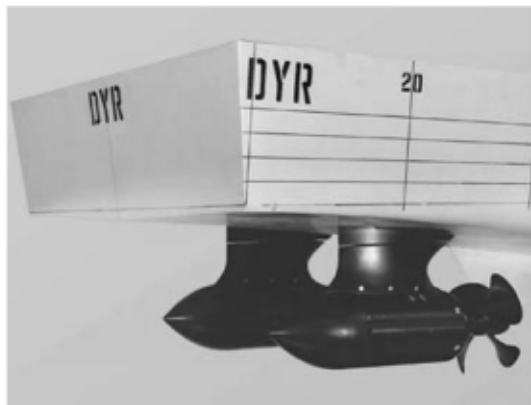
Revolution Design in Business

Following a re-structure of staff at Incat in Tasmania, the design team is now offering their services to the industry as Revolution Design Pty Limited under the leadership of managing director Mark Dewey.

Revolution Design has expanded the team's services to include aluminium high-speed vessel and wave-piercing catamaran designs, marine design and draughting, concept design and route feasibility analysis and design audit services for lightweight structures, marine designs and transport systems.

More details are available at www.revolutiondesign.com.au.

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Wärtsilä Power for Husky Oil FPSO

Wärtsilä has been awarded a contract from Samsung Heavy Industries Co Ltd, South Korea, for a complete ship propulsion and auxiliary power plant for a 133 000 tdw FPSO (floating oil production, storage and offloading) vessel being built for Husky Oil Operations Ltd of Canada.

The propulsion plant comprises two Wärtsilä 8L46 diesel engines each driving a Lips controllable-pitch propeller of 5.5 m diameter through a Wärtsilä gearbox. The main engines have a combined power output of 15 600 kW at 500 rpm. There are two Wärtsilä 6R32 auxiliary engines, each of 2 430 kW at 720 rpm, for generating sets on board the FPSO.

The FPSO vessel is 272 m long by 46 m beam and 27 m deep, with a storage capacity of 940 000 barrels of crude

oil. It is designed for a maximum production rate of 120,000 barrels of crude oil per day. It will operate on the White Rose field located about 350 km off the east coast of Newfoundland, Canada, from the second quarter of 2005.

The FPSO vessel will operate in a harsh, iceberg-prone environment. The propulsion plant enables the vessel to be self-propelled for the delivery voyage, and to be able to navigate if the vessel is released from its mooring in the case of a threat of iceberg collision.

The White Rose field is estimated to have reserves of 250 million barrels of oil. It is being developed by Husky Oil Operations Ltd, a member of Husky Energy Inc., one of Canada's largest gas and oil companies in terms of production and reserves.



HMAS *Sheean* on the surface during the recent Rimpac 2002 multi-national naval exercise
(US Navy Photograph)

THE INTERNET

Report on Bass Strait Ferries

The Tasmanian Government has put up on their Transport web site www.transport.tas.gov.au a document detailing their decision to buy two monohull ferries for Bass Strait in lieu of fast catamarans. The decision was not taken lightly, and the document details the thinking behind the decision, design considerations, seakeeping and financial aspects.

Details of Bass Strait Ferries

If you are interested in the new Bass Strait ferries themselves, or anything to do with them, then you can find it all out on TT-Lines' website, www.tt-line.com.au. The details of the ferries, *Spirit of Tasmania I* and *II*, include principal particulars, accommodation, vehicles, sailing schedule, fares, on-board facilities, freight, etc.. The new service is scheduled to commence on 1 September.

Twin Disc's New Quickshift™ Marine Transmission

Twin Disc recently announced the unveiling of a new line of marine transmissions designed to optimize precision boat-handling while eliminating the low-speed limitations of conventional marine transmissions. "Twin Disc's patent pending QuickShift transmission will change the industry's expectations of how a marine transmission should perform," said John Batten, the Marine Division's Vice President and General Manager. Using a proprietary shifting technology, the new transmission instantly applies power to the driveline at low torque when shifting from neutral to full ahead or full reverse. It senses the amount of power applied and the corresponding torque resistance, then cushions driveline shock and optimizes the power to the driveshaft to overcome resistance within milliseconds. This results in a steep but

smooth power curve and less wear-and-tear on the engine and drivetrain, creating a competitive advantage for boat manufacturers beyond what is currently available in the marketplace.

The QuickShift also offers fishing vessels a distinct advantage for net operations, docking and other low-speed manoeuvres. According to Klaus Meyersieck, Product Manager, "Until now, large diesel-powered boats could not effectively maintain vessel control below five knots without the threat of stalling. The QuickShift transmission's unique ability to regulate engine torque at extremely low speeds allows boat operators to slow propeller speed to 50 rpm or less, affording controllable maneuvering at slower speeds than even conventional trolling-type transmissions."

Twin Disc initially will offer three models of the QuickShift transmission as well as an Express™ upgrade incorporating Twin Disc EC-251 electronic controls, which are designed to give the operator infinite propeller speed and directional control with a touch of the control lever.

Further details can be found on the website www.twindisc.com/wwwauto/tdwn_npr.html.

Fisher Maritime

The name of Fisher Maritime is familiar to most members for their work and seminars in the field of construction management, contracts, technical analysis, expert witness and arbitration. However, the company has a new website which expands and updates the previous site. Details of the services provided, recent assignments, and professional reading material (books, downloadable papers and Fisher Maritime newsletters) are all there. Visit www.fisher-maritime.com.

In a safe haven at last, well attended by her salvors and harbour tugs, the damaged destroyer HMS *Nottingham* in Newcastle harbour on 9 August after tow from Lord Howe Island
(Photograph John Jeremy)



Trading Fishing Quotas

The Australian fishing industry recently had a new online trading service established for fishing licences, quota and boats. This online service allows fishermen to trade permits, quotas and statutory fishing, thereby staying in control of the licence trading process. Here they can place buy, sell, or wanted advertisements for free, 24 hours a day, and be sure it will reach the right market. Visit www.quotatrader.net, or email Robert Fish at rfish.quotatrader.net for further information.

ProSurf 3

Are you on the lookout for low-cost hull design and fairing software? ProSurf 3 is available for \$US795. Go to the web site www.newavesys.com/sname.htm to download the full, working demo, study the tutorials and the technical articles and see their example customer list. *The ANA* would be interested in publishable feedback.

MIT Courses to be Available On-line

At a press conference on 4 April 2001, Massachusetts Institute of Technology announced its commitment to make the materials from virtually all of its courses freely available on the World Wide Web for non-commercial use. This new initiative, called MIT OpenCourseWare (OCW), reflects MIT's institutional commitment to disseminate knowledge across the globe. For further information about this initiative, visit <http://web.mit.edu/ocw/ocwfactsheet.html>.

Phil Helmore

FROM THE CROWS NEST

Bringing Back the Engineers

A recent report by Athol Yates in *Engineers Australia* (May 2002) says, in part:

The 1990s was the decade of reengineering and deengineering government departments. Under strategies like outsourcing, many government agencies substantially reduced their in-house engineering workforce. It was expected that this would deliver lower costs, improved quality and increased flexibility.

The actual consequences of these changes are documented in a recent report on the Department of Main Roads Western Australia (MRWA). Given that MRWA was a leader in the speed, scale and extent of outsourcing road activities, the report's findings will provide an insight into the problems other agencies around the country are only now recognising.

The net result of outsourcing in MRWA was a reduction of about 30% in engineering and technical staff between 1995 and 2002. Significant parts of industry now regard MRWA as an uninformed purchaser, and much experience lies with few personnel, and without backup. There are limited opportunities for careers in technical areas, and engineers complain of low job satisfaction.

The report strikes chords in a number of areas of naval architecture, not least in the state survey of commercial vessels, and the Department of Defence.

Several state survey authorities downsized their naval architecture staff in the 1990s, but have recently employed new staff with expertise in this area.

The Department of Defence also downsized in the 1980s and 1990s, and is now realising that a significant part of their experience is tied up in some forthcoming retirements of naval architects. Without replacements, they will end up

in a similar situation to MRWA when purchasing ships. They have therefore begun a campaign to recruit naval architects to the fold. To do that, they have to make it attractive, by way of career prospects, travel, industry placements, etc. It can be done, but it cannot be done overnight.

What the bean-counters forgot, when enumerating the benefits of down sizing, was to put a value on experience and on loyalty. When you lose them, they become extremely valuable!

Lars and Harold Halvorsen Collection Donated to ANMM

The name of Halvorsen has been synonymous with boatbuilding in Australia since 1924, when Lars Halvorsen arrived with his family and set up the family business, Lars Halvorsen and Sons. Son Harold led the business after his father's death in 1936 right up till last year.

The Halvorsen name evokes visions of classic timber cruisers, hire launches, luxury vessels and ocean racing yachts. Halvorsen-built vessels include *Gretel* (Australia's first challenger for the America's Cup), *Peer Gynt*, *Anitra* to *Anitra V*, *Solveig* and *Freya* (famous Sydney-Hobart yachts designed, built and sailed by Halvorsens), workboats, tugs and fishing vessels; more than 1200 in all.

On Sunday 19 May, Lars and Harold Halvorsen's lifetime collection of drawings, photographs, and boatbuilding tools was donated to the Australian National Maritime Museum by Harvey Halvorsen, son of Harold. Guests of honour were Harold's brothers Carl and Trygve Halvorsen. The formal presentation at the ANMM was preceded by a sail past of classic Halvorsen motor yachts, courtesy of the Halvorsen Owners Club.

Phil Helmore

PROFESSIONAL NOTES

NMSC Safety Equipment Section for Comment

The National Marine Safety Committee (NMSC) has released Part C Section 7A, Safety Equipment, of the new National Standard for Commercial Vessels (NSCV) and its Regulatory Impact Statement for public comment. Part C Subsection 7A replaces Section 10 and part of Section 13 of the Uniform Shipping Laws Code.

This section of the NSCV specifies the requirements for the design and manufacture of safety equipment, and for the installation, stowage, labelling, and use of the equipment. The equipment covered includes survival craft such as liferafts, dinghies and rescue boats, evacuation systems, lifejackets, flares, EPIRBs, immersion suits and medical supplies.

Communication, navigation and deck equipment will be covered in other subsections of Part C Section 7.

Copies of the Draft Standard, Regulatory Impact Statement

and Comment Forms are available for download on the website www.nmsc.gov.au, or in hard copy from the secretariat on (02) 9555 2879. Submissions on Part C Subsection 7A will be accepted until 30 September 2002.

Other NSCV Progress

The Australian Transport Council (ATC) is expected to intercessionally approve major elements of the National Standard for Commercial Vessels (NSCV) in the near future.

The ATC, comprising all Australian transport ministers, was to have considered approvals for the sections at its first meeting this year but as this has been delayed until August, NMSC has sought intercessional approval, which is expected within weeks. The ATC has already endorsed the framework for the National Compliance Plate (NCP) program for Australia's new recreational boating safety system.

The expected NSCV approvals, together with the NCP, lay the basis for the introduction of Australia's new nationally-

consistent commercial and recreational boating safety codes. NSCV elements submitted for intercessional ATC approval include:

- Part A — Safety Obligations
- Part B — General Requirements
- Part C — Engineering (including four subsections)
- Part D — Crew Competencies
- Part F Subsection 1A — Fast Craft, general requirements
- Part F Subsection 1B — Category F1 Fast Craft

The ATC's decision will mean that major planks of the new commercial standard, covering occupational health and safety, crew training and qualifications, fast craft and engineering requirements can be passed into law. They will be progressively implemented through legislation in state and territory parliaments.

Information Kit on New Standards

NMSC is developing an information kit to explain the new standards (NSCV and NCP) and ensure public awareness and understanding prior to their introduction. The kit is in addition to information regularly supplied to stakeholders

through the NMSC's communications program. It has been designed for use by media outlets and stakeholder groups interested in marine safety and will be available electronically or in hard copy through the NMSC secretariat.

NMSC at its June meeting confirmed its policy of issuing information about national marine safety programs being developed and work in progress and decided that jurisdictions would issue releases on matters such as legislation being enacted by the parliament in their state or territory.

NMSC's public information procedures have been designed to satisfy Council of Australian Governments and Office of Regulation Review requirements.

Maritime Safety Queensland

Queensland Transport Minister, Mr Steve Bredhauer, has introduced legislation into the State Parliament to establish Maritime Safety Queensland, the reorganised maritime authority to boost safety and pollution prevention.

Maritime Safety Queensland will streamline the provision of essential maritime services, taking over administration of pilotage and pollution response from local port authorities. *Safety Lines*, July 2002

Professional Indemnity Insurance — Is it Your Problem?

I've heard from many members recently about difficulties in obtaining professional indemnity (PI) insurance cover. In some cases insurers have simply withdrawn from the field leaving people high and dry while, in others, insurers have imposed onerous and/or unacceptable conditions. This has resulted in serious difficulties for some people who have found themselves not covered. Others have either missed out on contracts because their insurance conditions don't extend to cover particular types of work, or they have found their costs increased dramatically — premium increases of 300% are not unknown.

To answer the obvious question of "Do I need professional indemnity insurance?" I refer you to an Association of Professional Engineers, Scientists and Managers of Australia web page http://www.apesma.asn.au/services/insurance/professional_indemnity_insurance.htm. Two extracts from that web page are:

Appropriate PI Insurance indemnifies insured persons against damages awarded against them by a Court, or resulting from an approved negotiated settlement, in relation to an act, error or omission in the conduct of their business which breached the professional duty of care owed. It also covers the costs and expenses of defending claims of negligence on their part or the part of a party acting on their behalf.

and

An increasing number of legal actions brought against the professional include, as an alternate "pleading", allegations that the professional misled, or deceived the aggrieved party. Because allegations of this nature do not actually claim negligence as the cause of loss, any resulting award for damages made against the insured professional may not be covered by a standard

professional indemnity insurance policy. It is essential that your PI Insurance contains this cover.

Travelling without PI cover exposes not only the person concerned but also his family and all his possessions. Naval architects often find themselves working on high-value products, or in areas where down time is very expensive. The potential for multi-million dollar claims is very real and those working as consultants or contractors are not protected by company structures or employer liability. Ultimately, any damages will have to be met by the individual, who may find him or herself having to sell most of his or her assets, including the family home, to meet them. You can, literally, be sent broke!

To address this issue negotiations are being conducted with a broker to try to set up a PI scheme for RINA members in Australia. These negotiations are continuing and one of the key issues is that of the likely number people who would join such a scheme.

So the question is: If the Division sets up a professional indemnity insurance scheme especially to suit the needs of naval architects and on commercially-competitive terms do you anticipate that you would use it?

Please give me your replies as soon as possible, either by e-mail navarch@ozemail.com.au, fax (03) 9857 7697 or mail to PO Box 332, North Balwyn, Vic 3104. If you respond by e-mail please make your message subject "PI Insurance". Only identifiable responses will be accepted and please keep them brief. If you have already given me a reply to this question then you need not do so again. If you want to tell me more about your specific PI insurance problems or concerns then please do that in a separate communication.

Bryan Chapman

By Design Group (BDG) Marine *Spitfire* 12 Sailing Hydrofoil Catamaran

A stylish new sailing hydrofoil catamaran has been designed and constructed in Western Australia in recent months. The hydrofoil takes its name *Spitfire* from the legendary Supermarine fighter aircraft of World War II vintage.

Designed by aeronautical engineer Mark Pivac, manager of BDG Marine, and constructed by Windrush Yachts in Perth, this impressive 12 m long craft was assembled at the Fremantle Sailing Club on 16–17 January and launched on 18 January 2002.

BDG Marine is a division of By Design Group Pty Ltd (BDG), which undertakes a diversity of industrial design work while Windrush Yachts have built thousands of Windrush 14 sailing catamarans over a number of decades.

Design Overview

The origins of *Spitfire* can be traced back to a set of hydrofoils designed by Mark Pivac for an International Moth class dingy owned by Brett Burvill, manager of Windrush Yachts. The Moth *Windrush* sailed with considerable success at the International Moth World Championships held in Perth in 2000, winning two heats in the event. The experience gained with *Windrush* spurred the collaboration on design and construction of the significantly larger hydrofoil-supported *Spitfire*.

Spitfire is of catamaran configuration with a pair of aerodynamic crossbeams connecting the widely-spaced hulls. These also support a raised cockpit and storage area on the centreline of the craft. Three retractable hydrofoils are fitted, comprising a pair of surface-piercing units outboard of the

demi-hulls and somewhat forward of the centre of gravity, and a combined rudder and fully-submerged hydrofoil mounted in an inverted 'T' configuration on the centreline aft. Twin masts mounted on the demi-hulls support a pair of 'soft wing' sails. The overall configuration is somewhat similar to that employed on the French sailing hydrofoil *Techniques Avancees*, though that craft has its main foils mounted inboard of the demi-hulls.

Spitfire's Performance

Mathematical modelling of *Spitfire's* performance was undertaken at BDG well before construction had begun. Some sailing performance predictions for *Spitfire* are provided in Figures 1 and 2. Figure 1 indicates that maximum boat speed is achieved while reaching at about 110 degrees to the true wind. For this heading, a speed of around 32 kn was predicted for 15 kn of wind.

Although still undergoing trials, *Spitfire* is approaching its performance estimates. Take off to foil-borne operation occurs at around 10 to 12 kn, which can be achieved in 10 kn of wind. Once on the foils, *Spitfire* will accelerate to approximately 25 kn in 14 kn of wind. In only its third outing off the coast of Perth on 2 February this year, the hydrofoil catamaran lifted its top speed to 30 kn, on a day with only 18–25 kn winds.

Mark Pivac expects *Spitfire* to reach a maximum speed (without ballast) of approximately 35 kn in 25 kn of wind or less. With water ballast tanks fitted, the estimated top speed is above 40 knots as indicated in Figure 2.

General arrangement of *Spitfire* (Image courtesy BDG Marine)

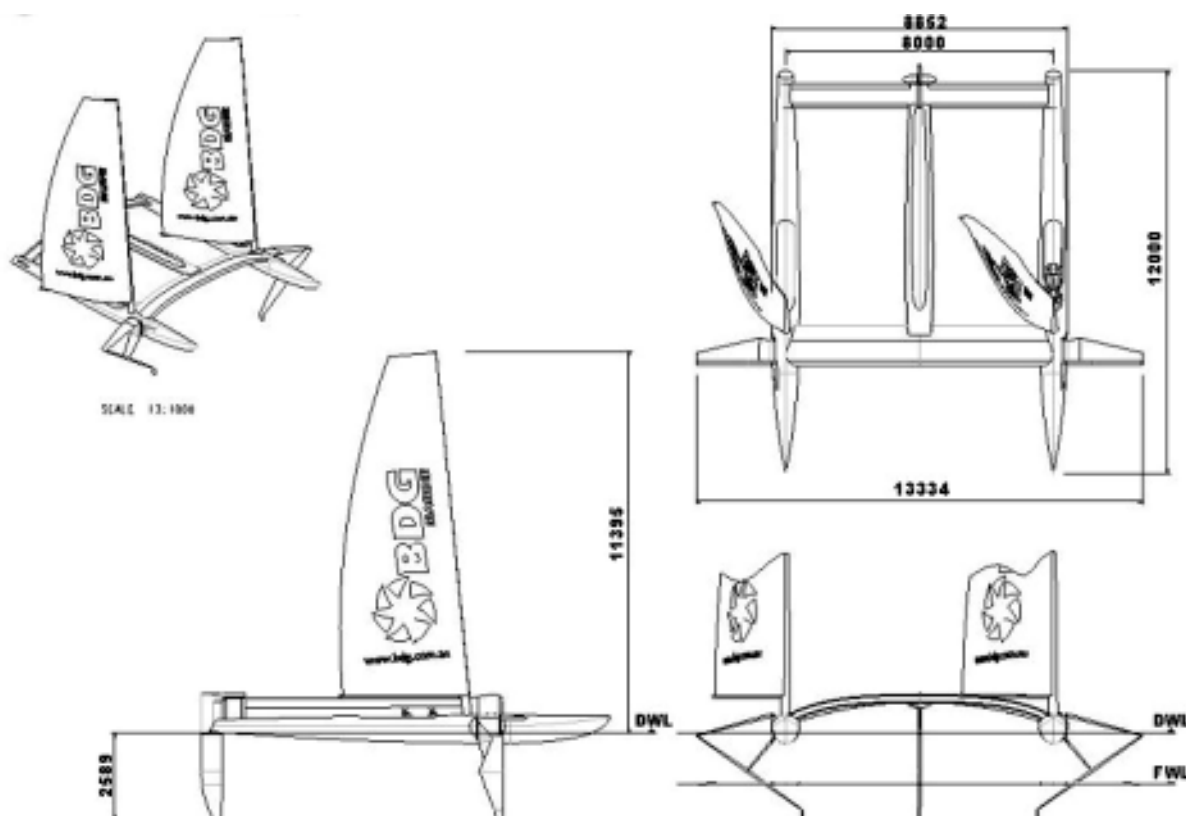




Figure 1

Hydrofoils

As with other hydrofoil sailing vessels, the use of hydrofoils is considered to be the key to *Spitfire's* performance. Once the hulls are out of the water, drag is considerably reduced allowing the boat to accelerate to a much higher speed than would otherwise be possible in the same conditions without foils.

The three hydrofoils are placed in such a way that the two main foils support most of the weight of the boat, and the rear foil mainly provides balance and trim adjustment.

Surface-piercing main foils are used as they offer several advantages. Firstly, as the boat's speed increases, more lift is generated on the submerged portions of the foils and this, in turn, causes the foils to lift themselves and the boat further out of the water, thus maintaining equilibrium between the weight and lift forces on the boat. This leaves less drag-producing foil surface area in the water, which is perfect for good performance. Secondly, the foils are inherently stable. If the boat rides too high, there will be less foil area in the water and hence less lift generated and the boat's weight will force it back down. Conversely, if the boat is riding too low, the additional submerged foil area will generate more lift and raise the boat.

The hydrofoil profiles used on *Spitfire* were developed at BDG Marine. Fluid dynamic modelling software was used to design and analyse the critically-important foil shapes. The hydrofoils were optimised for minimum drag, but with good resistance to ventilation and cavitation. No fences were used on the hydrofoils, and to date there has been no ventilation or cavitation observed.

The foils, rudder skins and shear webs are predominantly constructed of unidirectional and double-bias carbon fibre prepreg. The shear webs were formed over foam and plywood and are bonded between the two skins.

Spitfire's foils can be retracted to enable shallow water operation and beaching.

Hull Structure

The maximum speed of any sailing boat is limited by its ability to remain upright against the side force generated on the sails. The higher the wind speed and the faster the boat travels, the more severe this side force becomes relative to the propelling force. As a consequence, the centrelines of *Spitfire's* demihulls are located 8 m apart, giving the boat

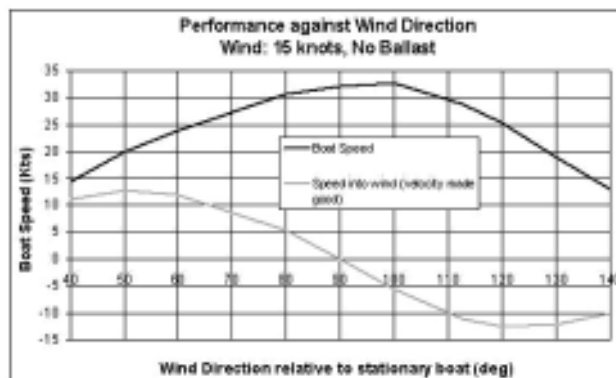


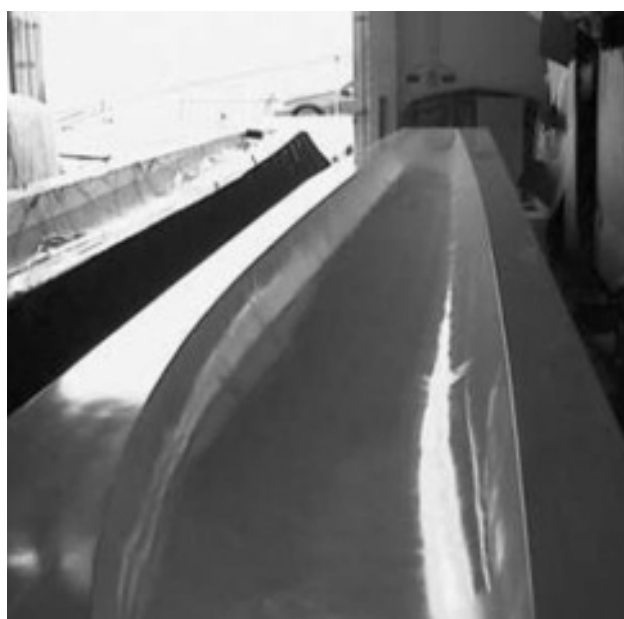
Figure 2

excellent heeling stability both on and off the foils. Through mathematical modelling, BDG predict that with 500 kg of ballast and crew, a maximum foil borne speed greater than 45 kn should be reached before *Spitfire* heels excessively.

In order to meet Australian Yachting Federation (AYF) regulations, the cockpit floor had to be at least 240 mm above the waterline. The cockpit was therefore positioned well above the waterline, in a central 'pod'. This pod also has covered storage space aft. The position of the cockpit, with a floor level around 2.5 m above water level when foiling and with no forward obstructions such as masts, provides the pilot with a clear view of the water ahead, while the location also remains relatively dry. During sea-trials, this has become the most popular area for the crew to sit! Despite travelling at high speed the ride is reported by the crew to be smooth and quiet, even in relatively choppy 1.2 m seas.

The demi-hulls are of GRP sandwich construction with low-density balsa core and E-glass skins. Bulkheads are of 50 mm PVC foam core, with a combination of glass and carbon fibre skins. For each of the demi-hulls, the two hull halves were constructed in a mould and then glassed together. The laminate was wet out with vinyl ester resin using a vacuum bag infusion process, allowing this task to be completed in less than an hour for each hull half.

The hull mould for *Spitfire*
(Photo courtesy BDG Marine)



The crossbeam are built up with low-density polystyrene foam formers and finished with carbon fibre skins and internal webs. Stainless steel pins connect the crossbeams to the hull bulkheads.

Aerodynamic Design

Apart from reducing hydrodynamic drag, attention has also been paid to minimising the aerodynamic drag. Hence, the cross- beams are aerofoil shaped, the number of cables in the airstream has been minimised, and the hulls have been kept streamlined and uncluttered wherever possible. There is an added benefit to giving the cross-beams an aerofoil shape: the front beam produces some lift, which in turn lowers the loading on the hydrofoils and hence their drag. This translated to a little extra speed.



Spitfire's foil raised out of the water
(Photo courtesy BDG Marine)

'Soft Wing' Sails and Twin Free Standing Masts

BDG Marine, in conjunction with Windrush Yachts developed a double-sided sail for *Spitfire*. These sails have been provisionally patented. The design aim was to provide maximum forward force with the available sail area, while minimising the heeling moment on the boat. To achieve this, as well as the wide hull and foil spacing the design employs twin sails, giving *Spitfire* significant sail area while keeping the sail's centre of pressure as low as possible.

The sail system comprises a pair of masts of circular cross-section with the double surfaced fully-battened sails formed around the masts to create a streamlined aerofoil shape with a round leading edge. The flexible battens help to provide the required camber in the sails for an efficient aerodynamic shape with good lift-to-drag ratio.

The boat has been found to tack easily while hull borne, and Mark advises that it has almost been possible to tack while remaining foil borne. He feels the crew will master this eventually.

The masts were designed to be unstayed, thus eliminating the drag associated with rigging. They are constructed from carbon fibre, formed over a stainless steel sheet-metal mould. Despite their length of 12 m, they weigh only 45 kg each.

Plans for the Future

Following the completion of the first *Spitfire*, BDG is prepared to take more orders for the design. Price is anticipated to start at about \$US199 000.



Spitfire underway at speed
(Photo courtesy BDG Marine)

Spitfire's crew is planning an attempt on the 24-hour sailing speed record set by Steve Fossett with the catamaran *PlayStation* in 2001.

BDG Marine also has plans for a larger, 24 to 36 m version of the *Spitfire*, which could be capable of breaking long-distance ocean-racing records such as the transatlantic record currently also held by *PlayStation*. Such a craft may also be a candidate for competing in The Race 2004. BDG is seeking sponsors for this project to proceed.

Further Information

This article is largely based on information provided on the BDG Marine website, with thanks to Mark Pivac. For further information and illustrations of *Spitfire* or other projects of BDG Marine, visit their website at www.bdg.com.au or contact Mark Pivac, BDG Marine, PO Box 377, Welshpool DC, WA 6986, tel (08) 9258 7700, fax (08) 9258 7711 or email mail@bdg.com.

Martin Grimm

Spitfire sailing on foils
(Photo courtesy BDG Marine)



CERTIFICATE OF RECOGNITION FOR CHARLES SPARROW

The Royal Institution of Naval Architects has presented a certificate to Charles Sparrow OAM FRINA in recognition of his seventy years membership of the Institution.

Charles Sparrow is now 96, has lost his sight, and lives in a nursing home on the central coast of NSW. His old friend Graeme Andrews reports that he greatly appreciated the honour. An article by Graeme Andrews about Charles Sparrow's career appears below.

A MAINLY MARITIME LIFE Charles Sparrow OAM FRINA, the Designer of the VJ

Graeme Andrews

The Vacluse Junior — the ubiquitous VJ — changed the sailing scene in Australia. It was the first “unsinkable” inexpensive sailing skiff and it taught generations of sailors their trade. The design was prepared by Charles Sparrow who was “between jobs” during the Great Depression and he gave all financial rights to the plans away. To this day he has never made a cent from the VJ.

Charles Sparrow was born in England in 1906 and now lives in retirement, alone, at Wyoming, north of Sydney. His wife of some sixty years or more is no longer with him and his eyes and legs are not as good as he would wish them to be. A long-time member of the Sydney Heritage Fleet, he was happy to talk of his career as a naval architect and to be part of the Sydney Heritage Fleet's collection of the memories of people whose career is of more than normal interest.

“When my father retired from the Royal Navy we moved first to New Zealand and then to Australia, seeking employment. My father eventually joined the Royal Australian Navy as a Paymaster Warrant Officer and we all moved to Williamstown in Victoria. The Navy moved my father to the old training ship *Tingira* in Rose Bay and I completed my schooling in Sydney soon after World War I.

“I was able to obtain an apprenticeship as a shipwright at Cockatoo Island, leaving for work every morning and going by tram and steam ferry to the island. This was about 1921 and my ambition was to transfer into the drawing office on the island. I was able to do this and completed the last three years of my apprenticeship there.

“At the end of this time I was able to be classified as a shipwright draughtsman and I was eligible to join the Shipwright's Union if I wanted to. The Great Depression was looming and there was already much unemployment. I worked on some of the drawings for the new and unusual-looking RAN aircraft carrier *Albatross*, and the very large cargo steamers *Ferndale* and *Fordsdale* which were refrigerated ships of great capacity.

“All of these were built at Cockatoo Dockyard. There's nothing happening there now.

“When I had decided to get into the Drawing Office, I joined the Technical College which was then in Balmain. There was no degree course in those days, and all you could do was a three-year lower course and a two-year higher course, followed by a two-year Diploma in Shipbuilding.

“Because there were not enough students I could not do the

Diploma course, but I was allowed to continue the classes in conjunction with the lower classes and, at the end of my time, I was not given a Diploma but received instead a statement from the Technical College that I had completed this course satisfactorily. In later years a group of us who were members of the Royal Institution of Naval Architects got together to try to get a Diploma or Degree course in naval architecture going. We were successful and there is now such a course at the University of NSW.

“My first job in the drawing office was working on the plans for the seaplane carrier *Albatross*. I did things such as awning stanchions and rails and then I was asked to draw a body plan that showed every frame. I can still see that plan as every frame had to meet a certain spot, because of the rake of the keel. I had to be just right and I was very proud of that plan. I was very young. The ship was transversely framed and she had a bulge or a blister along each side which would contribute to her stability.

“I was at Cockatoo Dock from 1921 to 1927, becoming a journeyman draughtsman and I was there when *Albatross* was completed. The Depression was happening and there were many slack periods on the island. After the carrier was completed. I applied for a job at the State Dockyard in Newcastle and got it, but I was only there for about one year before I was put off. The State Dockyard was then on Walsh Island which was a genuine island.

Charles Sparrow when at Walsh Island



“One of the main jobs on the island then was building the self-cleaning floating dock. It was capable of putting one part of itself at a time inside the rest for maintenance and cleaning. Other jobs we did there then was building one railway carriage a week, and welding great pipe sections for the Water Board.

“Walsh Island more or less closed down, the cranes and much gear was sold and went to Morts Dock in Sydney and so did I. I was on hand for the building and launching of the last pilot steamer, *Captain Cook*. I was at Morts for less than a year before I was put off once more — last on, first off. I then spent some time at Holden body builders, making drawings of dies for mudguards. I was feeling very insecure there and decided to look about for work as a shipwright. I hoped to get in with Australian Steam Navigation Co. who did much repair work on ships visiting Sydney. Captain Mathers, who was Marine Superintendent, was drawing up plans for ship alterations, one of which would be the *Ormiston*, and finding out that I was a draughtsman, he put me on unofficially. I worked upstairs in the loft, doing his drawings. When anybody official arrived I had to disappear.

“I tried my hand at other things. It seemed that everywhere you went you were told that there was no work. This was about 1931 and I often went sailing in 12 ft sailing boats of the Vaucluse Sailing Club. I sailed often with a well-known Sydney gun dealer, Sil Rohu. He lived on the waterfront at Vaucluse and knew how keen young boys were on water sports. He had the idea of forming a sailing club for boys of less than 18 years old and asked me if I could design a boat that would be easy to build and safe to sail. Preferably the boat could be built by a boy and his father at home.

“I prepared drawings of a simple vee-bottom boat, decked in with a cockpit just large enough for two boys’ feet. The first boat built from my first plans was *Splinter*, built by the members of the Vaucluse Amateur Sailing Club and thoroughly tested. Minor adjustments were made and final drawings were prepared for sale. The first boat was built to the modified plans and was called *Chum* and was launched in August 1931.

“The first Vaucluse Junior, or VJ as it was better known, required £4 10s worth of timber. The fastenings were 13/6d, sails were £3 5s and the total for the boat was £9 2s 6d.

“The thirties were the years of the Great Depression and there were no government handouts. Shipbuilding stopped and, unemployed, I applied for whatever job I could find. I was offered a job as a technical instructor teaching Papuans on Fergusson Island in Papua — I took it.

“Before leaving, I donated the plans of the VJ to the club, stipulating that any monies from the sales would go to the club. When giving the rights to the club I did so on the understanding that my name would appear on all sets of plans which then cost 10/6d, as the designer, but in the late 1990s I found that the original Vaucluse Junior Sailing Club, which we founded and which made me a Life member, is now the Vaucluse Yacht Club and has no connections with VJs.

“During several years in Papua, Sil Rohu kept me advised on the progress of the club and of the VJ, telling me of enquiries for plans from England, Canada, USA, India, Denmark and New Zealand.

The Australian Naval Architect



Charles Sparrow with a VJ at the Powerhouse Museum

“As the club grew it was hoped that lads who reached 18 would move into the open 18-footers but this didn’t happen so Sil suggested to me that I design something larger that might keep the boys in the club. The result was the Vaucluse Senior, the Vee Ess, which was similar to the VJ but was beamier and three feet six inches longer. It had a cockpit big enough to allow two boys to camp under a sail over the boom. The Vee Ess became popular and after the war, 100 of them were sent to Japan for use by the Australian Army Occupation troops.

“With two new classes available, there was a need for a new club and a site was found in Marine Parade, Watsons Bay. The new club was opened by the Post Master General, Sir Eric Harrison, on 28 October 1939. Sil Rohu died in 1940 and, many years later on 12 July 1963, his wife and I were made life members of the club.

“I was in Papua for about five years, during which time I met my late wife when she came up on a visit. I suffered most of the tropical diseases of the time, and I still have a weeping tropical ulcer in my leg from that time.

“I heard from my father that there might be a job at Garden Island in Sydney, so we paid our way home and I managed to obtain a position as a ship’s draughtsman in the drawing office. I was later sent to Cockatoo Dockyard as Assistant Naval Overseer. There was a great increase in naval building around 1938 with corvettes, the *Kookaburra*, the destroyer *Arunta* and so on.

“Towards the end of the construction of *Arunta*, I was sent to Brisbane to take over as Naval Overseer at the Evans Deakin shipyard. The Principal Overseer in Brisbane in those days was Commander Berry Smith. We stored furniture in Sydney and rented in Brisbane as there were plenty of empty houses left by locals who had moved inland, thinking the Japanese were near.

“There was an enormous amount of work going on in Queensland. I had a staff of a Warrant Officer Shipwright, a Chief Shipwright, two Chief Engine Room Artificers and two civilians. The main firms we dealt with were:

Evans Deakin — overseeing hull construction of corvettes, frigates and repairs to war damaged ships. I provided technical advice to the drawing office staff and supervised the numerous tests and trials required by the Navy.

Peter’s Slipway — joinery work for Evans Deakin and repair and maintenance of small craft.

Faulkner Machinery Co. — inspection and testing of shackles and chain cables for all the new ships.

Norman Wright, boatbuilders of Bulimba — construction of several Fairmile patrol boats, small boats for ships and building several landing craft.

South Brisbane and Cairncross Docks — maintenance and repair of war damaged ships, the largest being a Royal Navy aircraft carrier.

“Every day something interesting happened but one incident is worth a mention. Some welding was needed on the shell plating of a naval ship, but the area needing work was right under one of the magazines. Normally this would require removing all the ammunition which would have meant an extra two days in the dock. After inspecting the area I decided that the job could be done with the ammunition in place. I asked one of my uniformed staff to take a wet bag and a bucket of water into the magazine and, if there was any sign of heat scarring on the internal plating, to cool it with the bag. He was scared so I had the job to myself. The paint did

begin to blister but the bag worked, happily, and the ship was soon back on the job.

“My job took me as far as Mackay where store punts were being built for the Royal Navy. Six of these things were afloat when a cyclone hit and they ended up all over Mackay.

“In Maryborough where corvettes were being built, the builders used to leave hull plates off on either side of the boiler room so that if a cyclone came the resultant flooding of the Mary River would not knock the ship off the blocks. It would not have done the engines much good but it was a precaution which, luckily, was not needed.

“When the war ended there was much tidying up to be done with half-built ships needing to be dismantled and bits and pieces all over the place. We came back to Garden Island and I became Chief Draughtsman and then Senior Naval Architect in charge of the drawing office. I became a Fellow of the Royal Institution of Naval Architects of which I am very proud — from apprentice to an equal member of that body.

“I worked at Garden Island until I was 60. I did not realise I had cataracts forming over my eyes until I criticised a draughtsman for not pressing hard enough with his pencil on a drawing. My assistant was puzzled, telling me that the lines looked fine to him. A specialist gave me the bad news, so we decided to retire to a weekend at Wyongah on Lake Tuggerah. Here I lived with my late wife for many years, doing the engineering drawings for new houses (needed because of the area’s mine subsidence) and designing various fishing vessels and one charter ferry, the *Tamboi Queen*, still in use in modified form at Port Stephens. She had to be of shallow draft, stable and able to carry two bus loads of tourists. She was a great success.”

With the aid of a magnifying glass Charles Sparrow keeps up with marine and sailing matters as well as he can, sadly contemplating the decline of Australian shipping and the shipbuilding industry of which he was a part for so long.

This article was first published in Australian Sea Heritage.

***Raw Nerve* Strikes Problem in Record Attempt**

On 17 July 2002 the 17 m ocean racing catamaran *Raw Nerve* crossed the starting line in Hobart for an attempt to break the round-Australia sailing record. The intention was to sail up the east coast of Australia in order to complete an anti-clockwise circumnavigation of over 6 500 n miles. The current record is 43 days 19 hours 29 minutes and 55 seconds. It was set in 1999 by *Magna Data* skippered by Kanga Birtles. The attempt was sailed under World Speed Sailing Council rules with the Royal Yacht Club of Tasmania timing the challenge.

Raw Nerve, skippered by Martin Riley and built by Southern Ocean Multihulls, is a state-of-the-art ocean racing catamaran that has won Australian Design Awards for excellence in industrial design and engineering. The 17 m craft has a beam of 10.6 m and a mast height of 25.15 m.

On the fourth day of the anticipated 30-day voyage, a rigging failure caused the mast to collapse when *Raw Nerve* was about 200 n miles east of Brisbane. *Raw Nerve* motored to port after recovering the rig.

Raw Nerve (Photograph Southern Ocean Multihulls)



NAVAL ARCHITECTS ON THE MOVE

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

Tony Armstrong (the younger) has taken up an eighteen-month secondment as a naval architect in Teekay Shipping's head office in Vancouver. The role is in their engineering project group which includes tanker new construction, FPSO/FSO and fleet support.

Matthew Cleary moved on from Det Norske Veritas about a year-and-a-half ago and started work for his PhD at the University of Sydney. He is researching the use of mathematical modelling to predict the behaviour of enclosure fires, which occur in ships and in residential and commercial buildings. In particular, he is looking at the formation of carbon monoxide which is the chief killer in fires.

Nick Barratt continues with WaveMaster International, and has added some of the duties of Design Manager to his portfolio.

Scott Davenport has moved on from WaveMaster International and has taken up a position as a naval architect with Image Marine in Fremantle.

Yuriy Drobyshevsky has moved on from Kvaerner and has taken a position as Supervising Engineer (Offshore) with Intec Engineering in Perth.

Roger Duffield has completed his six-month secondment to the Integrated Design Team working on the design of the Type 45 frigate at BAE Systems in Glasgow, Scotland, and returned to his position as a naval architect with the Concepts and Costing group in Navy Systems Branch in Canberra.

Peter Gawan-Taylor has moved on from WaveMaster International and has taken up a position as Design Manager with Sea Spray in Dubai, building aluminium boats.

Brendan Gray, after finishing at UNSW, stayed on at the Unigym for a year or so, then decided to get a "real" job and ended up crunching numbers for Zurich in North Sydney. Discovering that he was allergic to working at a desk for eight hours a day, he headed back to work for Unigym until his girlfriend finished her degree. He's now living in Southport, Qld, and studying physiotherapy at Griffith University, with one session down and nine to go. He says that he has no plans to be employed as a naval architect; his industrial training cured him of that. He did, however, enjoy his degree and will be using his knowledge to build/refit a yacht in a year or two, so his time at UNSW wasn't wasted!

Tristan Harris has now taken up a position in sales for a company called Simply Wireless who are wireless network integrators in Sydney. He says don't ask how IT sales and naval architecture are related; you'd be pushing to find an answer! However, he is loving what he is doing and spends every spare minute boating, so he hasn't lost his love of the sea and all things nautical.

Mike Henderson-Kelly has moved on from WaveMaster International and has taken up a position with London Offshore Consultancy in Perth.

Brad Hillman continues as the Technical Superintendent for Interorient Navigation Co. in Limassol, Cyprus.

Chris Hutchings has moved on from Sea Transport Solutions and has taken up a position managing a new company,

Oceanic Yacht Design, which was set up under the Sea Transport Group umbrella to cater for pleasure craft.

Daal Jaffers moved on from WaveMaster International about a year ago and headed for those misty little islands off the coast of France. He worked as a naval architect for Nigel Gee and Associates for a while, but has recently moved on from there to embark on a three-and-a-half-month tour around Europe. Daal writes that he is three weeks into the tour now and loving every minute of it. He is in Madrid at the moment, getting out of the heat for a while.

Mark Korsten, after finishing his degree at UNSW, moved to Hobart with the Royal Australian Navy for a year. From there he was posted to *Young Endeavour* as the Executive Officer, then moved to a role liaising with the NSW Police Force for Olympic Security; great fun, and very interesting. From there he went to East Timor for six months which, he says, was probably the most interesting time of his career. His current job, still with the RAN, is based in Melbourne, working for the Defence Strategic and International Policy Division which develops our international strategy and manages relationships with our neighbours. In the midst of all this, he bought a property on the Clyde River between Bateman's Bay and Nelligen, and he and Tamara were married on the river beach with most of the guests either camping or staying in houseboats.

Isireli (Isi) Lyons has departed for the 'land of the long white cloud' after several years working for the Department of Defence in Canberra and Sydney. Isi became a familiar face around Canberra as he featured prominently on the back of several busses as part of a promotional campaign for public transport.

Todd Maybury has moved on from Computer Sciences Corporation, and has taken up a position as a naval architect with North West Bay Ships in Sydney.

David Pryce, fresh from his circumnavigation of the world (see *The ANA*, May 2002), has (at least temporarily) hung up his wet-weather gear, stepped ashore and taken up a position as a naval architect with North West Bay Ships in Hobart.

Aminur Rashid of the Department of Defence Navy Systems Branch has begun a period of about six-months industry rotation in the Sydney offices of Det Norske Veritas.

Alex Robbins, who recently moved on from Incat Designs and headed for the UK (see *The ANA*, May 2002), has now taken up a position with Nigel Gee and Associates in Southampton.

Robert Rostrom has moved on within Det Norske Veritas, and has taken up a position as a Plan Approval Surveyor in the Conversions, R-Ro, Offshore Support and Special Ships Group in Oslo, Norway.

Greg Shannon, a graduand of The University of New South Wales, has taken up a position as a naval architect with North West Bay ships in Sydney, working part time while he completes the arts requirements for his combined BE/BA degree.

Evan Spong has been beavering away for his PhD in adaptive

electromagnetic turbulent boundary layer control at The University of New South Wales for the past three years, and is planning to submit real soon now. In between times, for the last eighteen months he has been keeping the wolf from the door by working part time as a naval architect for North West Bay Ships in Sydney.

Robin Virant, a Maritime Engineering graduate of the Australian Maritime College is now the Engineering Manager at Andersen Yachts (Thailand) Ltd. AY(T) build the Hans Christian line of traditional yachts, and a newer Explorer 48. All yachts are manufactured wholly in Thailand for export to the USA and Europe.

Bruce Williams, a recent Ocean Engineering graduate of the Australian Maritime College, has taken up a position as a project engineer with Subsea Developments in Perth.

Dominic Worthington, after completing his marine engineering exams at the Australian Maritime College, has been working as Extra Third Engineer on, firstly, *Devil Cat*, then *Bass Trader* and *Spirit of Tasmania II*. He flew to Greece in June to bring back *Spirit of Tasmania II*, one of the new monohull ferries for the trans-Bass Strait route.

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 Keith Adams when your mailing address changes to reduce the number of copies of *The Australian Naval Architect* emulating boomerangs (see *Missing in Action*).

Phil Helmore

Gregor Macfarlane

MISSING IN ACTION

The following members are missing.

S. Abbott, last known address Mowbray, Tasmania.

A. P. Shea, last known address Rosny Park, Tasmania

D. Wilde MRINA, last known address Balmoral, NSW.

B. A. J. Williams, last known address Launceston, Tasmania.

If anyone knows their present whereabouts, please let Keith Adams know on (02) 9876 4140, fax (02) 9876 5421 or email kadams@zeta.org.au.

MEMBERSHIP NOTES

AD Council meetings

The Australian Division Council met on 19 June, with teleconference links to all members and the President, Bryan Chapman, in the chair in Sydney. Matters, other than routine, which were discussed included:

- The Pan-Asia Association of Maritime Engineering Societies (PAAMES): RINA was represented by the AD President at the Asia Maritime Forum in Kobe, Japan over 21–23 May, and the inauguration of PAAMES. Ten other learned societies from countries in the east Asia and south-west Pacific region also attended. RINA did not sign the declaration promulgating the association. However, it was made clear to the organisers that RINA, and particularly the Australian Division, will support and promote PAAMES and its activities wherever possible, and that the absence of formal links should not be allowed to inhibit the development of informal links.
- The Walter Atkinson Award Nominations for 2001: Three nominations have been received for the award for 2001 and will be considered by the Council sub-committee soon.
- The Walter Atkinson Award Revised Conditions for 2002: A set of revised conditions, opening the award to all authors, including members, members of council, and non-members (in accordance with the resolution passed at the May meeting), was tabled and, following discussion and some modifications, was approved. The revised conditions have subsequently been circulated to members of Council and Section Secretaries (see below), and will apply for the 2002 award and onwards.
- RINA/IEAust Joint Board Matters: No progress since the last Council meeting; there is a teleconference

scheduled for tomorrow.

- RINA Website Manager: Tim Dillinbeck has resigned as Website Manager, and Council ratified Mike Warren as his successor in this position. Subsequent to the meeting, David Gosling resigned as Technical Manager for the website, and the Executive Committee has approved the appointment of Jude Stanislaus as his successor in this position.
- Appointments Vacant: A proposal was tabled to circulate details of new Appointments Vacant (without reference to the website) via Section Secretaries and email lists. This was amended to allow circulation of advice of the fact whenever there is a new Appointments Vacant advertised on the RINA website via Section Secretaries and email lists of members (only), but not the details of the appointments themselves. This is in addition to the subscribe/unsubscribe feature which has *subsequently* become available to registered users (members and non-members) on the Appointments Vacant page of the website to allow automatic email advice to members whenever there is a change to that page.
- Executive Committee: Phil Helmore has resigned from the Executive Committee of the Australian Division Council. This position is drawn from members nominated to the Division Council by the Sections, and Council ratified the appointment of Stuart Cannon as the new member of the Executive Committee.
- Marine Safety 2002: Council nominated Bob Dummett, a member of RINA's Safety Committee, to represent RINA at this NMSC conference in Brisbane on 6 and 7 August.
- Professional Indemnity for Members: The RINA Professional Indemnity scheme available for members

worldwide has been withdrawn, and a new scheme is being sought. Other possibilities for members in Australia are being investigated by the Australian Division.

The next AD Council meeting is scheduled for Wednesday 18 September.

Changes to the RINA AD Website

A number of changes have been made to the AD website. The principal ones affecting users are:

- Council resolved at its June meeting to advise members (only) by email of changes to the Appointments Vacant page. This would be done via the Section Secretaries and their member email lists, the idea being to make changes to the Appointments Vacant page known quickly.
- The feature of being able to subscribe/unsubscribe to the automatic email advice service which was available to registered users (members and non-members) on some pages has *subsequently* been extended to most pages on the site. This means that, if you have chosen to subscribe to, say, the Appointments Vacant page, the Tasmania Section page and the Tasmania Program of Meetings page, then any time there is a change to any of those pages you will receive an email advising you of the fact. The advantage is that you then don't have to go and look at the site daily (or weekly or monthly) to find out if there are changes which interest you; the advice comes to you.
- The above changes occurred just prior to an advertisement being posted by Oceanfast, and so you should have received notification of the ad by two possible means.
- It is expected that these advice-of-changes features will make the Appointments Vacant page of the site more attractive to both employers and job seekers to post their advertisements on the site.

The Walter Atkinson Award 2001

The Council sub-committee has decided that the Walter Atkinson Award for 2001 should be presented to Jonathan Duffy and Martin Renilson for their paper *The Effect of Channel Design on Ship Operation in Port*. The paper was presented at Coasts and Ports 2001, 25–28 September 2001, Gold Coast, Queensland.

Revised Conditions for the Walter Atkinson Award

At its meeting on 19 June, Council resolved to change the conditions of the Walter Atkinson Award. The revised conditions, together with the Appendix which sets out the thinking behind the wording, are reproduced here and will apply for the 2002 award and onwards.

The Man

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

The Australian Naval Architect

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.

The Award

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 wishes to broaden the eligibility criteria, while adhering as closely as possible to the original intent and have 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.”

Selection Criteria

Eligibility:

- The nomination may be for a presentation which includes a written technical paper, or for a technical published paper, and it must be more than just a promotional presentation.
- The paper must be first presented at a maritime conference or RINA meeting within Australia, or first published in a maritime journal within Australia, during the current year.
- All authors are eligible.

Assessment:

The following are considered:

- Is there a stated or implied purpose?
- How important is that purpose in the context of the Australian industry?
- Does the paper have any new ideas to impart?
- How easy is the paper to understand?
- How rigorous is the paper?

Nominations

Nominations for the Walter Atkinson Award are made by members in writing to the Secretary of the local Section (or, for NT or SA residents, the Division Secretary). Nominations must include a hard copy of the paper for assessment, except for papers published in *The ANA*. It is the responsibility of the nominator to obtain the consent of the author(s) of the paper to the nomination.

Assessment

Sections then consider the papers nominated to them in the light of the assessment criteria and each make one or more recommendations to the Australian Division. A sub-committee of the Australian Division Council considers the nominations in the light of the assessment criteria and decides

the award, which is then announced in *The ANA*.

No member of a local Section Committee or the Australian Division Council who is an author or contributor to a paper may be involved in the nomination or decision process at any stage.

Appendix: The thinking Behind the Wording

Preamble

It was thought by Council, when changing the conditions of the award in 2002, to be beneficial to have the thinking behind the wording in various places set down for future guidance.

The Thinking in the Object

The word “members (of the Institution)” was deleted to widen the scope of eligible authors. The words “the naval architecture community in Australia” were substituted for “the Institution” to widen the scope of where papers may be presented or published. We are an institution of naval architects, and the intent is to include papers presented at meetings and conferences which naval architects would typically attend, or in journals which naval architects would typically read.

The Thinking in Eligibility

The words “which includes a written paper” were inserted in lieu of the previous “not simply a lecture” in order to spell out the requirement. It is impossible for committees to assess presentations which they did not attend and which are not accompanied by a written paper.

The words “first presented” and “first published” were used to ensure that the first presentation or publication was made in Australia, because the Object of the Award says “to raise the standard of papers ... in Australia”. This precludes the first presentation of a paper or publication overseas and subsequent presentation or publication in Australia from being eligible. It does not preclude this sequence of events from happening and, in fact, it should happen, as it is a good source of presentations to local Sections.

The words “maritime conference” or “maritime journal” were used to include conferences which naval architects would typically attend or journals which naval architects would typically read. This precludes a paper presented at a conference on composites, or published in a journal on corrosion, for example, from being eligible by not being widely available to naval architects. However, the same paper, presented at a maritime conference or in a maritime journal (where you would expect a significant number of naval architects in the audience or readership), *would* be eligible.

The condition “All authors are eligible” was inserted to indicate that all contributors to the paper are eligible and that, in the case of multiple authors, the award is to be shared equally among them.

The Thinking in Nominations

The word “members” was inserted to indicate that nominations may *only* be made by members.

The sentence “Nominations must include a hard copy of the paper for assessment” was included because not everyone attends all conferences or reads all journals, and this ensures that subsequent assessors have access to the paper. The sole

exception is for a paper published in *The ANA*; no copy is required in this case as all members are expected to have their copies on hand for ready reference.

The sentence “It is the responsibility of the nominator to obtain the consent of the author(s) of the paper to the nomination” was included to do the right thing regarding personal privacy. In most cases, it is simple courtesy and keeps the author(s) informed. In the one case where it *does* matter, asking and being refused avoids the potential problem.

The Thinking in Assessment

The words “in the light of the assessment criteria” were inserted to indicate the importance of the criteria in the assessment. Each of the criteria carries equal weight. It may help assessors to rate each of the criteria out of 10 for each paper.

The wording of the number of recommendations made by Sections to the Division was changed from “one recommendation” to “one or more recommendations” to allow for multiple nominations where Sections consider that they have a number of worthy entries. However, this is not a mechanism for forwarding the assessment task, and it is incumbent on Sections to reduce the amount of subsequent assessment by minimising the number of their recommendations consistent with quality. It is expected that the number of nominations from a Section would be one, or two if they really can’t decide.

The final sentence “No member of a local Section Committee or the Australian Division Council who is an author or contributor to a paper may be involved in the nomination or decision process at any stage.” was included to prevent any conflict of interest.

Phil Helmore

RINA Council and Committee Members

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

Australian Division Council

President	Bryan Chapman
Vice-president	Robin Gehling
Secretary	Keith Adams
Treasurer	Allan Soars

Members nominated by Sections

Tony Armstrong (WA)	Phil Helmore (NSW)
Stuart Cannon (Vic)	Brian Hutchison (Qld)
Nick Whyatt (ACT)	Gregor Macfarlane (Tas)

Members appointed by Council or elected by national vote

Jim Black	Tim Dillenbeck
Robin Gehling	John Jeremy
Andy Tait	Michael Warren

Executive Committee

Chair	Bryan Chapman
	Keith Adams
	Alan Soars
	John Jeremy
	Stuart Cannon

The Executive Committee is responsible for addressing

any issues that arise between the regular Division Council meetings.

ACT Section

Chair	Bert Thompson
Deputy Chair	Dave Magill
Secretary	Bruce McNeice
Assistant Secretary	Martin Grimm
Treasurer	Nick Whyatt
Members	John Colquhoun, Robin Gehling, Kerry Johnson, Tim Lyons and Warren Smith

NSW Section

Chair	Bob Dummett
Deputy Chair	Jennifer Knox
Secretary	Jennifer Knox
Assistant Secretary	Todd Maybury
Treasurer	Bob Dummett
Members	Lina Diaz, Don Gillies, Phil Helmore, Rod Humphrey, Bruce McRae, Graham Taylor and Andrew Tuite

Queensland Section

Chair	Brian Robson
Deputy Chair	Geoff Glanville
Secretary/Treasurer	Brian Hutchison
Members	Ross Burchill, Graham Jacobs, Stephen Plummer, James Stephen and Ron Wright

Tasmanian Section

Chair	Gregor Macfarlane
Secretary	Oliver Mills
Treasurer	Muike Miller
Members	Mark Hughes, Wade Limpus, Ian Lund, Alan Muir, Kay Myer and Giles Thomas

Victorian Section

Chair	Stuart Cannon
Secretary	Samantha Tait
Treasurer	Ken Hope

Western Australian Section

Chair	Kim Klaka
Deputy Chair	Steve Harler
Secretary	Jim Black
Treasurer	Damian Smith
Members	Roger Best, Kalevi Savolainen and John Wood

Website

Division	Mike Warren, Jude Stanislaus
ACT	Bruce McNeice, Ian Laverock
NSW	Jennifer Knox, Phil Helmore
Queensland	Brian Hutchinson, Brian Robson
Tasmania	Gregor Macfarlane, Oliver Mills
Victoria	Stuart Cannon, Samantha Tait
Western Australia	Kim Klaka, Steve Harler

Safety Group

Chair	Robin Gehling and Bob Dummett
Members	Mike Seward, Andrew Tuite

The primary function of the Safety Group is to maintain an awareness of marine safety as it affects the Australian maritime community and advise the Division Council on

relevant Division policies and attitudes.

Membership Group

Chair	Tony Armstrong
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The primary task of the Membership Group is to develop and implement strategies to recruit eligible people in Australia as members of the Institution. This responsibility was delegated to the WA Section because of its positive experience in this area and Tony Armstrong was nominated as sub-committee chairman. Individual sub-committee members are not specified.

The Australian Naval Architect

Editor-in-chief	John Jeremy
Technical Editor	Phil Helmore

RINA London

Council Members	Bryan Chapman (ex-officio) Noel Riley
Safety Committee	Robin Gehling
Small Craft	Noel Riley
High-speed Vessels	Tony Armstrong, Phil Hercus

Pacific 2004 IMC Organising Committee

Chair	John Jeremy
Members	Bob Campbell, Keith Adams

RINA/IEAust Joint Board of Naval Architecture

Members	Bryan Chapman, Noel Riley
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The Joint Board of Naval Architecture was set up under the terms of the Heads of Agreement between RINA and IEAust. to oversee implementation of that agreement. A major objective of the Joint Board at present is the establishment of a National Professional Engineers Register (NPER) category of Naval Architecture.

NPER Naval Architecture Competency Panel

Members	Tony Armstrong, Werner Bundschuh, Jim Black, Stuart Cannon, Bryan Chapman, Allan Taylor and Andrew Tuite
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The objective of the NPER Competency Panel is to define the competencies which comprise naval architecture to facilitate the establishment of an NPER category of naval architecture.

Marine Safety Victoria Marine Industry Advisory Group

Members	Bryan Chapman, Mark Hughes and Dennis Pratt
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Australian Maritime College Industry Advisory Group

Member	Noel Riley, Tim Speer and Martin Grimm.
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Standards Australia Committee CS051 Yachting Harnesses and Lines

Member	Bruce McRae
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Standards Australia Committee AV006 Machinery Noise

Member	Mark Smallwood
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[The Executive Committee has compiled this list from Division records and personal knowledge. Please let Keith Adams know if there are any errors or omissions —Ed.]

FROM THE ARCHIVES

Our photograph 'from the archives' shows the BHP cargo ship *Iron Wyndham* under construction in Whyalla in March 1952.

In 1944 work began to further develop the iron ore resources of Cockatoo Island in Yampi Sound, WA. To transport the ore to the east coast steelworks BHP approved the construction of four 12 500 ton deadweight ships that became known as the Yampi class. The keel for the first, *Iron Yampi*, was laid at Whyalla on 30 November 1945. The new ships were designed by the BHP naval architect Mr R. A. Preshaw and the Whyalla Shipyard superintendent Mr A. Dalziel, and all plans were prepared in the shipyard. They were shelter-deck type general-cargo steamers with longitudinal framing at bottom, topsides and deck. The ships were of rivetted construction.

Iron Yampi introduced turbine propulsion to the BHP fleet and was fitted with a three-stage Parsons turbine geared to a single shaft delivering 5 500 hp at 115 rpm. Machinery for the first ship was built in England, but the engines for the following three ships were built in the BHP Newcastle Steelworks machine shop. Three coal-fired Babcock and Wilcox boilers supplied the steam. Oil could be used as a secondary means of firing.

Construction of the class was delayed by steel shortages and

other priorities. *Iron Yampi* was commissioned on 9 June 1948 and the last, *Iron Wyndham*, on 26 February 1953. The ships began the trade for which they had been designed in 1951, a round trip of 21 days comprising a leg in ballast from Port Kembla around the top of Australia and a return leg with 11 400 tons of ore by the same route. The ships could also carry 2 740 tons of fresh water for Cockatoo Island which had no assured water supply.

Iron Wyndham was 9 460 grt and was 152.9 m long with a beam of 20 m. She made 12.8 kn on trials. During her service with BHP she also undertook voyages to Singapore, Manila, Hong Kong, Japan, Taiwan and New Zealand.

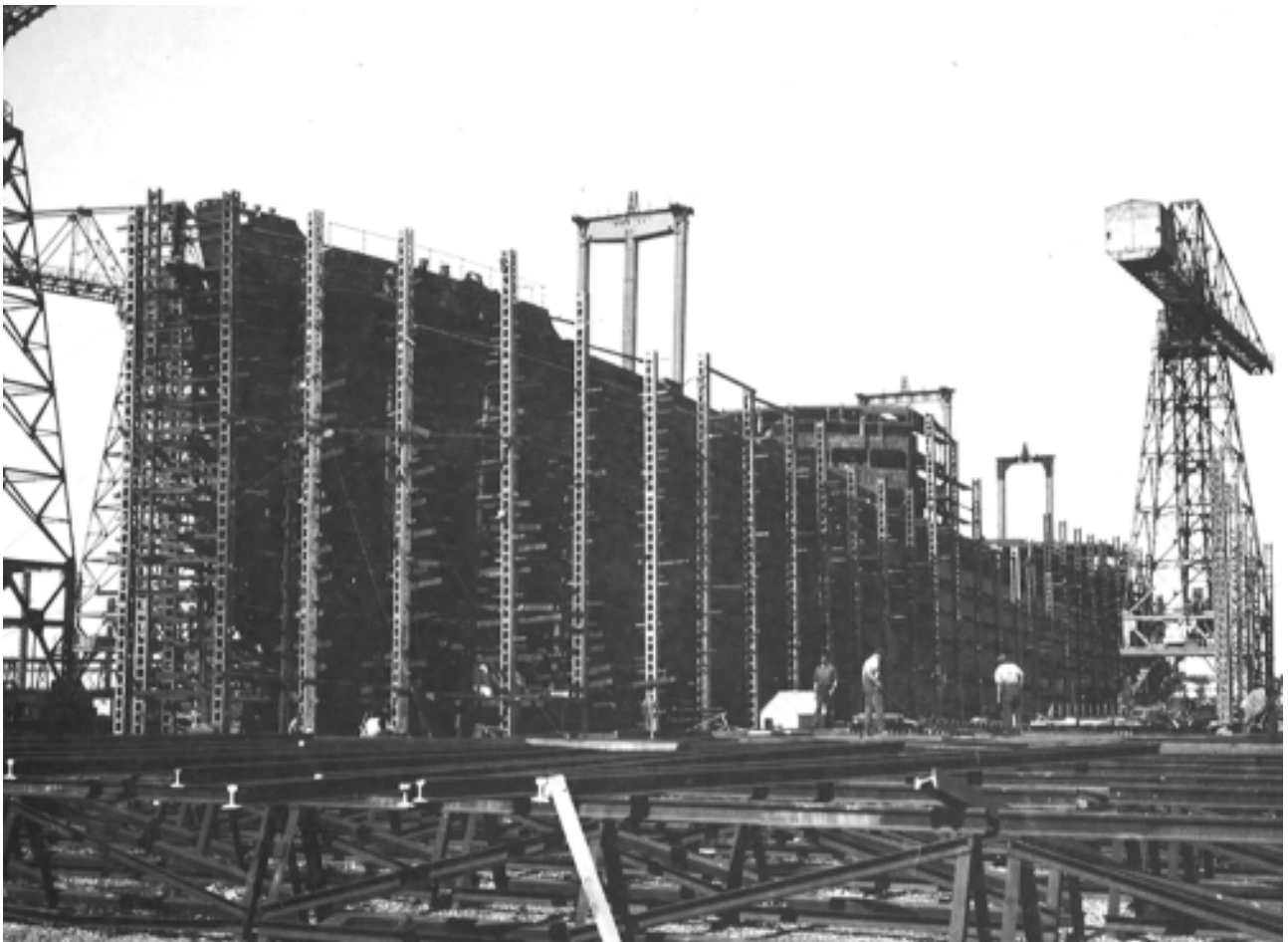
During the early development of the Mt Newman Mining Company project she carried heavy equipment from Kwinana and on 16 July 1968 she became the first of her class to visit Port Headland. On one voyage in 1969 she carried 43 heavy ore car bodies in her holds and lashed to the hatch covers.

She was sold to Union Brothers Marine Corp. of Taiwan in October 1976 and, after some further service as *Union Atlantic*, was broken up in Taiwan in 1979.

Reference

Denis M. Riley, *The Iron Ships: A Maritime History of BHP 1885–1992*, BHP Transport Limited, 1992.

Iron Wyndham under construction at the Whyalla shipyard of BHP Limited in March 1952
(Photograph courtesy Bryan Chapman)





We are where you are.

Wärtsilä is the world's leading supplier of complete ship power solutions and a major provider of turnkey solutions for distributed power generation. In addition Wärtsilä operates a successful Nordic engineering steel company. More than 10,000 service oriented people working in 50 countries help Wärtsilä provide its customers with expert local service and support, wherever they are.

