THE AUSTRALIAN NAVAL ARCHITECT

Volume 6 Number 1
February 2002

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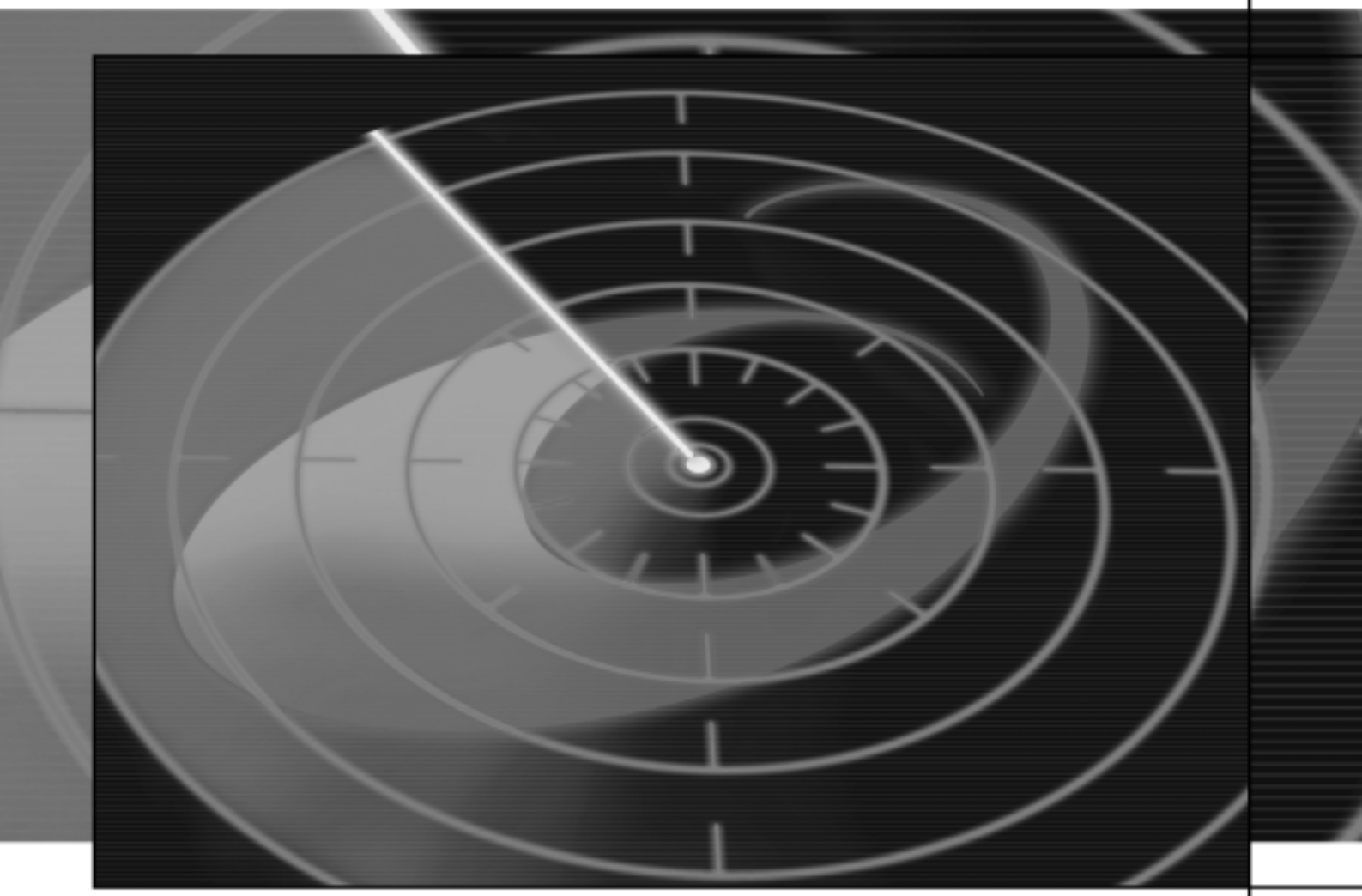

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THE AUSTRALIAN NAVAL ARCHITECT

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The Royal Institution of Naval Architects
(Australian Division)

Volume 6 Number 1
February 2002

Cover Photo:

The magnificently-restored *Sayonara*, built in 1897, during a race on Sydney Harbour in December. *Sayonara* came north from her home in Melbourne for the summer.

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RINA Australian Division
on the
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From the Division President

So, welcome to 2002! As I child I used to read comic books which portrayed the 21st Century as a time of peace and harmony, when people would be living on the moon and the planets and wonderful new technologies would have rendered marine transport a thing of the past. While the absence of peace and harmony is something of a disappointment, the continuation of marine technologies as very much part of the present day is reassuring.

Certainly 2002 is shaping up as an interesting year for the marine industry. For openers, the fast ferry industry apparently faces the challenge of market saturation. I understand that a number of large high-speed passenger catamarans are tied up around the world awaiting new owners, and much appears to depend on the industry's current push into the military world and its persistence in the fast freight market. It will be interesting to see how this all works out.

On the military front we can certainly expect some positive developments during the year. The patrol boat replacement project is scheduled to reach the contract signature stage either late this year or early in 2003. This is an innovative project to provide urgently-needed capacity. Developments will be watched with interest — not least by those hoping to build the vessels.

Another military project where I certainly hope there is some progress is the air warfare destroyer. The withdrawal of the Adams class has left a gap in the Navy's area defence capability which won't be covered for some time.

An issue much nearer to the grassroots is that of recreational craft safety. It has concerned me for some time that the design and construction of recreational craft has been virtually unregulated, even though commercial craft have to meet fairly stringent and well-defined requirements in the way of intrinsic vessel safety. This implies that the lives of recreational users are less important than those of passengers or crew and, in my view, this is not acceptable. So I was pleased recently to hear the Victorian Minister for Ports announce that this issue will be addressed not only in Victoria but on a coordinated national basis. I hope 2002 sees some significant progress in this area.

When Trevor Blakeley, the Chief Executive of RINA, visited Australia recently I went with him to visit the Maritime Platforms Division of the DSTO. Thanks to the kind cooperation of Division Chief, Dr David Wyllie, and his staff we were given an extensive briefing on the Division's activities and shown much of its work. These laboratories are one of the hidden treasures of the Australian defence establishment and the day we spent there was something of a revelation. I was certainly most impressed by the advanced nature of the work being done and the enthusiasm of the laboratory's staff.

On a final note I want to acknowledge the success of the recent Pacific 2002 International Maritime Conference and Exhibition and congratulate the organisers. These events appear to be well-established as key events on the international calendar and we look forward with interest to Pacific 2004.

Bryan Chapman

Editorial

The Pacific 2002 International Maritime and Naval Exposition held at Darling Harbour in Sydney at the end of January was well attended by visitors and delegates from many countries and clearly established the biennial event as an important occasion in the maritime calendar. The International Maritime Conference held in conjunction with the Exposition and the RAN Sea Power Conference was jointly organised by RINA, IMarEST and IEAust. Over 300 delegates came from some twenty-one countries.

The Exposition was opened by Senator The Hon. Robert Hill, Minister for Defence. In his address, he spoke at some length about the Government's strategic approach to defence industry. In particular, he emphasised the importance of a capable and sustainable industry base.

Australian defence industry has suffered for decades from the start-stop nature of defence programs, which has made long-term planning and the training of people with appropriate and enduring skills difficult. The Minister outlined an approach in which 'the primary driver for the relationship will be the sustainability of key defence industry capabilities, rather than open competition in all cases.' He said 'where it is appropriate, Defence's current project-by-project, "open competition" approach will give way to strategically linked programs offered to industry under long-term arrangements.'

The aim of the new approach is to provide industry with certainty and continuity of work, better planning guidance, and greater capacity to make a long-term investment in infrastructure, skills, training and research and development. Achievement of that aim will be welcomed by industry. Even the recognition of the importance of these benefits is a significant milestone.

For future naval projects the Government will be offering long-term multi-project work packages, as opposed to the traditional project-by-project approach.

This policy is likely to result in significant rationalisation of the industry base, as has occurred overseas in recent years; rationalisation that the market may have encouraged even in the absence of this approach. It will not be an easy policy to manage. It is much easier for governments to place contracts for individual projects in an environment of free and open competition, than in more restricted circumstances when robust arguments will be demanded to defend the policy against the questioning of non-participating industry keen to enter to enter the defence market. It will also be a challenge to keep the relationship between Defence and industry fresh and innovative.

The planned RAN ship construction program, including replacements for the replenishment ships, the LPAs and *Tobruk*, as well as air-warfare destroyers and later replacements for the FFGs, will test the new procedures. There is much to be done in a relatively short time if a 'bow wave' of work is to be avoided. If the Government's procurement plans, which have been developed in consultation with industry, succeed then there may at last be a chance to maintain a highly capable and sustainable industry in the long term.

Those with experience of past Defence/industry relationships will watch the development of this new approach with intense interest.

John Jeremy

From the Chief Executive

I read with great interest the Divisional President's column in the last issue of *The ANA*, and particularly his personal perspective of why he is a member of RINA. I suspect that his reasons are shared by the vast majority of RINA members world-wide. Nonetheless, I can well understand the view expressed by at least one Graduate Member concerning the funding of the Division. It could equally be the view of other members, not only in the Division, but elsewhere. Perhaps some facts and figures on the subject might be of interest to members of the Division.

Firstly, with regard to the annual grant to the Division, as stated by the Division President, it has increased significantly in recent years — some 30% over the past four years - and the Australian Division members receive over four times the per capita funding through the annual grant than all other members. This level of funding is justified by the additional cost of having a Divisional Council, providing the representation at national level which enables the Division to be, in effect, an Australian professional institution which is part of the international organisation that is RINA today.

So where does the rest of the annual fee go? It should first be noted that fees amount to less than 30% of the Institution's turnover. The remainder comes from the revenue from its very successful publications and its conferences, together with sponsorship and other grants. Its major items of expenditure are Headquarters, free or reduced-rate journals and publications to members (not everyone has access to libraries and not all RINA publications are in libraries) and free or reduced-rate fees for many members such as Student Members and retired members who also receive the free publications. It should also be noted that the net annual fee paid by a Graduate Member in his/her first two years after graduation does not cover the cost of the publications and postage they receive. And finally, the more observant members will have noticed that A$/£ exchange rate at 1 Jan 2001 was pegged to that which it had been on 1 January 2000. The 4.8% increase in the exchange rate more than compensated for the 4% increase in Annual Fees which came into effect in 2001 for all other members.

Of course, being a member of a professional institution such as RINA is much more than just about the tangible benefits which membership provides, as the Division President so rightly and succinctly points out in his column. Indeed, it might be argued that the most important benefits are those intangible ones.

May I also take this opportunity to thank those members of the Queensland, NSW and Melbourne Sections who made me feel so welcome when I visited the Division recently. I would also like to thank those members of the NSW Section Committee who crewed the RINA stand at the Pacific 2002 Exposition. It was a pleasure to meet the many members from all the Sections who called at the stand.

I have said on many occasions that if the Institution is to succeed as a modern international professional institution, responsive to the needs of its members, it must seek their views on what those needs are. Even in this shrinking world of faxes and emails, I believe that there is still no substitute for that personal contact which I gain from meeting and talking to members.

I came away with a number of suggestions which I will take up where possible, particularly the late delivery of journals. Also, when I left, there were eight more members than when I arrived! Meeting members also gave me the opportunity to update them on recent and planned developments, particularly regarding the RINA website. I would repeat the plea I made to them, for all members to register on the site and make full use of it. Suggestions on how the website, or any aspect of the Institution could be improved would be most welcome.

Once again, my thanks to all those members who made my stay in Australia so enjoyable and, for me at least, worthwhile. I look forward to my next visit to the Division.

Trevor Blakeley

Letters to the Editor

Dear Sir,

I would like to take this opportunity to congratulate you on what I consider to be an outstanding publication. Being an undergraduate student, I find *The ANA* to be an invaluable tool in identifying the latest trends and supplying technical data that is, more often than not, pertinent to my given assignments. The publication is full of excellent photographs that convey the bigger picture that would normally be hard to grasp from the written word. Many thanks, and I look forward to many hours of informative reading.

Julian Melling
UNSW student

Dear Sir

I moved from Perth to study naval architecture in Sydney. I am fortunate that my parents are able to afford for me to do this and follow my dream to design and built boats. With the industry being so large in Perth, I always thought there would be some way I could study naval architecture there. However, that was not the case, and I took the next best option and studied mechanical engineering at Curtin University and then moved to UNSW to complete my degree in naval architecture.

In these days of tight university budgets, is it possible to ever teach parts of naval architecture to more mechanical engineering undergraduates, whetting their appetite for this industry and getting them involved in new and dynamic projects? I hope that some of the readers of this journal may be able to do something to encourage more universities to at least think of having one basic naval architecture unit as an option, or taught as part of a course, in their mechanical engineering degrees.

Ben Smith
UNSW Student

NEWS FROM THE SECTIONS

Victoria

Three technical papers have been presented to members of the Victorian Section of RINA and IMarEST in the last few months.

In August 2001 John Lewis presented a paper entitled *Regulation of Shipping to Protect the Marine Environment: The How, Why and Wherefore*. John discussed how ships and shipping are becoming increasingly regulated to prevent oil pollution and degradation of the marine environment. He took examples from the international level such as the International Maritime Environmental Protection committee (MPEC) of IMO right down to state authorities such as the Victorian Channels Authority. Current concerns being addressed by these groups include the translocation of marine pests by shipping and the harmful effects of toxic antifouling paints.

John Lewis was presented with the Pieter Bossen Memorial Award for 2001 from the Victoria and Tasmania branch of IMarEST for this paper.

In September 2001 Alan Taylor spoke on *Suggested Designs to Facilitate Improved Management and Treatment of Ballast Water on New and Existing Ships* to members and their guests at the Institution of Engineers in North Melbourne.

The presentation dealt with the technical aspects of ship design to accommodate the changes. The transcript of the full report, written by Dr Geoff Rigby and Alan Taylor, can be obtained from the Agriculture, Fisheries and Forestry — Australia web site www.affa.gov.au, under publications. The report was published as Report No. 12 in the Australian Ballast Water Research Series.

In November 2001 Seref Aksu presented a paper on *Some Aspects of Hydrodynamic Loads and Structural Strength Assessment of Ships*. Seref discussed some aspects of hydrodynamic loads and the structural strength assessment of ships. The methods of determining the hydrodynamic loads and responses and some of the available tools were presented. These included a variety of theoretical and numerical prediction techniques providing a broad spectrum of solution methods from static to dynamic analyses, full-scale trials and structure-scale model experiments. The numerical dynamic response analysis technique was discussed along with the traditional strength assessment which is based on a quasi-static loading (hogging and sagging) approach. Hydroelasticity, one of the dynamic strength assessment tools, is considered to provide a good representation of the fluid-structure interactions by treating the ship as a flexible structure. Several applications of the hyroelasticity theory including slamming were presented.

Stuart Cannon

Queensland

The Section committee met on 4 December 2001 at the Yeronga Institute of TAFE in Brisbane with teleconferencing to committee members in Cairns. Matters concerning a state register of naval architects and boatbuilders were discussed in detail and resulted in a new direction being agreed. Also the distribution of correspondence to members by email was discussed. Advice will be requested in due course from all section members concerning their preference for email or normal post.

The Section quarterly technical meeting was also held on 4 December following the Section committee meeting. This was an extremely well attended meeting with teleconferencing to Cairns. Werner Bundschuh introduced Paul MacGillivary, Projects Manager from the Secretariat of the National Marine Safety Committee. Paul provided an update on the development of the new National standard for Commercial Vessels titled *Safety Obligations and Opportunities* and, with the assistance from Werner, outlined the philosophy underpinning the national standard development and its present status. Prints of the Powerpoint slides used in his presentation can be obtained from the Section Secretary.

Brian Robson

ACT

On the evening of 14 November IMarEST (in conjunction with IEAust and RINA) arranged a technical meeting on *Roller Bearing Developments, Innovations and Benefits* at the National Press Club. The presentation was given by Mr Ross Lee, National Product Manager of NTN-CBC Australia Pty Ltd, Mr Ken Nakamura, Technical Director of NTN-CBC Australia Pty Ltd and Mr Gordon McClure of CBC (NSW) Pty Ltd.

NTN Corporation, established in 1918, is the third largest bearing manufacturer worldwide. It produces some 800 million bearings per annum, or around 9% of the world market. Consolidated Bearings Company (CBC) was established in 1954 and now has some 62 branches and 550 staff in Australia. NTN-CBC is a 50/50 joint venture company.

The presentation covered some of the developments in bearing design to extend bearing life and allow them to operate with little maintenance under the more adverse operating environments found in some industrial and marine environments. These developments related to surface treatment of the bearing materials, the design of the bearing seals and the bearing lubricant materials employed. A number of the NTN product lines were discussed, ranging from various types of bearings, through grease lubricants to constant velocity joints. The presenters left little doubt about their knowledge of the application of bearings across a range of industries.

Following the presentation on roller bearings, an informal dinner had been arranged with the visiting IMarE Director General, Mr Keith Read, at The Column restaurant of the National Press Club. This gave time for those attending to reminisce over some old tales. Thanks to Greg Hellessey of IMarEST for arranging the meeting and dinner.

Martin Grimm

Western Australia

Ten technical meetings were held during 2001, with attendance ranging from a select dozen to the high fifties. They were usually held jointly with IMarEST on the third Wednesday of the month at the Flying Angel Club, Fremantle. One notable exception was the AGM, held on board the Austal catamaran *Euroferrys*.

The program for 2002 is already well developed, with responsibility for meetings alternating with IMarEST. The AGM is scheduled for 19 February. In addition to the regular technical meetings, plans are under way to hold a mini-conference in conjunction with the Ausmarine West conference and exhibition at the end of October 2002.

Towards the ends of 2001 work started on establishing a professional development program for graduate naval architects in WA. It is hoped to progress this during 2002 with a view to RINA and academic accreditation. Meanwhile, recruitment efforts continue through our extensive social and technical program, advertised regularly by hardcopy, email and through the comprehensive and up-to-date WA Section of the RINA website

The RINA WA library has been catalogued and upgraded by John Wood — a herculean task. We have several hundred references stored under lock and key at the Flying Angel Club, which are available on loan to members. The catalogue is being computer indexed and will be distributed to members electronically during 2002.

Around the last Friday of every other month we have met after work at the Norfolk Hotel, Fremantle, to discuss the finer points of fluid dynamics. These informal gatherings will continue in 2002. On Sunday 21 October a dozen participants designed, built, launched and in some cases propelled, a balsa wood vessel carrying a beer can across a stretch of water - the inaugural RINA Beer Can Challenge. This highly successful event, organised by Steve Harler, will be revisited in 2002.

A big thank you to all the committee members for their contributions in what turned out to be a very busy and productive year. Particular thanks go to our Secretary, Jim Black, who bears the brunt of the workload.

Kim Klaka

The WA Beer Can Challenge

The inaugural WA *Beer Can Challenge* was held on Sunday 21 October. For the uninitiated, the Beer Can Challenge is an event where teams of naval architects (and friends) each receive a small balsa wood kit, a tube of glue, a couple of elastic bands and a few other useful bits and pieces. The challenge is to turn the kit into a marine craft that carries a beer can as far as possible.

The event proved most successful. After some nervousness regarding the overcast weather, four teams accepted the challenge at the University of Western Australia Boat Club. Following a flurry of boat building (and a few generous time extensions), four vessels of varying configurations emerged. All four vessels were of very different forms, with the only consistency throughout being that all the vessels had at least two hulls!

Briefly the vessels could be described as follows:

- a sailing catamaran, utilising the beer can as ballast (the plastic bag and the balsa were fashioned into a sail) made by Jim Black's Team.
- a simple V form catamaran powered by a paddle wheel between the hulls constructed by Kayne Binks' Team.
- a catamaran hull form with a propeller drive and adjustable rudder by Ken Goh's Team.
- a trimaran hull form utilising the potential energy from suspending the beer can above the craft by Kim Klaka's Team.

After a quick barbecue lunch the competition stage of the day began. Each team was given the opportunity to make two runs along a course marked parallel with the Swan River shoreline (one in each direction). With such a wide variety of well constructed entries, and quite choppy conditions on the water, the judges had great difficulty declaring an outright winner. Ultimately, recognition was given in the following categories:

Furthest distance travelled overall — Equal first Kayne Binks Team and Jim Black's Team

Best constructed vessel — Ken Goh's Team

Most novel propulsion system — Kim Klaka's Team

The event was a resounding success with all involved keen to repeat the event. We thank the UWA Boat Club for providing excellent facilities of the event. Planning for the 2002 Beer Can Challenge is well advanced, and will be run on Sunday 24 March 2002. We look forward to seeing you all there!

Steve Harler
WA Beer Can Coordinator
[This must surely be a uniquely Australian event —Ed.]

New South Wales

The NSW Section Committee met on 15 November and, other than routine matters, discussed:

- SMIX Bash 2001 (some sponsorship money received, more pledged, but more needed; venue confirmed for 200 guests);
- Technical meeting program for 2002 (six papers proposed, and authors to be contacted);
- Technical meeting venue for 2002 (IEAust Harricks Auditorium has been confirmed); and
- Budget 2002 (total of $1560 agreed; to be advised to Australian Division).

The NSW Section Committee also met on 29 January in conjunction with Pacific 2002 with the Chief Executive, Trevor Blakeley, in attendance and, other than routine matters, discussed:

- SMIX Bash 2001 (two sponsorships still to be received, but projections are for a loss of $80 on the event; decision on further events to be made);
- Technical meeting program 2002 (eight out of nine presentations arranged; one RINA pending);
- Committee for 2002 (members present expressed willingness to continue in present positions; others to

be checked);
- Walter Atkinson Award for 2001 (presentations/papers limited by non-membership; six possible contenders in NSW); and
- Ship visits in 2002 (several possible visits to be investigated).

Following the RINA Committee meeting in conjunction with Pacific 2002, committee members Bob Dummett, Graham Taylor and Phil Helmore took the Chief Executive, Trevor Blakeley, to dinner at the Coast restaurant on the roof terrace which overlooks Cockle Bay at Darling Harbour.

The second SMIX (Sydney Marine Industry Christmas) Bash was held on Thursday 6 December aboard the beautifully-restored *James Craig* alongside Wharf 7, Darling Harbour, from 1730 to 2130. The Bash was organised jointly by the IMarEST (Sydney Branch) and RINA (NSW Section). About 181 guests came from the full spectrum of the marine industry, including naval architects, marine engineers, drafters, boatbuilders, machinery and equipment suppliers, regulators, classifiers, surveyors, operators, managers, pilots, navigators, researchers, and educators. Equally importantly, the full spectrum of age groups was represented, from present students to the elders of the marine community.

Sydney turned on a beautiful evening, after the storm earlier in the week, and many partners in attendance enjoyed the view from the decks of *James Craig*. Drinks (beer, champagne, wine and soft drinks) and finger food (chicken kebabs, sausage rolls, pies, and mini pizzas) were provided, and many tall tales and true were told. A bonus was the presence of the Volvo Ocean Race yachts, which had arrived two days previously and were parked (i.e. on the hard, as opposed to moored) in various places in the Sydney Stopover Village, adjacent to Wharf 7. The high aspect-ratio keels and the ballast bulbs on these vessels have to be seen to be believed!

Formalities were limited to two short speeches, one from the Chair of the NSW Section of RINA, Bob Dumett, who welcomed the guests and thanked the industry sponsors, and one from the Chair of the Sydney Branch of the IMarEST, Len Michaels, who presented the Institute's Stanley Gray Award for 2000 to Ian Williams for his paper on *Improvement in the Safety of Passenger Vessels*, which was presented to a joint meeting of IMarEST (Sydney)/RINA (NSW) on 26 April 2000. The award is for the best presentation made at any of the IMarEST's international branches, and so the award to the Sydney Branch's nomination is no mean feat. Congratulations Ian!

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

- Energy Power Systems
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- American Bureau of Shipping
- Bureau Veritas
- International Paints
- Lloyd's Register of Shipping
- Wartsila
- Defence Maritime Services
- Withnell Hetherington
- Headland Engineering
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- Intercontinental Ship Management
- Dilman Navigation
- MAN B&W
- Cummins
- Incat Designs
- Captain Cook Cruises
- Storey and Keers
- Halliday Engineering

Our thanks to them for their generosity and support of SMIX Bash 2001.

Some of the stayers, who were shown the gangplank late in the peace, rocked on to the Star City Casino across the road and continued to party until the wee small hours.

SMIX Bash 2001 on board *James Craig*
(Photo courtesy Ben Hercus)

RINA had a stand at the Pacific 2002 International Maritime Exhibition, and this stand was crewed continuously by members of the NSW Section of RINA. The Chief Executive of RINA, Trevor Blakeley, and the Group Advertisement Manager, Debbi Bonner, were also present from time to time for expert advice. Many thanks to crew Todd Maybury, Don Gillies, Rod Humphrey, Allan Soars, Phil Helmore and, especially, Bob Dummett who, in addition to crewing, set up on Monday with Trevor Blakeley, and single-handedly packed up on Friday.

Phil Helmore

RINA Members!

The ANA is your Journal, and relies on your input. If you know of some interesting news, let the editors know; don't assume that, because you know, everyone else does too.

The editors can only publish what they receive or generate, so the more contributions the better to maintain the Australia-wide coverage.

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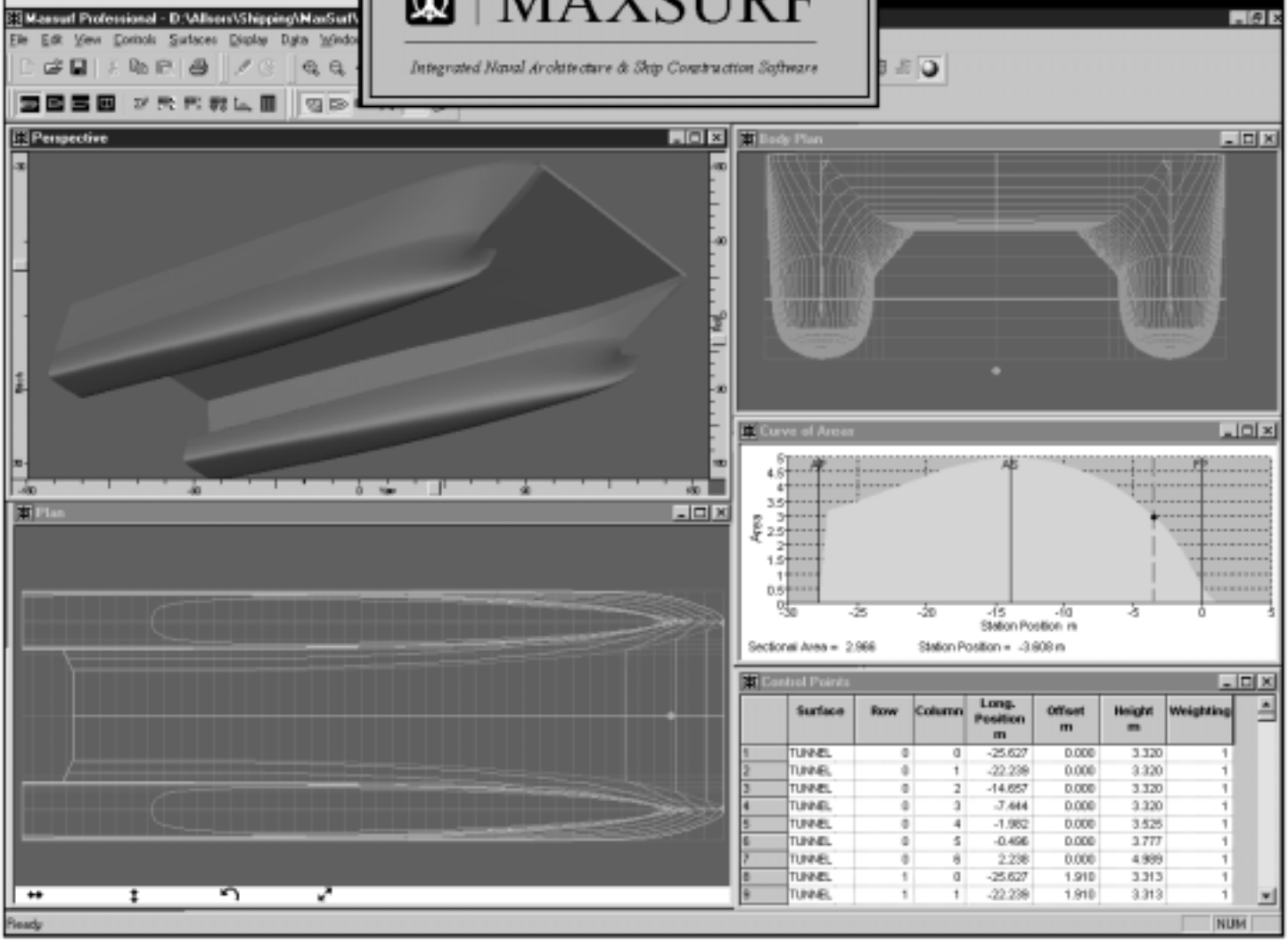

COMING EVENTS

Australian Division AGM

The Annual General Meeting of the Australian Division of RINA will be held on Wednesday 27 March immediately following the scheduled technical meeting of RINA (NSW Section) and IMarEST (Sydney Branch) at 5:30 for 6:00 pm in the Harricks Auditorium at the Institution of Engineers, Australia, 118 Alfred St, North Sydney; see notice elsewhere in this issue and separate notice mailed to members with this issue.

NSW Section AGM and Technical Meetings

The Annual General Meeting of the NSW Section of RINA will be held on Wednesday 27 March immediately following the AGM of the Australian Division of RINA which, in turn, follows the scheduled technical meeting of RINA (NSW Section) and IMarEST (Sydney Branch) at 5:30 for 6:00 pm in the Harricks Auditorium at the Institution of Engineers, Australia, 118 Alfred St, North Sydney; see notice mailed to NSW members with this issue.

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 for 2002 (with exceptions noted) is as follows:

27 Feb	Adrian Broadbent, Lloyd's Register, *The Developing Relationship between Classification Societies and the Navies*
27 Mar	Graeme Peterson, Teekay Shipping, *Shipping Safety*
17 Apr	(third Wednesday) Rob Gehling, AMSA, *Prevention of Pollution by Oil Tankers — Can we improve on double hulls?*
29 May	(fifth Wednesday) TBA
26 Jun	Glen Ellis, ADI Garden Island, *Support Management for the Minehunter Project*
31 Jul	(fifth Wednesday) Dick den Brinken, Botany Bay Shipping Group, *The Impact of the ISM Code*
28 Aug	Graeme Hunter, Rolls Royce, *The Electric Ship*
23 Sep	(fourth Monday) Mori Flapan, NMSC, *The Fast Craft Section of the new National Standard for Commercial Vessels*
23 Oct	Lina Diaz, Waterways Authority, *Lines Lifting using Photogrammetry*
5 Dec	SMIX Bash 2002

The new venue is convenient to all public transport at North Sydney. There is parking available in the area, and free motorcycle parking almost at the front door!

ACT Section Annual Dinner

The RINA/IMarEST Canberra joint annual dinner is proposed for early in 2002, and is awaiting further planning between RINA and IMarEST Section committees. When details have been finalised they will be circulated to local members.

Victorian Section Technical Meetings

All technical meetings are held on the third Tuesday of the month from 1800 at the Institution of Engineers, 21 Bedford Street, North Melbourne.

19 Feb	Andy McNeill — *Introduction to Reliability Centred Maintenance — Applications and Examples.*
19 Mar	Visit to the Port Control Offices — details to be forwarded in MEV news.
16 Apr	Matthew Gudze — *Structural Deterioration Modelling issues for Reliability Based Management of Surface Naval Ships*.

Western Australia Section

The program for 2002 will start with the Annual General Meeting on 19 February at the Fremantle Sailing Club, Philippe Peche of International Sailforce will speak on *High Speed Multihull Sailing*.

Philippe is one of the world's most successful multihull offshore racing crew, currently ranked equal second in the Fico-LaCoste world short-handed sailing crew rankings. He will relate his experiences in events such as The Millenium Race on board the 33.3 m catamaran *Team Adventure* (in which he sailed round the world in 83 days) and the transatlantic Challenge Mondial Assistance with Ellen Macarthur on board the winning 18.2 m trimaran *Foncia*. Phillipe will also present his latest plans for two 7.6 m racing catamarans which he has recently brought to Fremantle and will present some video footage. Visit www.thesailforce.com for more details.

Asia Pacific Maritime Congress

The Asia Pacific Maritime Congress is being organized by the Kansai Society of Naval Architects of Japan, and is planned as the 90th Anniversary of KSNAJ. Three concurrent symposia will be held from Tuesday 21 May to Thursday 23 May 2002 at the congress:

The Third Conference for New Ship and Marine Technology (New S-Tech) will cover the wide range of research fields such as naval architecture, ocean engineering, shipping technology and history, marine structures and materials, marine management, port control, and marine environments. Further details from the website www.ksnaj.or.jp/apmc/newstech.pdf.

The Sixteenth Asia Pacific Technical Exchange and Advisory Meeting on Marine Structures (TEAM'02) will provide the opportunity of exchanging recent research results and new

ideas and also of propmoting discussion of researchers and engineers of ship and marine structures. Further details from the website www.ksnaj.or.jp/apmc/team.html.

The Asia Pacific Workshop on Marine Hydrodynamics (AP Hydro) will be the extended workshop of the JAKOM/ KOJAM to encourage researchers, particularly junior people including graduate students. Any aspect of hydrodynamics, ocean engineering or marine environments is welcome. Further details from the website www.ksnaj.or.jp/apmc/ aphydro.html.

Pan-Asia Maritime Forum

In association with the Asia Pacific Maritime Congress, a round-table discussion will be held on Wednesday 22 May 2002 regarding the formation of a new association of the societies of maritime engineering in Asia, Australia and New Zealand. Attendance at the forum is by invitation (to the societies, not individuals) only. The intention is for a loose association of the various maritime engineering societies in the region, with the primary purpose of organising conferences, symposia, etc. say every two or three years, focusing on the interchange of ideas.

RINA has been invited, and the Division Council would therefore be interested to hear from any member who expects to attend the Congress and could carry the Division flag at the Forum. Please contact the President, Bryan Chapman by phone on (03) 9857 9011 or email navarch@ozemail.com.au.

THE ROYAL INSTITUTION OF NAVAL ARCHITECTS AUSTRALIAN DIVISION

ANNUAL GENERAL MEETING

Notice is hereby given that the Annual General Meeting of the Australian Division of the Royal Institution of Naval Architects will be held in the Harricks Auditorium of the Institution of Engineers, Australia, Eagle House, 118 Alfred Street, Milsons Point NSW on Wednesday, 27 March 2002. The meeting will commence immediately following the combined RINA/IMarEST Technical Meeting commencing at 5.30 pm for 6.00 pm Sydney Time.

AGENDA

1. Opening
2. Apologies
3. To confirm the Minutes of the AGM held in Sydney on Wednesday 28 March 2001
4. To receive the President's Report
5. To receive, consider and adopt the Financial Statements and Auditor's Report for the year ending 31 December 2001
6. Announcement of appointments to the Australian Division Council
7. Other Business

By Order of the Council
Keith M Adams
Secretary

February 2002

GENERAL NEWS

Austal Secures Contract with US Military

Austal announced on 31 January 2002 a major break-through in the use of fast ferry technology, securing a three-year contract with Military Sealift Command of the United States Military for the 101 m high speed Theatre Support Vessel, *WestPac Express*.

This is the first time the US Military has contracted a commercial vessel of this type for military support. *WestPac Express* will be used for operations supporting the Third Marine Expeditionary Force (III MEF) of the United States Marine Corps.

The three-year contract follows an extensive trial of the vessel during a 'proof of concept' charter period entered into between Austal and the US Military in July 2001.

Austal's Managing Director, Mr Bob McKinnon, said Austal won the contract over bids from major competitors.

'This contract has opened the door for Austal to take a leadership position in supplying vessels for the military market,' he said.

'Our decision to establish a modern shipyard in Alabama in the United States enables Austal to take full advantage of further US Military orders that could be expected to flow from this contract.

'The US Military extensively tested our vessel and compared it to others, clearly demonstrating that *WestPac Express* is the preferred logistics solution for the III MEF's requirements.'

Mr McKinnon said Austal had made arrangements to sell *WestPac Express* to a financier. The vessel is to be chartered from the financier for the contract with the United States Military.

Austal has been focusing extensively on developing vessels for military use, recognising the superior applications high speed ferries provide to move large numbers of troops and support vehicles in one lift, compared to many movements with traditional vessels or aircraft.

The vessel has consistently exceeded the expectations of the US Marine Corps, demonstrating the effectiveness of Austal's high-speed theatre-support vessel for the rapid deployment of troops and equipment.

Lt. General Gregson, Commander of the III MEF in Okinawa said '*WestPac Express* had fulfilled the US Marines' expectations.

'We are pleased to continue our relationship with Austal and take full advantage of the benefits offered to III MEF by this outstanding vessel,' Lt. General Gregson said.

WestPac Express enables III MEF to rapidly transport a complete battalion of more than 950 marines together with up to 550 t of vehicles and equipment, in one lift, delivering considerable strategic and cost advantages.

During the term of the charter the vessel will continue to transport marine battalions, vehicles and equipment between the III MEF base at Okinawa and other ports in Japan and the Western Pacific region.

WestPac Express will be re-flagged in the United States during the course of the contract, establishing a benchmark as the first commercial vessel of this type to be registered and flagged in the United States.

Incat Sells a New Ship to Canada's Bay Ferries

Canadian company Bay Ferries has placed an order for their second vessel built by Incat Tasmania Pty Ltd. The new 98 m fast catamaran is in its final stages of construction in the Coverdales building hall at the Incat shipyard, Hobart. The new ship will start service on the international route between Yarmouth in Canada and Bar Harbor in the United States in May this year.

Bay Ferries President, Mr Mitchell McLean, and his team visited Hobart for the signing of the contract. Mr McLean said, 'I am impressed with the increased carrying capacity achieved with the 98 m ship. It will allow us to carry heavy freight, more coaches and recreational vehicles than we were able to with our earlier Incat vessel. The new ship offers our passengers a luxurious and comfortable ride. That combination means we will be able to broaden our customer base for increased revenue.

Our purchase is a confirmed vote of confidence in the Incat product considering that last season we operated with 98% on time and 84% total customer satisfaction.'

With its distinctive 'Blue Cat' livery, the 98 m fast catamaran is 11 m longer on the waterline than Bay Ferries' 91 m Incat-built vessel and offers 50% more deadweight.

Blue Cat will carry 900 passengers and 267 cars, or a lesser number of cars plus heavy freight vehicles; an increase of 11% in car capacity and a huge increase in freight capacity.

Incat's yard number 059 has all major propulsion equipment installed, and interior fit out is well underway. *Blue Cat* is due to be launched on 27 February and sea trials will be in late March, with departure for Canada around Easter to take up service on the 110 n mile route across the Bay of Fundy immediately after arrival at her new home.

Blue Cat
(Image courtesy Incat)

The Cat completes record Canada — Australia passage

A new record for the fastest sea passage between Canada's East Coast and Australia has been established by the 91 m Incat-built wave-piercing catamaran *The Cat*.

The Cat set out on her 10 294 n miles passage to Hobart, Tasmania from Nova Scotia's Bay of Fundy at 0630 GMT on 13 November 2001. Just 15 days, two hours and 30 minutes later the craft was safely alongside at Incat's shipyard in Hobart.

The first leg of the voyage, a distance of 2 238 n miles averaging an impressive 37.5 kn, was completed on 15 November when *The Cat* arrived at the Panama Canal. The next stage of the voyage, 4 500 n miles at an average speed of 26.47 kn, was accomplished when the craft arrived at Tahiti on 23 November.

The third and final leg from Tahiti to Hobart, a distance of 3 556 n miles, placed *The Cat* in Hobart at 0900 GMT (2000 local) on 28 November 2001, beating all previous passages between Canada and Tasmania.

Since *The Cat* started making the twice-yearly journey in 1998, the typical time taken has been around 20 days. Each year since her delivery to Canada in 1998, *The Cat* has been chartered to TT Line by her owners, Bay Ferries of Nova Scotia, for the southern hemisphere summer season on Australia's Bass Strait.

The Cat
(Photo courtesy Incat Australia)

Austal Launches Ferries for Portugal

Austal Ships has recently launched the first of two new river catamarans for Portuguese ferry operator Transtejo.

Image Marine, a division of Austal Ships, constructed the two river catamarans.

The vessels mark the first sale to the region by the Australian high-speed ferry industry and will join a fleet of around 50 vessels operated by Transtejo.

Designed for commuter comfort and fast turn-around times, the 37 m River Cats can carry 292 passengers at approximately 30 kn and will provide transport between the ports of Parque Das Nações and Barriero on the River Tejo in Lisbon.

New Era for Marine Safety in Victoria

The Victorian Minister for Ports, Candy Broad, launched a new authority on 6 February — Marine Safety Victoria — to oversee and manage the safety of Victorian waters.

'The creation of this new authority will ensure improved arrangements to manage marine safety in Victorian waters,' Ms Broad said.

'Marine Safety Victoria will continue the excellent work done by the Marine Board of Victoria since its inception in 1888.

'The new organisation's name demonstrates the Bracks Government's strong commitment to promoting and achieving safety outcomes for Victorian waters. It clearly communicates the role of the new authority to the public.'

Marine Safety Victoria will take over the powers and functions of the Marine Board Victoria. Legislation passed by Parliament last year also gives the new Director increased powers to improve and streamline the administration of marine safety.

'To better protect the environment for future generations, the Director's powers have been strengthened to effectively respond to marine pollution incidents in Victorian waters,' Ms Broad said.

'For example, the definition of marine pollution now includes

oil, chemicals and other noxious spills, in line with national objectives.'

She said Marine Safety Victoria had also been given improved powers to investigate marine incidents involving vessels in Victorian waters and to make public any findings from those investigations.

Marine Safety Victoria will also have a key role in the promotion of safety and education for operators and users of commercial and recreational vessels.

Ms Broad recognised and acknowledged the long and distinguished role played by the former Marine Board in improving marine safety in Victoria.

'The work by the former board has given a strong grounding for Marine Safety Victoria to be able to move confidently into the future, and I thank the former directors and staff of the Board for their dedicated and professional work towards marine safety objectives,' Ms Broad said.

Mr John Lord AM, former Chief Executive of the Marine Board, has been appointed as the first Director of Marine Safety Victoria.

Tenix wins Phillipines Order

The go-ahead has been given for construction of six new search and rescue vessels for the Philippines Coast Guard by the Australian company Tenix Defence.

Tenix will build two 56 m search and rescue vessels and four 35 m high-speed search and rescue vessels for the Coast Guard, with an option for ten more 35 m vessels, under a contract worth up to $US150 million.

Tenix Defence built two previous 56 m vessels for the Philippines at its yard at Henderson in Western Australia, where the new vessels will also be built. These first vessels were delivered in June and December 2000.

ANZ Investment Bank arranged buyer finance for the contract with export credit support provided by Export Finance and Insurance Corporation (EFIC), Australia's official export credit agency. BNP Paribas and Societe Generale joined the financing as co-arrangers.

Tenix Defence has designed and built 35 similar craft, now in service in the South Pacific, Hong Kong and Kuwait. It currently manages the in-service support of 22 of those vessels.

New Motor Yacht Order for Oceanfast

Austal Limited announced in November that its motor yacht subsidiary, Oceanfast, has secured a new order for a 52 m luxury motor yacht. Whilst the value of the contract is confidential, it is likely to be between $A35–50 million. The luxury motor yacht will be built for a new Oceanfast customer and the order took the total value of vessels on order for Oceanfast to approximately $200 million.

The 52 m vessel will feature a unique high-speed aluminium hull design. Due for delivery towards the end of 2003, the yacht joins three other vessels currently under construction at Oceanfast's extensive new waterfront facilities. They include the 69.5 m expedition yacht, *Aussie Rules,* for golfer Greg Norman, a 54 m steel displacement-hull motor yacht and 56.5 m steel displacement-hull motor yacht.

Oceanfast has produced 16 luxury motor yachts for customers worldwide and was recently awarded the prestigious Large Manufacturers Award at the 2001 Western Australian Industry and Export Awards.

Yarra launched

The sixth and final Huon class minehunter, *Yarra*, was launched at ADI's Carrington Shipyard in Newcastle last month.

The Minister Assisting the Minister for Defence, Mrs Danna Vale, said the Minehunter Coastal Project would deliver world-class mine countermeasures capabilities to the Navy. These capabilities include mine search, location, classification, identification and clearance in deep water using variable depth sonar, remotely operated vehicles and clearance divers, and mine clearance using Australian-designed minesweeping equipment.

The fifth ship in the class, *Diamantina,* was due to be delivered to the Navy at the end of January 2002. ADI plans to deliver *Yarra* to the Navy in September 2002. Australian industry involvement in the project had resulted in expenditure of more than $630 million, with over 2 000 Australian companies involved.

Yarra was launched by Mrs Sylvia Merson, wife of Commodore J. L. Merson, OAM (Retd). Commodore Merson was the first commanding officer of the third HMAS *Yarra* on her commissioning in 1961.

The first four minehunters, *Huon, Hawkesbury, Norman* and *Gascoyne,* have been commissioned into the Royal Australian Navy and are based at HMAS *Waterhen* in Sydney. The new *Yarra* is the fourth ship to bear that name in RAN service.

ASC Changes

Late last year the Commonwealth announced important changes relating to the future of the Australian Submarine Corporation.

These decisions follow from the Federal Government's announcement that ASC will provide the through-life support for the Collins-class submarines.

While it remains the Government's intention to sell its shares in the Australian Submarine Corporation, this will not be proceeded with for the time being.

In the meantime, the Government will concentrate on a number of critical issues including:

- negotiation of the detailed commercial arrangements with ASC to meet the Government's commitments on the strengthening of ASC's capability to provide this service;
- negotiation and conclusion of arrangements for the introduction into ASC of General Dynamics/Electric Boat Corporation as a capability partner; and
- resolving intellectual property and design authority issues necessary to this through-life support.

A spokesman said these decisions should be seen as a further commitment by the Government to ASC in the critical role it will play in relation to a sustainable submarine capability in general and the through-life support of the Collins class in particular.

Successful Completion of *Joint Venture* Helo Trials

Incat Australia announced in February that two variants of the United States Navy 60 Series helicopter have successfully completed operational rating on board *Joint Venture*, the Incat-built 96 m wave-piercing sealift catamaran

The dynamic interface trials were conducted under the coordinating efforts of the US Navy Warfare Development Command (NWDC) which is responsible for the Joint High Speed Vessel Experimentation Project. Over two consecutive days, the Naval Rotary Wing Ship Suitability Office conducted some 24 separate take offs and landings, twelve of which utilised the monitoring helicopter containing the trial data and equipment.

All flight operations were successfully executed as *Joint Venture* maintained 36 kn (ship speed) with 57 kn apparent wind speed across the helo deck. Andrew Baker, Flight Test Engineer for Dynamic Interface/Rotary Wing Ship Suitability NAWCAD-PAX, commented; 'The test was extremely successful. The general launch and recovery envelopes for the MH-60S, UH-60A/L/K and CH-46 helicopters were verified. *Joint Venture*'s crew was very professional, providing all the support we could possibly ask for. Mother Nature was helpful as well, supplying winds which were nearly perfect for testing.'

Chock and chain procedures, comprising landing on deck, chaining down the aircraft with tie downs, and chocking of wheels were also successfully completed.

Flight Operations were satisfied with the trial and believe it could well be the fastest high-speed helicopter landing in US Defense history. 'Using only two test aircraft (the NSH-60B and MH-60S) and limited test time, we were able to complete a very generous Expanded Launch and Recovery Envelope for the H-60B/F/H/J in near record time', Baker said.

For her role with the US military, *Joint Venture* has been fitted with a helicopter deck capable of accommodating large military helicopters such as the SH-60 Seahawk and the CH-46 Sea Knight, a world first for high-speed craft. The 472 m^2 helo deck has been designed by Incat's Hobart-based design team to meet military specifications.

'The certification of the flight deck to operate US Navy helicopters marks a significant milestone in the experimentation program,' said Commander Dean Chase USN, the NWDC project officer. 'The addition of an aviation dimension to the high-speed vessel greatly expands its flexibility and utility for a wide spectrum of operations.

Joint Venture is the first high-speed craft to go into service with the United States military forces in continental America. Formerly known as *Incat 050*, the new name *Joint Venture* is in recognition of the partnership of component commands from the US Navy, Army, Marine Corps, US Special Operations Command and Coast Guard. Together, the US military sectors will explore the operational implications and opportunities of new marine technologies that are bringing higher speeds, longer ranges and increased payload capacities to surface vessels.

The military deployment of an Incat Wave-piercing Catamaran is the first major project undertaken by Bollinger/ Incat USA, the strategic alliance formed last year between Bollinger Shipyards Inc. of Louisiana, USA and Incat Australia Pty Ltd.

Helicopter operations on *Joint Venture*
(Photo courtesy Incat Australia)

Gaul Contract Awarded

Aberdeen-based Halliburton Subsea has won the £2 million contract for the second underwater survey of the trawler *Gaul* which sank in 1974 with the loss of 36 lives, writes Sandra Speares.

This latest survey of the wreck of *Gaul*, expected to take place next summer, is intended to supplement the work of an initial survey carried out under the auspices of the Marine Accident Investigation Branch in 1998. It led to the re-opening of the formal investigation into the loss of the stern trawler off the North Cape in the Barents Sea.

According to the Department of Transport, Local Government and the Regions, the survey will 'seek to remove any lingering doubts about the fate of *Gaul'*.

Unsubstantiated rumours have abounded in the years since her loss at the height of the Cold War, including that she was involved in an anti-Soviet intelligence mission and that the crew had been captured by the Soviets.

The survey will concentrate on obtaining further photographic evidence to explain the loss of the ship, search for forensic samples in order to establish identity using DNA profiling, and for evidence in connection with allegations that *Gaul* was involved in intelligence gathering. Shipping minister David Jamieson said that he agreed with the Deputy Prime Minister, John Prescott, who has ruled out a manned dive on the ship on safety grounds. The survey will also attempt to develop a strategy for entering the vessel.

'The first aim of the survey will be to collect video images that explain the loss of the vessel before work begins on the other objectives which require the evidence to be disturbed,'

Mr Jamieson said. 'I very much hope that the survey will help the re-opened formal investigation reach firm conclusions concerning the loss of *Gaul* and her crew because there should be no expectation of a further return to the wreck.'

The MAIB report into the loss of *Gaul*, published following the first underwater survey concluded that the ship had been sunk following downflooding through open weathertight doors and hatches on her trawl deck, after being knocked down by large breaking waves. No bodies were ever recovered from the ship and DNA testing in 1999 on bodies washed ashore in Murmansk following the accident found they were not members of *Gaul's* crew.

Lloyds List, 17 December 2001

Queensland Industry News

For the last three months JLMD Gold Coast Naval Architects has been busy with several conversion and alteration projects. These have included the conversion of a 50 m hopper barge to container shuttle, the lengthening and widening of a 10 m aluminium fast fishing boat, and the lengthening and re-powering of a charter fishing catamaran.

The catamaran, which has just returned to service, was an interesting challenge. It started life as a 10 m stern-drive powered boat with a passenger capacity of 12 and a maximum speed of about 15 kn. The owners wanted to increase the passenger capacity to 22 (Class 1C) and increase speed with the installation of new engines and shaft drives. As the boat operates through a shallow and shifting bar, draught was severely restricted and propeller protection was required. The resulting design for the conversion included lengthening the vessel by 2 m, providing for semi-recessed propellers incorporating skegs forward of the propellers and ensuring that the boat would meet one-compartment damaged stability standards. Trials have proved very satisfactory, with a full load speed of 22 kn being achieved. The propeller protection has also been (inadvertently?) tested and found to be most successful.

Brian Robson

WA Industry News

In addition to the orders reported above, Tenix have also just confirmed an order for a 23 m longline fishing boat, to a design by Rob Williams.

SBF Shipbuilders plan to put on an extra 50–60 staff after winning contracts worth up to $54 million to build six to eight ferries for two Greek buyers. Geomar Enterprises (Piraeus) have ordered two 40 m high-speed monohull ferries to carry about 230 passengers each and had an option to order another two identical vessels. The second order was with another Greek ferry operator for four 45 m high-speed monohull ferries to carry about 250 passengers plus 6 cars and a bus and was worth about $29 million over the next two years.

A 12 m hydrofoil catamaran with twin rigs was due to hit the water in mid-January. It has been designed by By Design Group (BDG) (www.bydesign.com.au) and built by Windrush Yachts. It bears a passing resemblance to the Team Phillips boat built in the UK, though hopefully it will not suffer the same sad fate. BDG Director Mark Pivac expects the boat to become foil borne 'somewhere between 6 and 14 kn'. A prediction of 8 kn was made, based on very successful experience they have had with a foil-borne International Moth class craft. Rumour has it that Philippe and Marc will challenge one another for a record or two — the Fremantle to Rottnest sailing record, perhaps? Watch this space.

Kim Klaka

NSW Industry News

New Design

Incat Designs continues to be busy with new projects materialising from their licensed yards in the United States. Gladding Hearn have received contracts for four new vessels for Hy-Line Cruises, two new vessels for Boston Harbor Cruises, and one more for Seastreak USA. Details of the designs will be forthcoming.

Crowther Multihulls, in concert with Richardson Devine Marine in Hobart, have recently signed contracts for three new vessels:

- A 25 m, 24 passenger, 30 kn tourist catamaran for a Mediterranean owner. The vessel will be powered by twin MTU engines of 1050 kW and ZF gearboxes, and will feature twin decks, wing control stations, skylights and full-height windows.
- A 25 m vessel for Port Arthur, Tasmania, to seat 184 passengers on two decks. The vessel will operate in dual roles: ferrying tourists on short trips at slow speed around Port Arthur, and taking long, high-speed offshore runs to and from Hobart, as well as operating in the harbour at Hobart. The vessel will be powered by twin Caterpillar 3406 engines and Twin Disc 5114 gearboxes for a speed of 24 kn.
- A 17 m, 100 passenger, 4 crew, 25 kn vessel for operation on Westernport Bay. This vessel is modelled on their earlier 16 m vessel, *George Bass*, operating at Phillip Island. The vessel will be powered by twin Cummins 6CTA 8.3M engines rated at 235 kW and Twin Disc 5061 gearboxes.

Work Boat World, January 2002

New Construction

Gladding Hearn recently delivered the second Incat-designed Seastreak vessel, *Seastreak New Jersey*. This vessel performed successfully on trials at the shipyard before making its delivery voyage down Long Island Sound to a naming ceremony in New York City. The vessel will operate alongside its sistership, *Seastreak New York*, delivered in March last year, from Atlantic Highland, New Jersey, to Wall St and East 34th St in downtown New York.

Principal particulars of *Seastreak New Jersey* are as follows:

Length OA	42.90 m
Beam	10.43 m
Draught	1.96 m
Main Engines	4 x Cummins KTA 50
Power	4 x 1398 kW
Gearboxes	4 x Reintjes WVS 730

Waterjets	4 x KaMeWa A50
Speed	38.5 kn
Seating	400 x Turnball Interior and Exterior Seats
Construction	Aluminium

Seastreak New Jersey Arriving in New York
(Photo courtesy Incat Designs)

Nichols Bros. have now completed their backlog of orders with the recent delivery of the Incat-designed *Peralta* to the City of Alameda on San Francisco Bay. The vessel is a 35 m propeller-driven vessel and will operate on the relatively short crossing to Oakland and Alameda from San Francisco.

Peralta on Trials
(Photo courtesy Incat Designs)

Nichols Bros have also recently delivered *Vallejo*, which undertook a major refit. The vessel was built as the Incat-designed *Jetcat Express* by Gladding Hearn in 1988 and was originally operated by Catalina Express before the City of Vallejo, California, took over the vessel. The vessel was totally stripped back, lengthened and re-engined with MTU 12V 4000 engines and Hamilton waterjets to give a new service speed of 33 knots. A new wheelhouse was added to the upper deck and the interior was totally rejuvenated. The vessel will continue in its role as a backup to the current two-boat fleet operated by the City of Vallejo. Principal particulars following the refit and lengthening are as follows:

Length OA	44.00 m
Beam	10.00 m
Draught	1.65 m
Main Engines	2 x Cummins KTA 50
Power	2 x 1359 kW
Gearboxes	2 x ZF BU460
Propellers	2 x Bird-Johnson
Speed	26 kn
Seating	315 x Beurteaux Interior and Exterior Seats
Construction	Aluminium

Vallejo Before Lengthening and Refit
(Photo courtesy Incat Designs)

Vallejo After Lengthening and Refit
(Photo courtesy Incat Designs)

Deliveries

Frank Puglisi of Bermagui recently took delivery of *Santa Lucia*, a GRP longliner from Westcoaster International. She is the latest in a line of longliner derivatives of the west-coast cray boats. The hull is a semi-displacement design by Mark Ellis Marine Design, featuring a bulbous bow. The large working deck aft allows uncluttered working of the gear, comprising a 45 n mile longline drum, shooter, and twin haulers. Most of the working area is protected by a hard-top extension of the cabin deckhead. The hold capacity has been arranged for maximum flexibility: 12 m^3 bait freezer and two live bait tanks totalling 6.5 t forward; two 5 t sprayed RSW tanks amidships, and four 3.5 t holds operating as

sprayed RSW or live bait tanks, as required, aft. Accommodation includes a galley, cabins for the skipper and engineer, and a four-berth crew cabin. In addition to the main controls in the wheelhouse, there is also a helm station aft on the main deck and, unusually for a longliner, on the flybridge. Principal particulars are as follows:

Length	22.80 m
Beam	6.20 m
Draught	2.30 m
Displacement	80 t
Main Engine	Cummins 19KTA
Power	471 kW @ 1800 rpm
Gearbox	Twin Disc 80E, RR 3.41:1
Propeller	Veemstar skewed four blader 1250 x 1050 mm
Fuel	12 000 L
Fresh water	3 000 L

Fishing Boat World, January 2002

NSW State Fisheries recently took delivery of a new GRP patrol vessel, *Ngarru*, built by Stebercraft in Taree. The vessel will be used to patrol the waters between Port Stephens and Tweed Heads. She was launched at Coffs Harbour on 30 November by the Hon. Eddie Obeid M.P., NSW Minister for Fisheries, and will be based at Coffs Harbour due to its central location and access to the Solitary Islands Marine Park. The name, meaning 'water' in the local Gumbaingirr dialect, was the winner in a competition for young people aged four to sixteen years, run in association with *The Advocate* newspaper in Coffs harbour. Mr Obeid said "*Ngarru* is a magnificent addition to the NSW Fisheries' fleet of ninety-three vessels and will provide a fast, reliable means for Fisheries staff to take part in regular patrols, emergency operations and research."

Professional Fisherman, January 2002

Around and About

The South East Trawl Fishing Industry Association is trialling E-boat, a new electronic logbook and software to record and send catch and effort data directly to the Australian Fisheries Management Authority. It can also be used to compile commercial data for operators, and to collect biological and environmental data for research organisations

Software developed in South Africa has been adapted to suit the SE Trawl Fishery and to comply with AFMA's reporting requirements. E-boat is being put through its paces on both *Huon Petrel* and *Josephine Jean*, run by Lockie Marshall out of Eden, NSW. The new technology will also allow recording of depth, moon phase, tide, wind, water temperature, etc. as well as by-catch and by-product information. The use of E-boat will be voluntary, but SETFIA expects widespread use as more data is produced for lower cost.

FRDC R&D News, October 2001

Phil Helmore

The FS8 FlightShip Ground-effect Craft 'Rises' to Expectations

I was delighted, some weeks ago, when I spoke to Mr John Leslie, Managing Director of FlightShip Ground Effect Pty Ltd, in Cairns, Queensland, and he readily agreed to host a visit for Mr Brian Russell and myself. I had met Mr Leslie some years ago and I was aware of his continuing involvement in wing-in-ground-effect (WIG) craft. Mr Russell is the Site Manager of the Hovercraft Museum Trust, in Lee-on-Solent, England.

This type of air-supported marine craft has aroused much interest in Australia in recent years. It is also referred to as the ekranoplan or nizkolet (Russian for 'screen plane' or 'low-flying plane'). Others call this type of vehicle a ram-wing craft, an arcopter (Latin-Greek for 'curved wing'), a power-augmented ram-wing-in-ground (PARWIG) craft, a wingship, a flareboat, and a flarecraft.

WIG Craft (the IMO official term) have been under development in various countries, such as China, Germany, Italy, Japan, Russia, and the United States. These vehicles share two common features; an aerodynamic shape which gives them a lift-to-drag ratio (when flown close to the surface of the ground or the sea), which is intended to be higher than that of an equivalent aircraft flown out of ground effect and, also, inherent dynamic stability.

The Russian ekranoplans have been under serious development for a few decades now and some very large machines, weighing 500 tonnes and travelling at 350 knots, have been constructed and flown.

The term *WIG Craft* is commonly reserved for those aircraft-like designs based on a slender fuselage and a single reverse-delta-shaped low-slung anhedral main wing. The craft must also be equipped with a tailplane which is placed high at the stern in order to provide the necessary longitudinal stability. Another form of this craft utilizes a pair of tandem wings which have sufficient longitudinal stability without the need for a horizontal stabilizer. Lift-to-drag ratios as high as 40 or 50 are possible in carefully-optimised design conditions.

The Cairns craft, designated as the FlightShip FS8, is itself a 'Type A' WIG craft. This was fully described in *The Australian Naval Architect*, Vol. 5, No. 3, August 2001. The craft has a span of 15.6 metres and an overall length of 17.2 metres. It carries two crew plus six passengers.

On the morning of Tuesday 5 February 2002, we were taken out in a support boat to meet the FS8 which had already been launched and we were invited to board the craft. The trip had been organized by Mr Bill Sugars, Manager Training Division, of FlightShip. The operation of the FS8 is being conducted on an extremely professional basis. As is the case with commercial aircraft, we were given a carefully-designed pre-flight safety explanation, which included the provision of a passenger card describing the safety features of the craft. Not surprisingly, these features included seat belts, which were to be fastened at all times. An important justification for this is that the longitudinal centre of gravity of the craft would be affected by gross movements of the passengers.

Once the pre-flight checks were completed by the two crew, the engine throttle was set to a high power, in order to provide

a short take-off run. This process is aided by taking off into the wind. I had already noticed that the wind was slight and that the waves had a significant height of perhaps 0.5 metres. The noise from the aft-mounted single-engine twin-propeller propulsion arrangement was not at all objectionable.

During the take-off, I took care to study the attitude of the wing-tip sponsons and observed their quite deliberate rise out of the water, as a function of the increasing speed. This was accompanied by a small amount of spray at the wing tips, not dissimilar to that associated with a traditional seaplane. As the craft accumulated speed, we were aware of the increasing rate of impacting of the hull of the craft on the wave crests. It was then apparent that this rate of impacting began to decrease, as a result of the fact that only the highest waves were reaching the craft.

Then, suddenly, we left the water altogether, and the ride of the FS8 FlightShip became totally smooth, quite devoid of any influence from the sea state that passed under us. The take-off run had been around 500 metres in length. It was an extraordinary sensation to see the waves pass under us while the air-speed indicator showed that we were travelling at between 75 and 80 knots, on the one hand, and to feel no motion response whatsoever, on the other hand.

It is important to emphasize that the total weight of the FlightShip is still carried by the water, just as in the case of any other marine vessel, such as a boat, hydrofoil, or a hovercraft. In the case of the FlightShip, the air-pressure loading on the water surface is spread over a large area, perhaps over a length of up to eight times the craft length (this characteristic is known from research related to such craft that has been done at UNSW in recent years). In simple terms, Archimedes' principle is satisfied by the FlightShip. The very high speed and this re-distribution of the loading on the water both contribute to the extraordinarily low response of the craft when *flaring* (flying within ground effect) over waves.

When the craft is flaring, much less power is needed than when in the take-off mode. Consequently, the throttle is generally eased off so that the engine speed drops from around 5200 RPM to perhaps 4800 RPM. The cruising power corresponds to around 60% or 70% of full power. If maximum engine power is utilized, the FlightShip can achieve even higher speeds and reach heights of up to 3 metres above the water.

Readers of *The Australian Naval Architect* will be aware that the aerodynamic lift generated is essentially proportional to the square of the speed (from the Bernoulli equation). Thus, it is a significant engineering challenge to select the appropriate shape of the craft so that it will operate correctly over a range of speeds in a stable manner. In a similar manner, the sponsons have also been properly shaped so that occasional impacts with the water surface generate forces whose magnitude and direction will not upset the equilibrium of the WIG craft.

The controls of the FlightShip are simple but effective. Currently, the ailerons on the winglets (which are outboard of the sponsons) are cross-linked to the rudders on the two vertical stabilizers at the stern of the craft. Rotation of the wheel on the control column operates them. As a consequence, the craft executes elegant and coordinated banked turns. This makes travelling in the flare mode a comfortable experience. In addition, the intention now is to separate these two functions, by installing foot pedals which will operate the rudders independently, as is commonly done in aircraft.

Moving the control column forward and aft alters the angle of the high-mounted elevator in the usual manner. Experiments with this control have indicated that the craft quickly reaches its new equilibrium operating altitude and attitude above the water surface, according to the elevator position.

Before landing after our twenty-minute trip, we traversed the wake of an InCat QuickSilver wave-piercing catamaran. This vessel can produce a profound wave system when underway. However, this wave wake had no observable effect on the FlightShip. It is generally agreed that the *air wake* from bluff-ended marine vessels, such as typical catamarans, is felt more than the wave wake itself.

Regarding this last point, it is important to note that the FlightShip also generates a wave wake because, as noted earlier in this article, its weight is still supported entirely by the water when flaring. A careful visual examination of aerial photographs supports this statement. However, as a consequence of its very high speed of travel, the magnitude of the resulting wave system is quite inconsequential.

Shortly after that, we returned to Cairns and alighted on the water. This manoeuvre is accomplished by simply reducing the engine power. The deceleration is initially very small, partly as a result of the reduced drag at lower flaring heights. When the craft drops sufficiently for it to make initial contact with the water, the deceleration increases, but is nevertheless still very gentle. The landing was obviously shorter than the take-off and was quite smooth and uneventful.

There are many applications for the use of the FlightShip. I particularly like the idea of using the craft as a commuter vehicle for travel between the islands in the Great Barrier Reef and other water-based tourist destinations in the world. Use of this craft would make it possible to organize very effective and enjoyable day trips for visitors, as well as for the local population.

The origins of the FlightShip lie in a number of years of carefully planned research by the late Alexander Lippisch, a brilliant aeronautical engineer. This research on ground-effect craft took place in the US during the period 1946 to 1975. Early craft of this type were the two-seater Lippisch X-112 and X-113 airfoil boats.

Some of this research was reported in a series of three international workshops held at UNSW in 1995 and 1996. Copies of the proceedings can be obtained from the Sydney Branch of the Institute of Marine Engineering, Science and Technology (IMarEST).

It is to the great credit of FlightShip Ground Effect Pty Ltd that this project has been finally brought to fruition in a practical form. It is another maritime achievement that Australia can claim. FlightShip has contributed much to the engineering (and re-engineering) of the craft in order to make it a practical and usable vessel. Other companies/

organizations that have assisted with the development of the FlightShip, regarding the technical and safety aspects, include G.A. Glanville and Co. (Naval Architects) Pty Ltd and the Commercial Vessels Branch, Queensland Department of Transport . These contributions include computerizing all the technical drawings and developing rigorous safety procedures and training courses for potential operators of the craft.

I would like to express my personal appreciation to Mr John Leslie, as well as the rest of his dedicated and friendly staff, for his generous hospitality when we participated in the operation of the FS8 and visited the FlightShip Base in Cairns. I wish him and his team well with his venture.

Lawry Doctors

The Eight-Passenger FlightShip 8 flaring at 80 knots near Cairns, Queensland
(Photo courtesy David Philp of FlightShip Ground Effect)

RINA Chief Executive visits Melbourne

Members of the Victorian Section met with Trevor Blakeley, Chief Executive of RINA, on Thursday 31 January 2002 on board *Castlemaine* in Williamstown. Twenty members took the opportunity to meet with him to discuss RINA issues as well as taking time to view the exhibits on display throughout the ship.

Castlemaine was one of sixty Australian minesweepers (popularly called corvettes) built during World War II in Australian shipyards as part of the Commonwealth Government's wartime shipbuilding program. She has a displacement of 640 tons and is 186 ft (56.4 m) long, 31 ft (9.4 m) beam and has a mean draft of 8 ft 3 inches (2.5 m). Twenty were built on Admiralty order but commissioned in and manned by the Royal Australian Navy. Thirty-six were built for the RAN and four for the Royal Indian Navy. All fifty-six Royal Australian Navy ships were named after Australian country cities and towns. *Castlemaine* is the last one still afloat. More information regarding *Castlemaine* can be found on the website www.hmascastlemaine.com.

Stuart Cannon

Trevor Blakeley with Victorian members Samantha Tait (Department of Defence — left) and Michelle Thomson (DNV)

EDUCATION NEWS

University of New South Wales

Undergraduate News

Prabhat Pal has retired from his lecturing position in the Naval Architecture Program. He arrived at UNSW in mid-1980, and was pushed in at the deep end, lecturing within hours of the touchdown of his flight in Sydney! Since then he has lectured continuously in the design strand, and has made a name for himself with his research in optimisation. The full-time naval architecture staff and their partners hosted Prabhat and Anjali to a farewell lunch at Joseph's restaurant in Rose Bay in November. Prabhat and Anjali have since moved to Perth to be close to the grandchildren.

Noel Riley has taken over from Prabhat Pal in teaching of the Ship Design Project course. He also continues his teaching in the Ship Standards course on specifications, tendering, supervision of construction and the USL Code. Noel brings with him a wealth of design, supervision of construction and expert witness experience from the consultancy world, and will inject a highly practical flavour to the design projects.

Post-graduate and Other News

A seminar on *Harbour Ferries: Opportunities for Tomorrow* was held at UNSW and attended by forty-six on 7 November. The event was planned by Dr G.C. Lowenthal, Honorary Visitor to School, A/Prof. L.J. Doctors, Coordinator of the Naval Architecture Program, and Mr P.J. Helmore, Senior Lecturer. Mr J.C. Jeremy Managing Director of Navacon Pty Ltd, assisted with chairing the sessions, and Professor K.P. Byrne, Head of School, welcomed the guests to the School. The evening was commenced with light refreshments and the technical program was as follows:

Mr Thane Scott, Thane Scott and Associates, *Natural Gas for Ferries*

Mr Alex Baykitch, Senior Associate, Blake Dawson Waldron Lawyers, *Harbour Ferries and the Law*

Mr Rod Humphry, Manager for the Sydney Approval Centre, Det Norske Veritas, *DNV's Approach to Domestic Classification of Vessels*

Mr Ben Hercus, Marketing Manager, International Catamaran Designs Pty Ltd, *Keeping Ferries in Service*

Mr Mori Flapan, Technical Adviser, National Maritime Safety Committee Secretariat, *Safety Obligations and the New National Standard for Commercial Vessels*

Mr Grahame Parker, Managing Director, Grahame Parker Design Pty Ltd, *Some Design Aspects for Harbour Ferries*

There has been much interest in recent months in the ferry services on Sydney Harbour, so it was heartening to note the good roll-up of the maritime community, who joined in the lively but friendly discussions during the very pleasant evening.

The organisers would like to take this opportunity of publicly thanking the six invited speakers, who all went to a lot of trouble to prepare technically-superb presentations and for stimulating the discussions.

At the *Harbour Ferries* Seminar: Lawry Doctors, Kerry Byrne, Grahame Parker, Thane Scott, Rod Humphrey, Mori Flapan, John Jeremy, Ben Hercus, Alex Baykitch and Gerhard Lowenthal
(Photo Graham Morrison)

Lawry Doctors has recently been promoted from the position of Associate Professor to Professor. This is no mean feat, as it requires excellence in *all* of teaching, administration, research, grant-pulling, and extra-mural activities (a minor lack in any of these is equivalent to a torpedo). Congratulations Lawry!

Two presentations were made by UNSW academics at the Pacific 2002 International Maritime Conference (Pacific 2002), held in Sydney on 29–31 January 2002.

Phil Helmore and Lawry Doctors explained some of the changes made in the last two years in their paper *The New Naval Architecture Program at UNSW*. They provided an outline of the program since its inception in 1962, together with the philosophy behind the design of the curriculum. In addition, they detailed the changes that have been recently introduced, as a result of an extended effort to obtain feedback from both students in the program and industry employers. Three new courses, which relate directly to the practical aspects of Naval Architecture, include NAVL3110 Ship Practice, NAVL4101 Design of High-Speed Craft, and NAVL4102 Design of Yachts. As a result of these enhancements, the lecturing staff (including part-time personnel) has now been increased to seven in number.

Lawry Doctors presented his paper *The Wave-Wake System of a High-speed Marine Ferry* and expounded on some recent research that has been conducted in order to learn more about the development and decay of the waves created by monohulls and catamarans. In particular, he placed an emphasis on the question of the rate of decay of the height of the generated waves with distance away from the vessel. The wave height varies with a power of the distance, which lies between –1.06 and –0.20. The specific value of this power depends essentially on the Froude number. There has been much confusion on this issue amongst the professional naval architecture community in recent years. Despite considerable publicity on this question at international conferences, including conferences organised by the RINA in England, there is a popular misconception that the decay power is precisely –1/3 in all circumstances.

Phil Helmore
Lawry Doctors

THE INTERNET

Volvo Race Update

The Volvo Ocean Race yachts sailed into Sydney in early December at the end of their second leg from Capetown, South Africa. They then left on the third leg (to Auckland, New Zealand) with the Sydney–Hobart yachts on 26 December, bound for the Derwent and, after a short pitstop there, headed for Auckland. They had a couple of weeks in Auckland, and started the fouth leg (to Rio de Janeiro) on 27 January. *Team Tyco*, skippered by New Zealander Kevin Shoebridge, led from the start in Auckland, around the Coromandel Peninsula and around East Cape (the easternmost point of the North Island) bound for Cape Horn, but has since been overtaken.

At the end of the third leg in Auckland, the overall positions were: *illbruck Challenge*, *Amer Sports One*, *Team News Corp*, *Assa Abloy*, *Team Tyco*, *Team SEB*, *djuice*, and *Amer Sports Two*. However, the positions change almost daily.

As we go to press, the yachts are in about 60°S latitude, 1200 miles from Cape Horn, experiencing storm-force winds from the west and 9 m seas, and are surrounded by icebergs! The Australian entry, *Team News Corp*, hit an iceberg recently and has lost ground as a result. *Team Tyco* has moved up to second overall as a result of her fast exit of New Zealand waters. Australian Peter 'Spike' Doriean is crewing on board the Norwegian entry *djuice dragons*, skippered by Knut Frostad.

The race started from Southampton, England, on 23 September 2001 and, after Rio, the yachts will visit Miami, Baltimore/Annapolis, La Rochelle, and Gothenburg before crossing the finish line in Kiel in June. To keep up-to-date with the race and current positions, visit the official race website at www.volvooceanrace.org.

The Hundred Loonies Challenge

In the vein of the annual Rat Trap Race held at the Australian Maritime College and the Beer Can Challenge held in WA last year, SNAME's Canadian Atlantic Student Section at Memorial University, St John's, Newfoundland, delivered an exciting student competition in mid-August 2001 — just after final exams. This was the inaugural 'The Hundred Loonies Challenge' boatbuilding and racing game. Two teams comprising students from Ocean and Naval Architectural Engineering, one of term-four students and another of mostly term-seven students, competed by building a vessel each. Each vessel had dual power sources: human and sail.

A key constraint was that the materials bought (or otherwise acquired) by the team could not exceed $100 — hence the name 100 loonies (the Canadian $1 coin has a loon on one side, and is commonly referred to as a 'loonie'). Further, the vessel had to have the capability of moving under human power in one direction across the race course, and under sail in the other direction. Only hand tools were allowed for the construction job, which occurred immediately prior to the race.

The term fours constructed a twin-pontoon type vessel using cardboard tubes covered with plastic and reinforced with high-grade Styrofoam, and an A-frame mast. The term sevens went for a more traditional monohull using a wooden frame covered with a plastic and tarpaulin shell, and a single mast.

The competition took about five hours, of which the last ten minutes were spent racing. The winner was the term fours, as they got furthest around the course before stopping!

Plans are being made for the next student projects: The second annual Brunel's Great Big Boat Building Bash, and the Shipshape and Bristol Fashion Cardboard Boat Competition. Check them out at www.engr.mun.ca/naval/snamess.htm.

Online Marine Store

Mariner Supply, a US-based sales and distribution company, has recently launched an online marine store to serve marine professionals, boatbuilders, commercial fishers and recreational boaters looking for quality parts and products.

This online marine store is different from the competition in several ways. Firstly, there is a wide selection of commercial quality parts and equipment. They have partnered leading manufacturers and suppliers to assemble everything from commercial fishing gear, engine parts and custom shafts to recreational boating supplies. The list of products is continually growing as new suppliers are continually being added, helping the site to have one of the best selections of commercial quality marine parts offered anywhere. Secondly, all the products can be purchased online. The site was designed to be fast and easy to use, and offers a 'Parts Counter', where you can order parts from a product's exploded parts diagram. Customers can also print out assembly drawings, parts lists and installation instructions. There is a powerful search engine which helps a visitor quickly locate the right part in the store. For parts not currently in stock, there is a 'Parts Finder' service, where a customer can either call or email the specifications of the part required, and a trained staff member will help locate it.

For parts you never knew existed or are having trouble finding, or just out of interest, visit www.go2marine.com.

Phil Helmore

Propeller Design for All

Sites on the web vary widely in the quality of their content. Sometimes, in the search for other things, you come across a site which is interesting, has some home truths, and is told in a very easy-to-read style. If you want just such a good read, giving a student's view of propeller design, then point your favourite browser at www.warships1.com/w-tech/tech-034.htm.

Tony (Neville A.) Armstrong

EVALUATION OF SEAKEEPING AND MOTION CHARACTERISTICS OF THE ROYAL AUSTRALIAN NAVY WAVE-PIERCING CATAMARAN HMAS *JERVIS BAY*

Seref Aksu, Darren Sanford, Lloyd Hammond and Stuart Cannon
Defence Science and Technology Organisation

1. INTRODUCTION

HMAS *Jervis Bay*, a high-speed catamaran built by Incat Australia, was chartered by the Royal Australian Navy (RAN) in May 1999 for two years. The rationale behind this arrangement was that the RAN needed to fill a temporary capability gap whilst two Landing Platform Amphibious ships, HMAS *Manoora* and *Kanimbla*, were being refitted. The main role of HMAS *Jervis Bay* was to assist in transporting troops to East Timor. The principal particulars of HMAS *Jervis Bay* are given in Table 1.

During her service in the RAN, HMAS *Jervis Bay* made 107 return trips to East Timor. She carried thousands of Australian Defence personnel, their equipment, military vehicles including armoured vehicles, food and humanitarian aid to East Timor. All in all, the vessel travelled more than 110 000 n miles and, more importantly, most of this distance was travelled at a speed of 40 kn, which set a new operational speed limit for RAN ships.

Comments on the operational effectiveness of the vessel, made by the commanding officers and the crew, were very positive and the charter arrangement was regarded as very successful. The success of HMAS *Jervis Bay* in operating as a transport and logistics support ship for the Australian Defence Force (ADF) focused the attention of the naval community on the operational benefits of using high-speed surface platforms in the transport and logistics roles. For this reason, Incat and other Australian high-speed ferry builders such as Austal Ships, have attracted considerable interest from the US Navy and US Coastguard. The RAN is also keen to further explore the concept as a long-term capability.

During her service in the RAN, HMAS *Jervis Bay* has undergone various platform and military-based assessments. One such assessment was the evaluation of seakeeping and motion characteristics of the vessel by means of a dedicated sea trial.

The Defence Science and Technology Organisation (DSTO) has expertise and experience in conducting and analysing the results of sea trials. Specific examples of DSTO's work include a hydrodynamic load trial on HMAS *Swan* [1] and seakeeping trials on the Hydrographic Survey Ships HMAS *Melville* and *Leeuwin*. Dedicated sea trials are often limited by cost considerations. Thus it is not always possible to consider a large variation of speeds and heading angles in a large variety of sea-states. In addition, trials are often constrained by the prevailing weather conditions at the time of the trial. Similarly, it may not be possible to fully instrument the ship with sensors and gauges in all the desired locations. The result is that the full operational envelope of the ship is often not fully determined. Hence, there is a requirement for numerical modelling to extend the analysis over a full range of sea states and operating limits. However, it is necessary that the numerical models are validated and the limits of the analysis are established.

In this paper, the details of a dedicated sea trial on HMAS *Jervis Bay* are presented. The results of the trial are compared with the numerical analysis that is based on a three-dimensional panel method. The model is then extrapolated to determine the motions and responses in higher sea states.

Length overall	86.1 m
Breadth	26.0 m
Draught	3.54 m
Displacement	1250 t
Power	28320 kW
Propulsion	4 Waterjets
Service Speed	43 kn

Table 1 Principal particulars of HMAS *Jervis Bay*

2. SEAKEEPING TRIAL

The aim of the seakeeping trial was to determine the motion response of the catamaran to various sea headings and speeds. Such information will enable the RAN to identify what type of motions can be experienced from a large wave-piercing catamaran in open sea conditions so that the operational envelope for such vessels can be determined. The information gathered from the seakeeping trial will also enhance DSTO's knowledge base so that better advice can be given to the RAN for future acquisitions.

2.1 Instrumentation

The instrumentation system for the HMAS *Jervis Bay* motion trial consisted of three components: a Ship Motion Recorder (SMR), a TSK wave-height sensor system, and a motion sickness monitor.

The SMR consists of five tri-axial accelerometers that measure the translational (heave, surge and sway) and angular (yaw, roll and pitch) motions as well as the rate of the angular motions. An inbuilt compass enables the heading to be determined. The system has an analogue-to-digital converter to enable the signals to be recorded on a personal computer. This system can record up to 32 channels at any one time. The five tri-axial accelerometers were installed on the main passenger deck at the following locations.

1. At amidships. This was also the location of the entire Ship Motion Recorder.
2. At the longitudinal centre of gravity (LCG) on the centreline.
3. At the LCG on the port side.
4. At the after end of the passenger compartment on the centreline.
5. At the after end of the passenger compartment on the port side.

The TSK wave-height sensor consists of two components: a transmitter/receiver sensor measures the distance from the bow to the sea surface, and an accelerometer mounted at the bow determines the movement of the bow due to motions of the ship. The signals from these two sensors are integrated to determine the measured sea state.

2.2 The Trial Location and Matrix

The RAN dedicated a full day for the ship motion trial on 4 July 2000, which was conducted off the coast of Sydney. Part of the sensor and cable installation was carried out in June whilst HMAS *Jervis Bay* was in dry dock. The remainder was installed just prior to the trial.

A number of runs were required to assess the seakeeping behaviour of the catamaran at different forward speeds and heading angles. For this reason, five different wave directions (i.e. head, bow quartering, beam, stern quartering and following seas) and two ship speeds (40 kn and 20 kn) were considered. Throughout the trial, the ship's ride-control system was active. However, in order to quantify the effect of the ride-control system, two additional runs in head seas were carried out at 20 and 40 kn with the ride-control system deactivated. Finally, in head seas at a speed of 5 kn, a run was carried out to determine the ship's movement at loiter speeds. The ride-control system is not effective at this speed and automatically deactivates itself.

Thus, a total of thirteen data runs each of 25 minutes duration were carried out during the trial. This is considered to be the minimum recording time required in order to obtain reliable statistics. Table 2 provides a summary of the trial matrix.

Run No	Heading	Speed (kn)	Ride control
1	Head seas	40	On
2	Head seas	40	Off
3	Bow quartering seas	40	On
4	Beam seas	40	On
5	Stern quartering seas	40	On
6	Following seas	40	On
7	Head seas	20	On
8	Head seas	20	Off
9	Bow quartering seas	20	On
10	Beam seas	20	On
11	Stern quartering seas	20	On
12	Following seas	20	On
13	Head seas	5	Off

Table 2 Data runs conducted during the trial (Each run is 25 minutes long)

2.3 Sea State

During the trial, the TSK wave-height sensor malfunctioned and the problem could not be rectified. The sea conditions were therefore obtained from the Manly Hydraulics Laboratory (MHL). MHL has a wave-rider buoy located 5.4 n miles off the coast of NSW, north east of Sydney in 85 m of water, which fortunately was in the vicinity of the trial area. The data from the MHL buoy was considered appropriate for providing the sea state information for the HMAS *Jervis Bay* trial. The significant wave height was approximately 2.0 m and fairly constant during the trial period. This corresponds to the mean of Sea State 4, defined by the World Metrological Organisation [2].

3. ANALYSIS OF TRIAL DATA

3.1 Methodology

Data records downloaded from the SMR contained thirty-two channels of ASCII data. SMR data records were produced for each of the thirteen runs and the data was analysed using the Mathcad 2000 software package. The methodology incorporated in the Mathcad worksheets was designed specifically for analysing tri-axial accelerometer data acquired on dedicated sea trials.

After selecting the accelerometer axis of interest, a Fast-Fourier Transform (FFT) was performed on the accelerometer data in order to determine suitable cutoff frequencies for bandpass filtering. The peak locations are determined by differentiating the acceleration record with respect to time. Maxima and minima were located by determining where the differentiated acceleration record equals zero. Doublets were considered as false maxima or minima with the one of lesser magnitude being automatically removed (see Figure 1).

Statistical analysis was performed on each of the peak acceleration data sets, yielding:

- Maximum, minimum, mean and standard deviation values for each of the entire positive and negative peak data sets
- Maximum, minimum cutoff, mean and standard deviation values for the one-third highest of the positive and negative peak data sets (for example, the mean value of this process is equivalent to the significant peak value); and
- Maximum, minimum cutoff, mean and standard deviation values for the one-tenth highest of the positive and negative peak data sets.

An example plot of the top one-third of the positive and negative peak accelerations is shown in Figure 2.

Similarly, the filtered acceleration data were integrated once and twice with respect to time to produce the related time-based velocity and displacement records, respectively. A *moving average* function was used to remove any baseline drift from the velocity and displacement data. The moving average function was applied to remove the baseline drift inherent with data integration. These velocity and displacement time records were then analysed in a similar manner to the acceleration data.

3.2 Statistical Analysis of Motion Time Simulations

Detailed analyses were performed on the vertical and transverse acceleration records obtained from the accelerometers. Hybrid polar plots generated for this purpose consisted of a series of acceleration contours for various speeds and headings. It has been assumed that measurements for the ship encountering waves from the fourth and third quadrants (360° to 180°) were equivalent to those taken for the first and second quadrants (0° to 180°), based on following to head sea vessel symmetry (i.e. on starboard and port sides). Hence the polar plots are hybridised by presenting measurements for 0° to 180°, but with positive

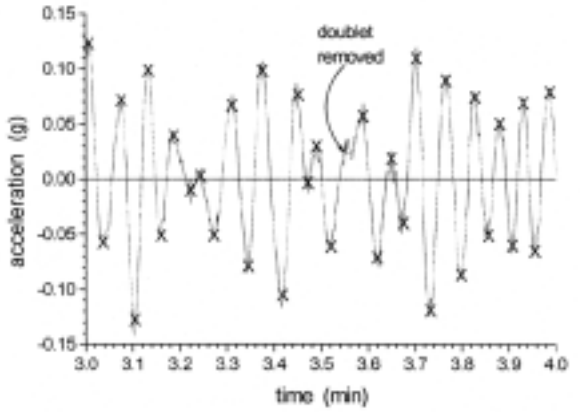

Figure 1 Sample of a raw (….) and the corresponding bandpass filtered (——) acceleration-time records. The crosses indicate the peak maxima and minima located by the Mathcad search algorithm.

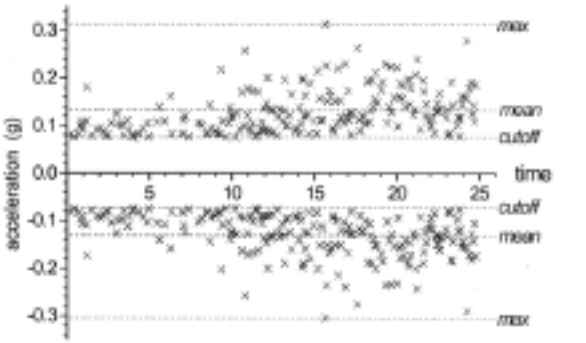

Figure 2 The top one-third of the positive and negative peak accelerations for a typical 25 minute vertical acceleration record obtained from the accelerometer located at the LCG. The cut-off, mean and maximum values are displayed on the graph.

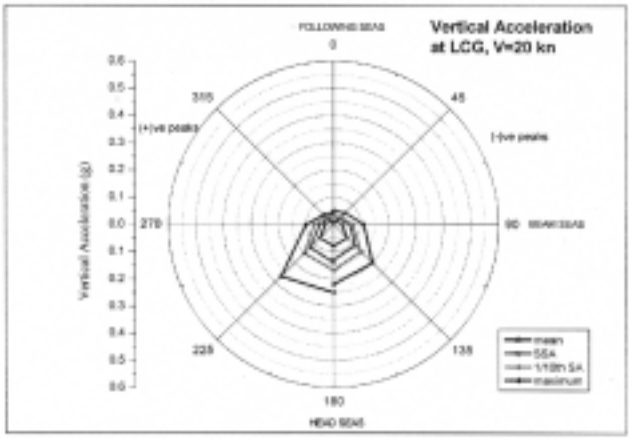

Figure 3 Hybridised polar plot for the peak statistics of the vertical acceleration records at the longitudinal centre of gravity for the vessel travelling at 20 kn in oblique seas described with a significant wave height of 2 m. The contours of mean, top 1/3 (significant), top 1/10 and maximum peak acceleration values are represented in the order of increasing magnitudes respectively.

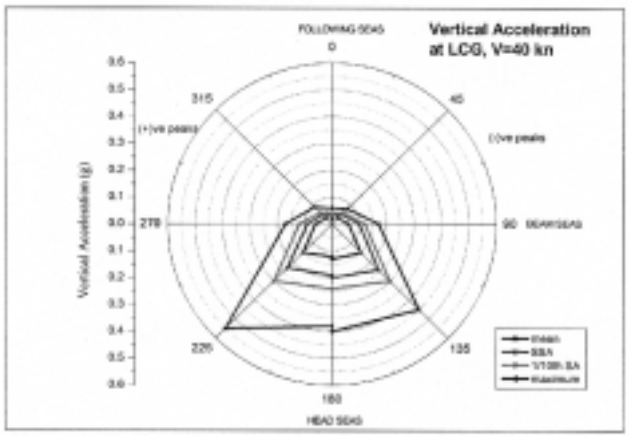

Figure 4 : Hybridised polar plot for the peak statistics of the vertical acceleration records at the longitudinal centre of gravity for the vessel travelling at 40 kn in oblique seas described with a significant wave height of 2 m. The contours of mean, top 1/3 (significant), top 1/10 and maximum peak acceleration values are represented in the order of increasing magnitudes respectively.

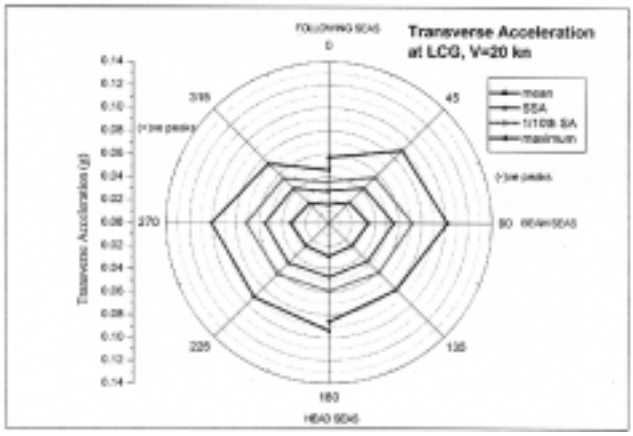

Figure 5 : Hybridised polar plot for the peak statistics of the transverse acceleration records at the longitudinal centre of gravity for the vessel travelling at 20 kn in oblique seas described with a significant wave height of 2 m. The contours of mean, top 1/3 (significant), top 1/10 and maximum peak acceleration values are represented in the order of increasing magnitudes respectively.

(first and second quadrants) and negative (third and fourth quadrants) magnitudes.

The vertical and transverse peak acceleration, velocity and ship-motion amplitude polar plots have been generated for the 20 and 40 kn vessel speeds. The peak vertical acceleration plots for the 20 and 40 kn speeds are shown in Figures 3 and 4, respectively. Similarly, the peak transverse acceleration plots for the speed of 20 kn are shown in Figure 5. It is noted that the measured positive and negative peak statistics are non-symmetric, indicating the non-linearities occurring in motions.

4. NUMERICAL ASSESSMENT

4.1 Mathematical Modelling

The program PRECAL [3] was used to perform the numerical predictions. This program was obtained through the Cooperative Research Ships (CRS) international collaboration. The main purpose of the program is to provide ship designers with a computational tool to predict motion and wave loads on any vessel. The major capabilities of PRECAL include:

- Calculation of the vessel motions and wave loads in regular waves based on three dimensional potential theory with optional inclusion of viscous and fin effects for mono- and multi-hulls;
- Active control of fins and/or rudders for mono-hulls by definition of a set of control gains and actuator coefficients;
- Calculation of motion and wave load responses in regular waves with different wave heights or in random waves defined by significant wave height and spectra period; and
- Calculation of instantaneous pressures over the wetted hull surface as the input to finite element structural analysis programs with optional interpolation schemes.

The first module of the program suite generates the hydrodynamic mesh and calculates the hydrostatics and mass inertia terms. The program subsequently calculates the velocity potentials, source strengths and flow velocities at the centroids of the hydrodynamic panels. The potential flow components of the hydrodynamic forces are calculated using three-dimensional potential flow theory with either the zero speed Green's function or the so-called 'exact' Green's function. The hydrodynamic forces and moments acting on the ship are considered from three sources: potential flow component, viscous effects of bare hull, and fin effects from stabilizing fins. The potential flow components of the hydrodynamic forces are used to obtain the motion and load responses in regular waves. Finally, the motion and load responses in random waves can be calculated using the results from the regular wave responses and user-specified sea state.

4.2 Motion Predictions

The surface geometry of the vessel was described by using approximately 400 hydrodynamic panels. The same load condition with the trial's load case was considered to determine the displacement and the longitudinal centre of gravity (LCG) values. Vessel speeds of 20 kn and 40 kn were considered in line with the seakeeping trial speeds. The vessel was assumed to travel in head (180°), beam (90°), following (0°) and bow (135°) and stern (45°) quartering seas. The irregular seaways were described by the International Ship Structures Committee (ISSC) spectra. The spectra considered are given in Table 3.

Sea State	Significant Wave Height (m)	Characteristic Wave Period (s)
3 (mean)	1.0	8.9
4 (mean)	2.0	10.3
4 (top)	2.5	11.1
5 (mean)	3.25	11.7
5 (top)	4.0	12.3
6 (mean)	5.0	12.8

Table 3 Sea states considered for the numerical predictions. Sea state 4 (mean) corresponds to the trial sea state condition.

Three-dimensional hydrodynamic coefficients and the Response Amplitude Operators (RAOs) of rigid-body motions, vertical and transverse displacements, velocities and accelerations were calculated for a range of frequencies. The statistical information of motions was determined through the spectral moments. In addition, RAOs of the vertical and transverse forces and moments (vertical bending moments, shear forces, torsional moment, pitch connecting moment, split moment, etc.) were calculated. The program does not provide the statistics of the responses, but an in-house routine was written to determine the statistics from the spectral analysis.

4.3 Comparisons

The vertical and transverse accelerations measured during the trials were compared with those predicted from the numerical calculations. As can be seen from Table 4, a good correlation was achieved between the measured and predicted vertical accelerations for the vessel travelling at 20 kn. However, correlation was not as good for those at a speed of 40 kn. As expected, the transverse accelerations were much smaller in magnitude than the vertical accelerations. Very good agreement between the measured and the predicted transverse accelerations was observed at 20 kn (see Table 5). Similarly, good agreement was observed for beam seas at 40 kn. However, there is a large discrepancy between the measured and predicted values at 40 kn in bow quartering seas.

Similar levels of agreement were observed between the measured and numerically-predicted pitch and roll motions for each case at 20 kn and 40 kn. From these preliminary findings, it was considered that at high speeds (40 kn), the numerical calculations may over-estimate the accelerations due to underlying assumptions made in the analysis such as linearity, potential flow, etc. Complications with the numerical predictions meant that the ride-control system was not accounted for in the analysis, resulting in higher acceleration values. Effectiveness of the ride control is governed by the ship speed and wave height. In general, the ride control is not effective for speeds up to 28 kn. From the

	Vertical Acceleration (g) Bow quartering Seas (135°)		Vertical Acceleration (g) Head Seas (180°)	
Ship Speed	Trial	Predicted	Trial	Predicted
20 kn	0.12	0.15	0.14	0.19
40 kn	0.24	0.60	0.20	0.75

Table 4 Comparisons between the measured and predicted Significant Single Amplitude (SSA) vertical accelerations. (* Numerical predictions are for Sea State 4 (mean) with $H_{1/3}$=2.0 m and T=10.3 s).

	Transverse Acceleration (g) Beam Seas (90°)		Transverse Acceleration (g) Bow quartering Seas (135°)	
Ship Speed	Trial	Predicted	Trial	Predicted
20 kn	0.056	0.047	0.045	0.048
40 kn	0.053	0.047	0.059	0.098

Table 5 Comparisons between the measured and predicted Significant Single Amplitude (SSA) transverse accelerations. (* Numerical predictions are for Sea State 4 (mean) with $H_{1/3}$=2.0 m and T=10.3 s).

limited runs made during the trial, the effect of ride control was found to be of the order of 5-10% for vertical accelerations at the LCG in head seas.

4.4 Response Predictions

The comparisons provided some degree of confidence in the validity and applicability of the numerical prediction code. This enabled further motion characteristics and responses (bending moments, shear forces, torsional moment, etc.) to be predicted. The global responses of the wave-piercing catamaran are presented in a non-dimensional form. Since the vessel was designed to Det Norske Veritas' (DNV's) High Speed Light Craft Rules [4], it was deemed appropriate to use DNV's design rule values for determining the non-dimensionalised data. Figure 6(a) shows the variation of the vertical bending moment at 20 kn with different headings at various sea states. The non-dimensional vertical bending moments were determined by dividing the actual values by design vertical moment value for crest or hollow-landing cases as defined in Figure 6(b). As can be seen from the figure, the predicted value at top of sea state 5 was about 50 percent of the design value. This is the maximum operational condition for which the vessel was designed.

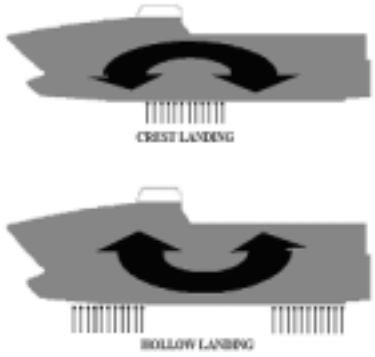

Figure 6(b) Crest and hollow-landing definitions by DNV.

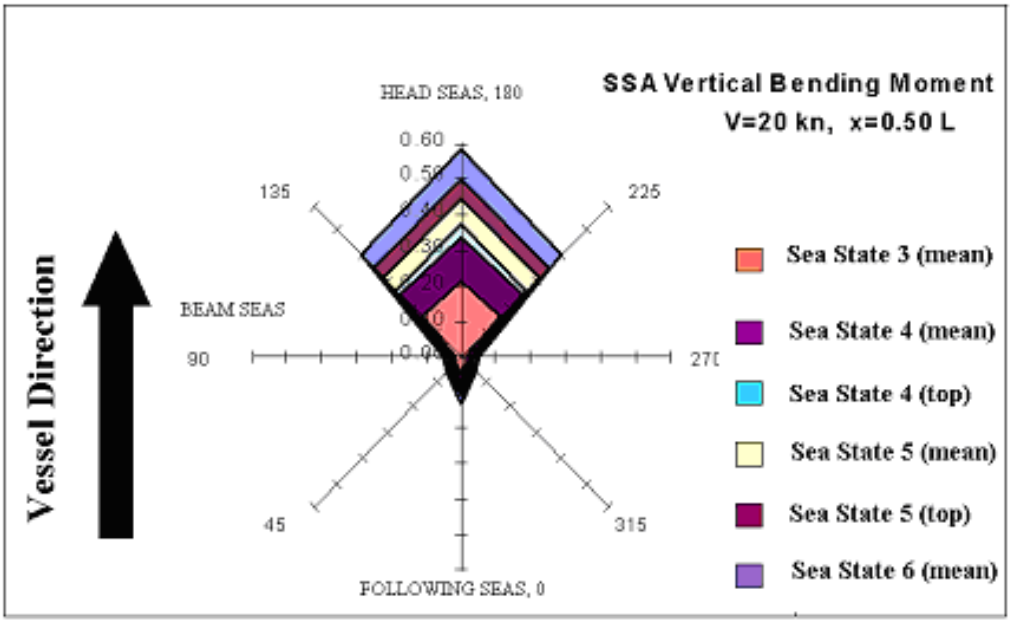

Figure 6(a) The predicted non-dimensional vertical bending moments. The vessel travels at 20 knots in oblique seas ranging from Sea States 3 to 6.

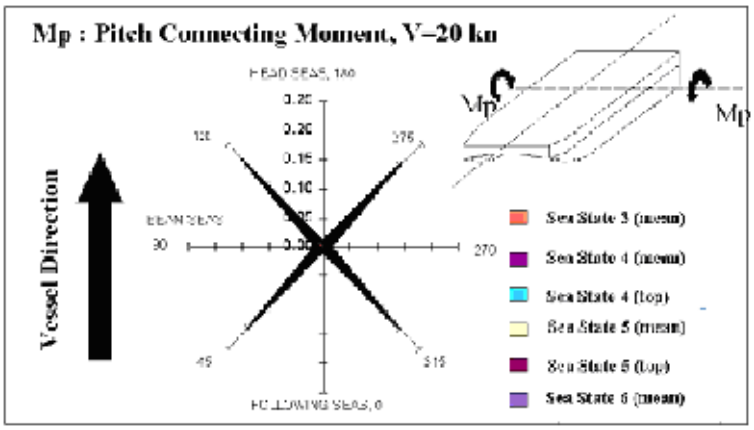

Figure 7 The predicted non-dimensional pitch connecting moments. The vessel travels at 20 knots in oblique seas ranging from Sea States 3 to 6.

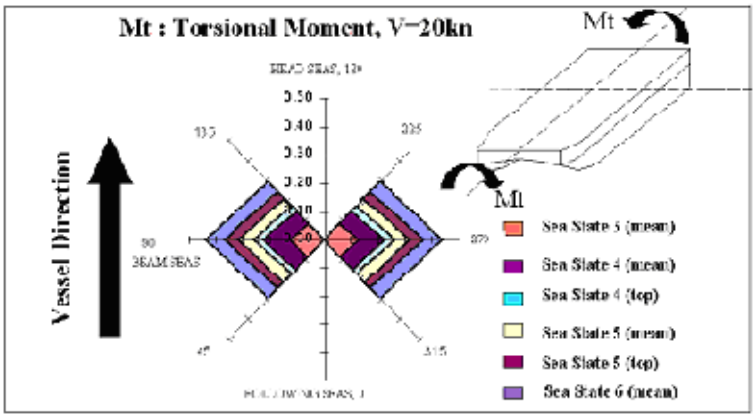

Figure 8 The predicted non-dimensional torsional moments. The vessel travels at 20 kn in oblique seas ranging from Sea States 3 to 6.

The non-dimensional pitch connecting moments for the vessel travelling at 20 kn speed in various oblique seas are shown in Figure 7. The definition of the pitch connecting moment is also shown in the top right corner of the figure. As expected, the maximum pitch connecting moments were observed in quartering seas, tentatively confirming the validity of predictions.

Similarly, the non-dimensional torsional moments are shown in Figure 8. The definition of torsional response is also shown in the top right corner of the figure. In this case, large torsional moments were observed in beam and quartering seas. The predicted maximum torsional moment at 20 kn in Sea State 6 was of the order of 50 % of the design value.

5. CONCLUSIONS

A successful seakeeping and motion trial has been carried out on HMAS *Jervis Bay*. A procedure for the analysis of trials data was developed which can be employed on future trials to measure the performance of RAN assets.

The trial results have been compared against the CRS code, PRECAL. For this type of vessel, the code performs satisfactorily at the lower end of the speed range, although discrepancies arise as the speed increases. This may be due to the inherent assumptions in the linear theory. It is recommended that further development and validation of the code be undertaken if this tool is to be used to predict the motions and responses of multi-hulled vessels.

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SEAKEEPING CHARACTERISTICS OF PATROL BOATS — SOME MEMORIES

Robert J Herd

INTRODUCTION

Bruce McNeice's article in *The ANA*, November 2001, roused some memories in one who served as a seaman in a B class Fairmile motor launch and also in a Bathurst class minesweeper in World War II. I believe that the RAN is to be congratulated on its efforts to seek comments from the crew members of the Fremantle class patrol boats for use in drawing up a specification for a new class of patrol boat.

SOME COMPARATIVE PARTICULARS

For purposes of comparison, some published particulars for three classes of patrol vessels which have served in the RAN are shown in Table 1 [1, 2, 8, 11].

CLASS	B	ATTACK	FREMANTLE
Displacement	91.6 t	148.7 t	224 t
Length oa	33.94 m	32.58 m	41.67 m
Breadth oa	5.53 m	6.06 m	7.35 m
Depth	3.64 m		
Draught (mean)	1.49 m	1.92 m	1.74 m
Power	895 kW	2 580 kW	2 386 kW
Fuel	Petrol	Diesel	Diesel
Speed	20 kn (designed) 18 kn (actual)	19 kn	30 kn 0-8 kn saunter
Crew	17	19	22
Range	600 n miles at 20 kn, 1 500 n miles at 12 kn	1 200 n miles at 13 kn	5 000 n miles at 5 kn, 2 360 n miles at 12 kn

Table 1 Some comparative particulars

SEAWORTHY AND SEAKINDLY

The definitions of seaworthy and seakindly as used by Kent [9], who spent an extensive period at sea studying ship behaviour, have been found very useful and apposite:

'A seaworthy vessel is one which will survive the worst storms without capsizing or suffering serious damage to her structure but when labouring in a seaway she may be difficult to handle, her motion uneasy, her decks flooded with seawater and her bridges and upperworks continually wet with spray.

'A seakindly ship is one which rides the seas in rough weather without shipping green water and with little spray blown inboard. She will stay on her course with only an occasional use of the helm irrespective of the direction in which she meets the wind and waves, she will respond quickly to small changes in rudder angle and maintain a fair speed without slamming, abnormal fluctuations in shaft torque, or periodic racing of her engines. Open decks will be easy to traverse in all weathers by her passengers and crew without danger or discomfort, and her behaviour in a seaway, i.e. her rolling, pitching, yawing, heaving, surging or swaying will always be small in amplitude, smooth and easy, and free from all baulks or shocks.

'In any type of ship, expert handling by her master and crew will always be required to produce a seakindly performance in rough water, and such expert handling is assumed to be always available.'

Similar definitions are espoused by Marchaj [10], together with one on habitability.

Mr W. J. Holt, who designed the B class Fairmiles, had this to say [1]:

'A round-bilge form had been designed in the Admiralty, and this form had been tested in the Admiralty Experiment Tank, Haslar, and was known to be favourable, both as regards resistance and in seakeeping ability.'

'The B type ML was found to be very seaworthy.'

'The B MLs were used for all sorts of services in all zones of operations.'

'The MLs …… built during the war have been severely tested for seaworthiness, both deliberately and incidentally to their service.'

'On the high seas the MLs are small in relation to the seas they encounter; they are also light and have little grip of the water. In consequence, they are thrown about and knocked over by the sea in a manner not experienced by larger ships nor even by the relatively small but heavy and deep draught vessels such as trawlers.'

These views are consistent with those of officers who served in MLs [5]:

'Nobody ever feared that a Fairmile would sink in heavy weather, but it could be uncomfortable. On an ML, standing on the bridge amidships looking forward, the boat gathered pace going down a wave into the face of the next wave some 30 or 40 ft (9 or 12 m) high with flying fish flitting out of it, the bow just dug into the wave, then slowly started to rise as the wave came 6 or 8 ft (2 or 3 m) high over the gun and onto the wheelhouse windows, then passed aft about 1 ft (0.3 m) or more deep all along the length of the boat almost to the stern.

'The bridge only received spray. Looking at other MLs in line astern or abreast, they always seemed to be having a much worse time. They would disappear into a wave, and just stay disappeared. Frequently on passage, none of the flotilla would be able to see any of the others by the next morning, but during the day they would converge and enter harbour in line astern as if they had been for a short cruise on a millpond.'

The photograph accompanying Bruce McNeice's article suggests that the seakeeping performance of the Fremantle class, although said to be an improvement over that of the Attack class (which is presumably an improvement over that of the B class), could still be described in the terms used above.

The B class were not fitted with bilge keels and had a great propensity for rolling, eclipsing the Bathurst class minesweepers in this respect. The vessels were built with a coach house extending from the fore end of the wheelhouse aft to the engine room access hatch. The main access hatch from the crew accommodation led onto the coach house from whence other areas of the ship could be reached. Care was always needed during heavy rolling not to step from the coach house to the side deck with the roll as it was possible to step over the guard rail accidentally due to the acceleration and absence of handholds. Access from the wardroom located aft to the bridge was along the deck and onto the coach house.

From a personal viewpoint (and using Kent's criteria) the B class Fairmile was seaworthy but not always seakindly.

OPERATIONAL EFFECTIVENESS

Coupling the operational effectiveness of the new vessels to their designed performance will demand the achievement of considerable flexibility in their service requirements.

The B class MLs are a case in point. The history of their design and anticipated operational role is described by Holt [1] and Lambert and Ross [2].

However, as the demands of war increased, the vessels served in a number of areas, particularly in the tropics. The differences in their roles is highlighted by comparing the operations in The Channel described by Scott [3] and Armstrong [12], in Australia and New Guinea [4, 11], and in India and Burma [5, 6].

To quote Holt [1]: 'it was arranged that the B MLs could be tinker, tailor, or soldier at short notice, i.e. were convertible to one or the other of the services of minelayer, MTB, anti-submarine boat, anti-invasion boat, anti-E boat or air-sea rescue at 48 hours notice.'

To these roles could be added shore bombardment, hydrographic surveying, landing agents and coast watchers, ferrying troops, etc.

Within the lifetime of the RAN's new vessels it seems certain that they will be called on to fill new roles unthought of at the design stage — witness events in recent months.

Prior to engaging in hydrographic surveying, an ML was stripped of its asdic (sonar) dome and fitted with an echo-sounder dome mounted on a box-section cantilevered beam attached to the ship's side forward. Doubt was expressed about the accuracy achievable because of the arc swept during the ML's rolling, the capacity for which was well known. However, comparative surveys conducted by three different vessels over the same area found no significant discrepancy.

A Fairmile B class motor launch on Sydney Harbour in 1957. This is *Sandra*, one of two completed as target towing launches for the Australian Army (Photograph John Jeremy)

Some years ago a proposal was advanced for Attack class patrol boats to double as lighthouse service vessels and as surveillance vessels when required. An inspection of boats then building at the Evans Deakin shipyard was made to assess the proposal.

The questions pursued included the ability to lift on board lightbuoys weighing several tons, deck strength, available deck area for servicing, provision of necessary stores and workshops, stability and trim, accommodation for the necessary additional personnel, influence on speed, etc. A critical question was the possibility of making an urgent dash to intercept some errant fishing boat while carrying a large lightbuoy on board.

The number and position of hand holds observed in the wheelhouse raised more questions of practicality. The project was not recommended and was not proceeded with.

HABITABILITY AND CREW PERFORMANCE

Marchaj [10] defines habitability as:

'Space for living quarters with good headroom and comfort. It is concerned with providing the crew with an environment that permits them to function effectively without degrading their mental and physical performance because of the boat's interaction with the sea producing excessive motion (rolling, pitching) and accelerations.'

The evidence provided from the survey of the Fremantle class patrol boats (FCPBs) suggests that there has been little significant improvement over the recollected experience at sea in B class MLs.

The parameters Motion Induced Interruptions (MII) and Motion Sickness Incidence (MSI) could be useful when sufficient data is recorded against detail of wind and sea conditions and direction, courses maintained, etc.

Not infrequently, the task in hand and the area of operation will not permit course adjustments to ameliorate

HMAS *Warrnambool* demonstrating the advantages of bow flare
(RAN photograph)

unfavourable influences on crew efficiency. Examples experienced by the author include anti-submarine patrols in Grafton Passage, anti-submarine protection during assault ship training, hydrographic surveying and convoy escort duty.

A major influence in crew rest and recuperation is the provision of efficient ventilation. The B class MLs had no mechanical ventilation. Cowl and mushroom ventilators were provided throughout as well as 9 inch (230 mm) side scuttles which could be opened and fitted with wind scoops in calm weather or in harbour.

Two of the mess deck ventilators located at the side of the fore end of the wheelhouse consisted initially of 4 inch (100 mm) mushroom vents mounted on vent boxes. The flow of water over the deck in significant head seas was at such height that the mess deck below could be awash from flooding through the ventilators. They were eventually replaced by cowl ventilators.

In all sea conditions it is essential that crew can maintain efficiency with adequate rest and recovery of strength. It was often the practice for off-watch crew to retire to their bunks as the easiest means of resisting the effects of ship motion.

Prosecution of a correspondence course of study under such conditions involved sitting on a stool at a mess deck table with one arm wrapped round a stanchion to maintain balance.

No cook was carried in the complement, the duties generally being performed in rotation. After resistance to seasickness was established, this resulted in a position of sea cook by day and a relief listening watch for the sole telegraphist by night. Action station in a gun's crew continued.

The Attack class patrol boats were called upon to perform many and varied duties, like starting round-the-world yacht races. HMAS *Buccaneer* had that duty in 1975
(Photograph John Jeremy)

Apart from the difficulty of keeping the cooking utensils on the large kerosene range, despite the provision of keep bars, there was the risk of having a mixture of kerosene and methylated spirits burning on the corticene deck covering when lighting up in heavy weather. No galley fire was experienced, though a 100 octane fire in the mess deck caused some alarm on one occasion.

Fresh water capacity was 770 gallons (3500 L), sufficient for domestic use and washing. The fire hose provided a sticky substitute for showering.

CONCLUSION

The thirteen attributes listed by Bruce McNeice for improved seakeeping performance are all worthy aims. If the manned spaces are to be located close to midships or a little aft, and low in the ship, what use will be made of the space at the ends of the ship? The bridge and steering position will no doubt be located high in the vessel. What steps can be taken to minimise the effects of the ship motion here? Will the vessel be equipped with a crow's nest for vessel lookout?

The development of the new patrol boat specification will be watched with interest by one who still has vivid memories of his time in the B class MLs.

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INDUSTRY NEWS

Wärtsilä EnviroEngines for P&O Cruises

Wärtsilä Corporation is supplying twelve EnviroEngines for four cruise ships contracted by P&O Princess Cruises. All the engines are being built in Finland.

Wärtsilä EnviroEngines are the most environmentally friendly and economical way of using fossil fuel for power production. They employ electronically-controlled common-rail fuel injection to provide optimum combustion over the entire load range, to give the particular benefit of no visible smoke at any load and when starting or during transient load changes. They also employ electronically-controlled direct water injection to achieve the low NOx emission value of 6 g/kWh. These EnviroEngines for P&O Princess Cruises are the first to incorporate both technologies. As diesel engines, their high efficiency also means they have the lowest CO_2 emissions of all prime movers.

The choice of Wärtsilä EnviroEngines reflects P&O Princess Cruises' commitment to the highest levels of environmental protection. The smokeless operation of EnviroEngines is of particular attraction to P&O Princess Cruises, as it meets the need for a clear engine exhaust when operating in environmentally-sensitive areas such as Alaska. P&O Princess Cruises has worked closely with Wärtsilä over the last few years to support the development of these engines which represent the 'state of the art' in terms of diesel engine technology and reinforce P&O Princess Cruises' position as the leading innovator in the cruise industry.

The first eight Wärtsilä EnviroEngines, two Wärtsilä 9L46 engines, two Wärtsilä 8L46 engines and four Wärtsilä 16V46 engines, have successfully completed factory acceptance tests for Mitsubishi Heavy Industries, Chantiers de l'Atlantique and P&O Princess Cruises.

Two ships, *Coral Princess* and *Island Princess*, are building at Chantiers de l'Atlantique in France, with delivery scheduled in 2002 and 2003. They will each have two Wärtsilä 16V46 EnviroEngines, each delivering 16 800 kW at 514 RPM. When delivered, *Coral Princess* will be the first vessel to enter service with fully-fledged EnviroEngines.

Two ships, *Diamond Princess* and *Sapphire Princess*, are also being built at Mitsubishi Heavy Industries in Japan. They are due for delivery from the Nagasaki yard in 2003 and 2004 respectively. These ships will each be equipped with two Wärtsilä 9L46 and two Wärtsilä 8L46 EnviroEngines. The nine-cylinder engines are rated at 9 450 kW output each at 514 RPM and the eight-cylinder engines 8 400 kW at the same speed.

Twenty-seven Wärtsilä EnviroEngines of three different engine types have so far been ordered for sixteen ships and, in addition, low-speed engines with similar technology have been ordered for six further ships.

FROM THE CROWS NEST

Classification of HMAS *Wewak* by LRS

Landing Craft Heavy (LCH) vessel HMAS *Wewak* is the first Royal Australian Navy ship to use a classification society to help it meet the technical regulation system recently introduced by the RAN. Classed to Lloyd's Register of Shipping's new *Rules and Regulations for the Classification of Naval Ships*, she is also the first vessel to be awarded both hull and machinery classification under these Rules. HMAS *Wewak* has been classed ✠100A1 NS3 Landing Craft, SAR, ✠LMC, POL (for further details on the individual elements of this notation, refer to Classfinder at www.cdlive.lr.org).

'This milestone is an important step towards the RAN goal of further enhancing safety. The new regulatory system utilises the skills and expertise of classification societies to provide assurance that the RAN vessels are fit-for-purpose, safe to operate and environmentally compliant. This task has been completed with close and highly professional co-operation between Lloyd's Register and the RAN', said Captain Drew McKinnie, Director General Navy Certification, Safety and Acceptance Agency, Royal Australian Navy.

Beyond HMAS *Wewak*, Lloyd's Register is also working with the RAN to bring the remaining five LCH vessels and the landing ship HMAS *Tobruk* into class over the next twelve months.

Opening the international Maritime Conference Pacific 2002 in Sydney, Lloyd's Register Chairman David Moorhouse congratulated the RAN on its 'proactive drive towards minimising risks to safety, the environment and operations.' He said: 'The new RAN regulatory system aims to ensure that its vessels are designed, constructed and maintained throughout their life to appropriate standards. Lloyd's Register is very pleased to be working with the RAN to help it manage risks effectively'.

LRS Press Release, 29 January 2002

Maxsurf Upgrade

Maxsurf, the well-established suite of naval architectural software from Formation Design Systems, has recently been upgraded to Version 9. The upgrade adds several enhancements, including an improvement in speed and accuracy for all analysis functions. The Hydromax module now runs stability calculations approximately 40% faster.

Substantial effort has been invested in improving the transfer of data between Maxsurf and other programs via DXF and IGES files. DXF files benefit from more accurate calculations of contour points, and the IGES NURBS surface format has been improved to support a higher level of trimming information. In most cases, trimmed surfaces created in Maxsurf will import flawlessly into programs such as Mechanical Desktop, Microstation, Vellum Solids, Catia, Rhino and ProEngineer.

Hydromax has undergone the most significant changes,

including modifications for batch processing, an important feature when large numbers of load cases and damage cases need to be calculated. With a single batch-analysis command, it is now possible to run large-angle stability and equilibrium analyses for all combinations of load and damage. Criteria can be set and these are evaluated at the end of each analysis and accumulated in a report window. The upgrade also includes an extended range of downflooding point capabilities. Results are written to a text file which may be imported directly into MS Word or Excel for post-processing or report generation.

Multiframe Upgrade

Multiframe, the well-established suite of structural software from Formation Design Systems, has recently been upgraded to Version 8. The upgrade adds several enhancements, including the addition of VBA automation, a new system for creating Multiframe macros which are compatible with Word, Excel and AutoCAD 2000. This means that anyone can now write their own macros to create structural models, extract and sort results, do detailed design calculations and exchange data between programs. In addition, the visualisation capabilities of Multiframe have been upgraded to use the latest OpenGL 3D rendering capability. This allows users to sort and slice the structural model, and make transparent those portions of the model which are of less interest.

The core technology behind the automation is Microsoft's VBA (Visual Basic for Applications) macro scripting system. This is the standard method of automating repetitive tasks in MS Office and, as such, is used by many engineers to write macros in Excel or AutoCAD. The scripting syntax is simple and provides a familiar equation style which can be easily understood by engineers.

The practical outcome of automation technology is that engineers can now write design calculations in Excel which directly access structural section properties, results from analysis, geometry information and any other data which can be viewed in Multiframe. A user can prepare a design template for a document in Word, and have it filled out automatically by data from a Multiframe model. A range of Word, Excel, Access and AutoCAD sample files is included.

The new support for OpenGL rendering helps engineers quickly visualise whether the model is correct and which parts of the model are critical from a design perspective. Rendered 3D views are provided, complete with colour-coded numbers, transparency and real-time rotation, all operating at high speed, even on large models.

New Gun for Minehunters

Senior defence committees are shortly to sign off on a proposal to re-barrel the 30 mm guns fitted to Australia's new fleet of Huon-class coastal mineunters, in accordance with a new 25 mm standard. The initiative seeks to establish consistency with the guns fitted to the Army's fleet of light armoured vehicles (ASLAVs), thereby underpinning a viable Australian production run for locally-produced ammunition common to both services.

DIAR.com, 31 January 2002

Collins Combat System to be Refined

Australia's Defence Materiel Organisation has identified the core of the new combat data system for the six Royal Australian Navy Collins-class submarines. The DMO revealed recently that the basis of the replacement combat system will be a new version of the Command and Control System (CCS) Mk 2 developed by Raytheon, and will replace the STN Atlas Integrated Sensor Underwater System fitted to the vessels.

Development of the CCS Mk 2 will be undertaken by an integrated project team consisting of the US Navy, Raytheon, Thales Underwater Systems (TUS), the Australian Submarine Corporation and the DMO. An alliance has also been formed between the DMO and Raytheon Australia, TUS and Sonartech Atlas to refine the details of the replacement combat system built around the CCS Mk 2, which is understood to incorporate Scylla sonar arrays from TUS and acoustic processors from Sonartech Atlas.

The DMO is expected to complete an initial design study to determine the costs, risks, timing, and scope of the combat system solution in the first quarter of this year. A recommendation on the most appropriate equipment acquisition strategy will then be made to government.

Jane's Defence Weekly, 16 January 2002

RAN Patrol Boat Bids

The Royal Australian Navy's Project Sea 1444 replacement patrol boat competition is believed to have a total purchase budget capped at $428 million, including $4 million in contingency funds.

The Department of Defence confirmed on 10 December 2001 that it had received fifteen bids for the project from a total of nine prime contractors. Six prime contractors offered both direct purchase and private finance initiative bids, while three offered direct-purchase bids only.

A summary of the proposals shows the following:

- Australian Defence Industries: 52 m GRP monohull based on Danish Flex 300 vessel.
- Austal: 45 m aluminium monohull stretched version of own Bay class.
- Australian Submarine Corporation: 55 m steel monohull based on the HSDF hullform developed by the US and Netherlands Navies, with aluminium option.
- Babcock Defence Systems Australia/Strategic Henderson Marine: 54 m steel monohull scaled-down Irish navy patrol vessel.
- Forgacs: 53 m steel monohull Fincantieri's Saeitta class.
- Ilan/North West Bay Ships: Trimaran to own new design.
- NQEA Australia: 55 m steel monohull to own new design.
- Tenix Defence: 55 m steel monohull based on own Phillippines SAR vessel.
- Singapore Technologies Marine: 55 m based on own Fearless-class offshore patrol vessel.

For further details, see the article.

Asia Pacific Defence Reporter, January 2002

LRS Appointed Delegated Authority for MoD(N)

Lloyd's Register has been authorised by the UK Ministry of Defence (MoD) to undertake structure, watertight integrity and stability certification duties for the entire UK MoD (N) surface fleet. Full structural safety certificates for all support ships, including ships of the Royal Fleet Auxiliary and Hydrographic Service, can now be issued directly by Lloyd's Register. Partial authorisation has been granted for all other ships, and this includes front-line warships, several of which are already in Lloyd's Register class or are progressing towards entry.

LRS Press Release, 24 October 2001

Skyhawks bid Farewell

On 9 November 2001, the Royal New Zealand Air Force No. 2 Squadron (A4 Skyhawks) departed HMAS *Albatross*, Nowra, ending a long and fruitful association with the Royal Australian Navy Fleet. The squadron's departure was a result of the New Zealand Government's decision to disband the air combat element of the Royal New Zealand Air Force.

The departure marked the end of an era, with the familiar shape and unmistakable sound of the Skyhawks disappearing from Australian skies.

Navy News, 21 January 2002

Many DoD and ADI naval architects will recall the RAN's Skyhawks and the modifications required to the aircraft carrier, HMAS Melbourne, *to enable their safe use: the jet blast deflector, wheel loads, hook bounce, the flight-deck structure (both local and global), and the catapult upgrade, not to mention the sight and sound of a Skyhawk disappearing off the end of the flight deck before it gained full flying speed!* — Ed.

Engineering Excellence Award for NQEA Australia

The IEAust's National Engineering Excellence Award winners for 2001 were announced at an awards function on 21 November 2001 at Canberra's new National Museum in the presence of the Governor-General, Dr Peter Hollingworth and Mrs Hollingworth.

One of the six Engineering Excellence Awards was presented to Don Fry of NQEA Australia for their 84 m long 2900 m^3 capacity trailing suction hopper dredger delivered to the Port of Brisbane Corporation in October 2000.

The dredger, *Brisbane*, was constructed and commissioned at NQEA's Cairns shipyard. It incorporates current technology in dredger automation systems, unattended machinery spaces, and power-management systems which integrate with the ship's communications, propulsion, steering, and fire-protection systems. The ship features a fully-integrated navigation, dredging and electronic reading (FINDER) system. It uses GPS data to provide electronic navigation and three-dimensional models of channel design surfaces and existing surveyed surfaces. The draghead of the dredger is fitted with a swell compensator which maintains an optimum distance between the draghead and the seabed. It also regulates the downward force of the draghead and maintains the tension in the draghead rope to compensate for the sea swell. Since commissioning, *Brisbane* has removed over one million tonnes of spoil.

Engineers Australia, January 2002

'Oh my God! He's too low! — No, yes, no, phew!' The view from the quarterdeck of a Skyhawk landing on HMAS *Melbourne* was always a stirring sight. This young pilot was doing it for the first time one day in May 1974 (Photograph John Jeremy)

A HISTORY OF MORTS DOCK AND ENGINEERING CO. LTD

Keith M. Murray, CEng FIMarE MRINA FIMH

In the early 1850s Australian trade was centred mainly in the Port of Sydney. The settlement was to a large extent within the proximity of the harbour and the Parramatta and Lane Cove Rivers. The progress in the colonisation of the settlement since the arrival of the first fleet in 1788 had been a remarkable achievement. Exploration and discovery had proceeded to the north, south and west but commerce was still centred in the area of the original settlement.

There were several establishments doing engineering work building steam engines to operate the grain mills, as windmills were proving unreliable. So one cannot start to provide a history of Morts Docks and Engineering Co. Ltd reviewing the other organisations and personalities involved in the early days who, in some cases, provided the training ground and expertise which eventually formed the basis of Morts Dock. The names of those persons who contributed to the advancement of engineering in the colony are listed but not necessarily in chronological order.

John Struth arrived in the colony as a baby in 1804 and, at the young age of 19 years, erected Barkers Steam Mill, which was located on the corner of Duncan, Day and Steam Mill Streets. This site is now built over by the western distributor and the IMAX theatre. The author discovered the foundations for the steam engine when the Union Steam Ship Co. of NZ Ltd purchased the Robert Harper Building from McPhersons Pty Ltd and converted the building into an engineering workshop, stores department and Superintendents' offices. Struth was a remarkable person for his day and retired in 1855. On retirement he sold his workshops to Napier and Co.

It would appear that James Blanche established the first iron foundry in 1821, on a site in George Street where Grace Bros. is currently located.

As the business grew, he moved in 1831 to a site near Dickson's Steam Mill, adjacent to Goulburn Street. From all accounts the new establishment was well set up and capable of undertaking heavy work when judged by the standards of the time. Blanche died suddenly in 1841 and the works were sold to P. N. Russell. There is no doubt that in the 1840s, P. N. Russell's workshops, known at the time as the Sydney Foundry and Engineering works, was the most important engineering works in Sydney. The name P.N. Russell is still perpetuated in the prize list at the University of Sydney as a result of his donation of £50 000 in 1885 and a further £50 000 in 1904, large amounts of money in those days. The establishment of this fund was made because of his deep interest in the proper training and education of engineers. P. N. Russell and Co. was the most important training ground for engineers at the time in Australia. The list of those who commenced their career there is a real *Who's Who* of the profession and included Norman Selfe, A.J. Goldsmith, William Dunlop, J.P. Franki, Charles Halliday, J.C. Ludowici, and Thomas Scrutton — to mention possibly the most eminent. It was from this training ground that Morts Dock was eventually able to recruit its managerial and design staff. Russell also had a yard at Waterview Bay adjacent to the dock.

Another eminent person was John Cuthbert who, in about 1864, took over Alexander Fotheringham's patent slip, the first in the Colony. This was located at the foot of King Street. In 1851 this gentleman had taken over a shipyard established by a man named Corcoran for whom he had worked since 1848. Cuthbert had a good reputation and was entrusted with repairs to vessels from the Royal Navy. He also sub-leased Mort's Waterview Dock (completed in 1855) from the P&O Steam Navigation Co., who had the lease from T.S. Mort. Industrial problems during 1868 eventually caused the demise of the Cuthbert Yard and it closed down in about 1871. Eventually history was to repeat itself, with Morts Dock, partly for the same reason.

In 1833 Richard Dawson established the Australian Foundry in lower George Street and it appears that this organisation became the most important of its time in Australia. In 1853 a vessel arrived from the United Kingdom with stern-post damage and the hull leaking. As there was no dock in Australia able to accommodate the vessel (Morts Dock was not completed until 1855) Dawson constructed a watertight cofferdam around the stern, which allowed the repairs to be carried out afloat.

During World War II Morts Dock was faced with the situation of having too many ships requiring docking for repairs and other purposes. One of these vessels, the Adelaide Steamship Co.'s *Allara*, had received considerable torpedo damage to the stern which would have required tying up the dock for several weeks. This could not be allowed due to the need to keep vessels flowing through the dock, so it was decided to place the vessel in dock, fit a prefabricated steel cofferdam around the stern, then take her out and do the repairs afloat. At the time it was thought a very smart move and congratulations were made for the resourcefulness. It was not until the author became involved in research for the Institute of Marine Engineers book, *Work Horses in Australian Waters*, that it was realised we were not so smart after all. History only repeated itself.

Dawson was the pioneer machinist in Australia and his engineering workshop was equipped with machine tools for slotting, boring, turning, planing, punching and shearing. The works' foundry used up to 15 tons of metal per week. The business carried on after the death of Richard Dawson until it was purchased by Thomas Sutcliffe Mort, who then wound up the business, having already transferred the machinery to Waterview Bay.

There was another organisation which eventually had ties with Morts Dock in the early days, namely, the Australian Steam Navigation Company, originally the Hunter River Steam Navigation Company, which was formed in 1839. This company set up its own workshops at the foot of Margaret Street on Darling Harbour in 1845, but not much later the Works were moved to Pyrmont. During the period 1857 to 1867 Mr A. B. Portus stated that 'it was in the construction of marine boilers that the ASN Company chiefly excelled'.

For many years the boiler-making establishment of the company was absolutely unequalled in Australia. Later Morts Dock became a rival after John Fyfe Snr. left the ASNCo. Mr T. McArthur then took over the position of Works Manager. It was a very efficient yard and in January 1866 Mr T. McArthur, who by that time was the Superintendent Engineer for ASNCo, left to operate the Waterview Bay Dry Dock after the P & O/Cuthbert lease had expired. In 1885 the business was named T. McArthur & Co.

The British India Steam Navigation Company's subsidiary, Queensland Steam Shipping Company, entered the trade then operated by ASNCo., and one year later the ASNCo. sold out to the Queensland Steam Shipping Company, thus forming that well-known shipping company, the Australian United Steam Navigation Co. As the Queensland Steam Shipping Co. had a workshop in Brisbane, the directors of the ASNCo. disposed of the machine tools and the big slipway to Morts Dock in 1887.

During the foregoing time the volume of shipping had grown to such an extent that docking and engineering repairs were delaying shipping due to the lack of dry-docking facilities. The proposal for a dry dock in Waterview Bay had its origin with an approach by Captain Thomas Rountree to Thomas Sutcliffe Mort for financial assistance to sell his ship to build a slipway. Mort could see the potential of a dry dock in lieu of a slipway and this resulted in the formation of a partnership to build a dry dock. Mort invested £80 000 to build the dock eventually called Morts Dock.

Excavation work for the graving dock
(from *Mort's Dock, Fifty Years Ago and Today*)

At the time, Thomas Sutcliffe Mort was without equal. He was a far-sighted businessman with many interests other than his investment in the engineering and docking facilities at Balmain. He was born at Bolton, Lancashire, England, on 23 December 1816 and arrived in Sydney at the age of twenty-two. On his arrival he worked as a clerk with Aspinwall Brown and Co. and five years later at the age of twenty-seven set up on his own account as an auctioneer. He established Goldsbrough Mort and Co. and initiated public wool sales. He promoted the Hunter River Steam Navigation Company in 1841 and in 1849 the Sydney to Parramatta private railway project. He also floated the Great Nugget Vein Mining Company. These projects brought about his investment in the docking and engineering field which opened for business in 1854. In addition to the foregoing interests, in 1856 he realised the potentialities of the dairying industry and established a farm of 38 000 acres at Bodalla in the Moruya district. Records show that Mort set up a new meat industry at Lithgow, which was opened on 2 September 1875. At the dinner held to commemorate the occasion, the guests were fed on meat which had been frozen for some time, with very good results.

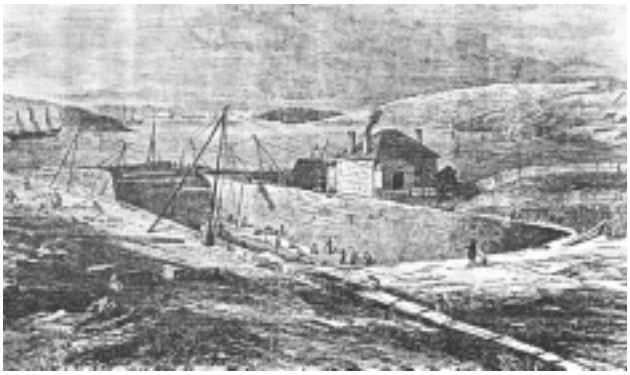
Other interests were Peak Downs Copper Company, Queensland, and Waratah Coal Mining Company, Newcastle, but the most important was his interest in the shipping of frozen meat to the United Kingdom. Although his first experiment did not succeed, there is no doubt that he was the pioneer in the field. Many of us can no doubt remember the freezer works which were known as NSW Fresh Food and Ice Co. Ltd which was located in the Darling Harbour area.

Thomas Sutcliffe Mort passed away at the age of 63 on 9 May 1878 at his Bodalla residence after a short illness. He had contracted a chill at a friend's funeral. Mort was buried in the churchyard of the church which he built at Bodalla. It is of considerable historical interest and well worth a visit.

A statue of him was commissioned and now stands in Macquarie Place in the historical place where Captain Phillip proclaimed the foundation of the Colony of New South Wales.

This story shows how one person with foresight could support the establishment of an engineering and dry docking facility, even though not trained in that field. He was without a doubt, the Colony's first major investor and a particularly far-sighted person. Despite his contribution to Australia, it does not appear that he received any royal honours.

Following the original suggestion by Rountree for a slipway, Mort could see the added advantage of a graving dock and suggested that they enter into a partnership. The joint venture proceeded and the dock was ready to receive its



The excavation as completed in 1855
(from *Mort's Dock, Fifty Years Ago and Today*)

first vessel, the Russian barque *Challenger* on 1 January 1855. The original dock was 365 feet (110.6 m) long, 70 feet (21.2 m) wide at the top and the depth of the dock was 20 feet (6.1 m) from the top of the keel blocks.

The dock was cut into almost solid sandstone, the prevailing material in the area. The stone removed was used to form the dock entrance and sections of the dock sides. Altars were formed along the dock sides. This is a stepping of the dock sides to provide a platform for the side shores. These support the vessel laterally when sitting on the keel blocks.

A vessel should, when entering a dock, be upright and on as equal draughts fore and aft as possible so that when the caisson is placed in position and the centreline of the vessel

aligned with the centreline of the dock blocks, the dock can be pumped out, a task which usually takes approximately five hours. During this time the marine growth is scraped from the ship's hull. As the vessel touches the keel blocks, the side shores are placed in position on the altars and secured in place by means of wedges. The shores should always be placed on a section of the shell plating, in the case of iron or steel vessels, supported by internal ship's structure and, in the case of wooden vessels on the side planking in way of the frames. The caisson at Morts Dock was of a type that did not rely on pumping out the ballast water. In order to explain the principle on which the caisson operates, it is assumed that there is a ship entering the dock on the tide and the caisson is floating in an area clear of the dock entrance. The ship is brought into the dock and lined up using its mooring lines and the caisson brought into position. The valves in the caisson are opened, thus allowing it to sink into the fit at the dock entrance. The dock pumps are started and, as the water is removed from the dock, the caisson is held against the fit by the pressure of water on the outside face of the caisson. Once the dock is dry, the ballast water in the caisson can be drained into the dock and the valves closed. When it comes time to undock, the flooding gates are opened and when the water inside the dock is at the same level as outside, the caisson floats clear ready for the next docking.

The dock was lengthened to 650 feet (197 m) in 1897, just two years before the author's father commenced his employment in the Company as a 'boy' in the office. The P&O Steam Navigation Company also helped develop the area surrounding the dry dock with its bunkering station, workshops and ship's stores. This laid the foundation for an in-house repair establishment. With the advent of the employment of Mr T.M. McArthur to manage the workshops, which was mentioned earlier, the company became known as T. McArthur & Co. Considerable progress was made under his leadership.

Activity at the dock increased greatly and in 1867 Ship No. 1 was built, an iron vessel named *Pioneer* for R. Towns and Co. The same year SS *Thetis* of 263 tons (267 t) was designed, constructed and engineered for the NSW State Government. In appearance she was very similar to *Captain Cook I,* built at Morts Dock, which was the original pilot steamer in Sydney Harbour. She was reputed to be the first dedicated pilot steamer in the world, and was replaced some years later by *Captain Cook II*. In 1868 a ferry *Platypus* was completed for the Parramatta River Company.

Earlier mention was made of the names of famous engineers who were trained in the P.N. Russell Workshops. One of these was J.P. Franki who had started as an engineering draughtsman and was enticed to join the then T. McArthur and Co. On the death of McArthur, Franki was appointed manager and said shortly after assuming the position: 'It soon became clear to me that, however great the promise of the future, the shipping using the port in the early seventies did not provide sufficient work to keep the workshop fully occupied in maritime activities, thus requiring the organisation to diversify'.

Franki, whilst employed by P. N. Russell, had had considerable experience with mining machinery and railway rolling stock as well as sugar mill castings and, accordingly, was able to broaden the firm's activities. According to the Memorandum and Articles of Association, on 22 January 1875 the name of the establishment was changed to Morts Dock and Engineering Co. Ltd, thus forming a public company. Prior to 1875 Mort endeavoured to persuade the workmen to become fellow shareholders on very favourable terms and, to quote his words: 'That I as a capitalist and you as workers should be bound together by a common tie with the cords of a common interest'. This offer was taken up by quite a number of the employees whose occupations in the articles are listed as boilermaker, shipwright, blacksmith, and engineer. Mort, as the principal shareholder, was managing director, with J.P. Franki general manager.

Franki was a remarkable man and the driving force during his time at the yard. He did not retire until 1923 and the author can still remember the man when, as a young boy, he visited the works on a Saturday with his father. On Franki's retirement a function was held which the author's father attended. He told of an occasion when Franki was being taken over to Erskine Street in one of the firm's steam launches. This was his daily practice at lunchtime. These launches had a thwart dividing an open space into two sections forward of the boiler/engine and covered passenger space. The forward portion was for the carriage of cargo, etc., and the after space was a coal bunker for the boiler. Under the thwart and side benches there were water tanks for the boiler. It was the habit of Franki to stand on the thwart when the launch was berthing, so that he could leap ashore easily when the

Morts Dock in 1908
(from *Mort's Dock, Fifty Years Ago and Today*)

launch came alongside. The launch being used was fitted with a single cylinder steam engine, which, although fitted with a flywheel, had a tendency to stick on bottom dead centre, making it impossible to manoeuvre until the driver turned the flywheel slightly. On this occasion Franki was standing in his usual position ready to alight at the small public wharf, which was to the south alongside the Erskine Street ferry wharf when the engine stuck and would not go astern. The launch hit the wharf, and Franki landed in the coal bunker.

The author does not know if he continued on to his lunch with the other members of the shipping fraternity, but he does know that when Franki returned to the works his father was told to sack 'dat man'. This did not occur, as Franki had a change of heart shortly after. Franki was also interested in training and education, probably acquired from P.N. Russell, and he established the Franki Memorial Prize at the works and Sydney Technical College.

Under Franki's management a considerable amount of diversification occurred. Following his retirement in 1923, he was retained as a consultant and Mr T.H. Silk was appointed to the position of managing director. He had been recruited from the Belfast shipyard of Workman Clark and Co., North Yard, where he had been employed as assistant shipyard manager. At one time he had been the President of the Belfast Association of Engineers. Mr Silk then appointed Mr R.R. King as general manager, who remained in that capacity until he retired in mid-1929. Unfortunately, he did not live long to enjoy his retirement, passing away in October 1929.

One of the first developments which Silk ordered on assuming office was to have a hammerhead crane built and positioned at the dock-head of the Balmain dock (this crane is still in use at Goat Island). Mr John King (son of R.R. King) who was the manager of the Chapman's Branch was appointed to the position of general manager at Morts in 1929, and Mr John Crawford was taken from the drawing office to manage Chapman's Branch. However, in 1933 Crawford replaced John King at Morts, with John King returning to his old position at Chapman's Branch. In early 1944 Silk went to the United Kingdom for specialist medical treatment, returning in July 1944.

On a personal note, and on the subject of the steam launches operated by the dock, it was the author's good fortune to be taken by his father into the works during school holidays. This commenced from the time he was nine or ten years old and continued until starting work at fifteen-and-a-half years after passing the Leaving Certificate examination. This period of the author's life was not only enjoyable for someone interested in engineering, but most educational so that when he eventually commenced his apprenticeship, engineering terms and principles of operation of steam engines and boilers were not by any means new.

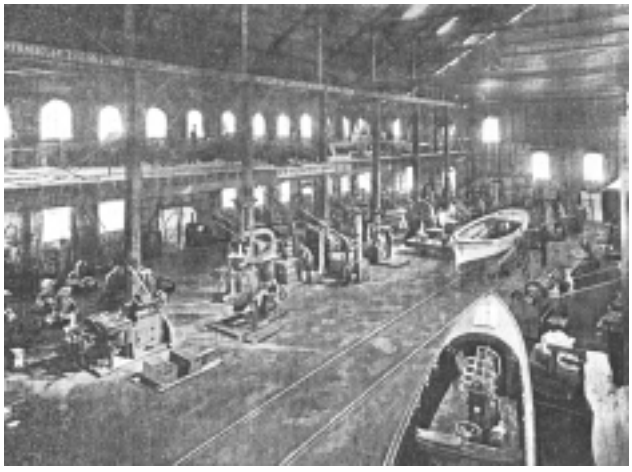
The author's father spent over fifty years with the firm before retiring in 1949, just after the author resigned to join the Union Steam Ship Co. of NZ Ltd.

The diversity of work carried out by Morts was considerable. During the time when the author first started to go to the works as a boy, and then later as an employee, it was of considerable interest to see steam locomotives, tenders for the 57-class steam locomotives, cranes, sections of bridges, electric trams and light aircraft repairs (this was carried out in a workshop in an area known as 'the sheer legs wharf'), stationary steam engines, boilers of various types, large pumps for the Water Board and winding winches for mines, coal and ore-handling equipment, both in Newcastle at the

The Jubilee Floating Dock
(from *Mort's Dock, Fifty Years Ago and Today*)

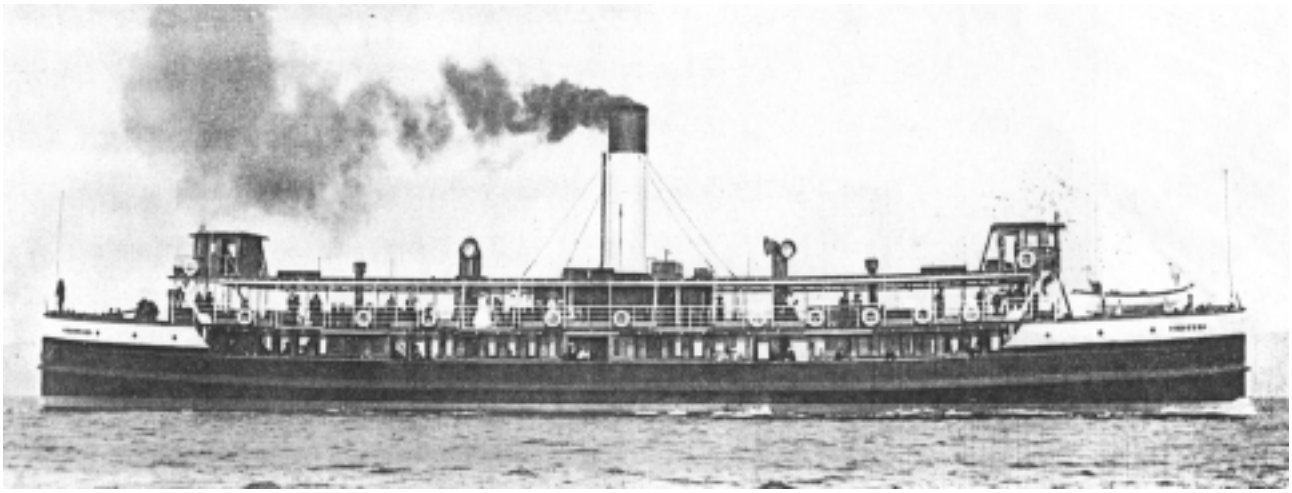
steel works and Bunnerong Power House. One notable job was the lifting equipment for the Ryde Road Bridge. The main business of the firm was ship repair and shipbuilding, and for the latter, the complete design and manufacture of every section of the vessel. The versatility of the dock was not surpassed by any other establishment in Australia.

In 1889 Morts took over the Jubilee Dock, which considerably increased the capacity of Morts Dock to service the shipping requirements of the port. They then acquired the Atlas Engineering Company at Woolwich and the Woolwich Dock was completed in 1901. This establishment then became known as the Woolwich Branch. There were two large building berths and a workshop where the motor department built the popular Invincible land and marine engines as well



The motor department workshop
(from *Mort's Dock, Fifty Years Ago and Today*)

as gas producers. Woolwich Dock, which was lengthened to 850 feet (257.6 m), could dock the largest vessels in the World at that time, it is still in existence as a wet dock. This dock could be revitalised with the building of a caisson (the old one is still in existence), repairs to the fit, together with



The Manly ferry *Binngarra* was built at Woolwich and completed by Morts Dock in 1905
(from *Mort's Dock, Fifty Years Ago and Today*)

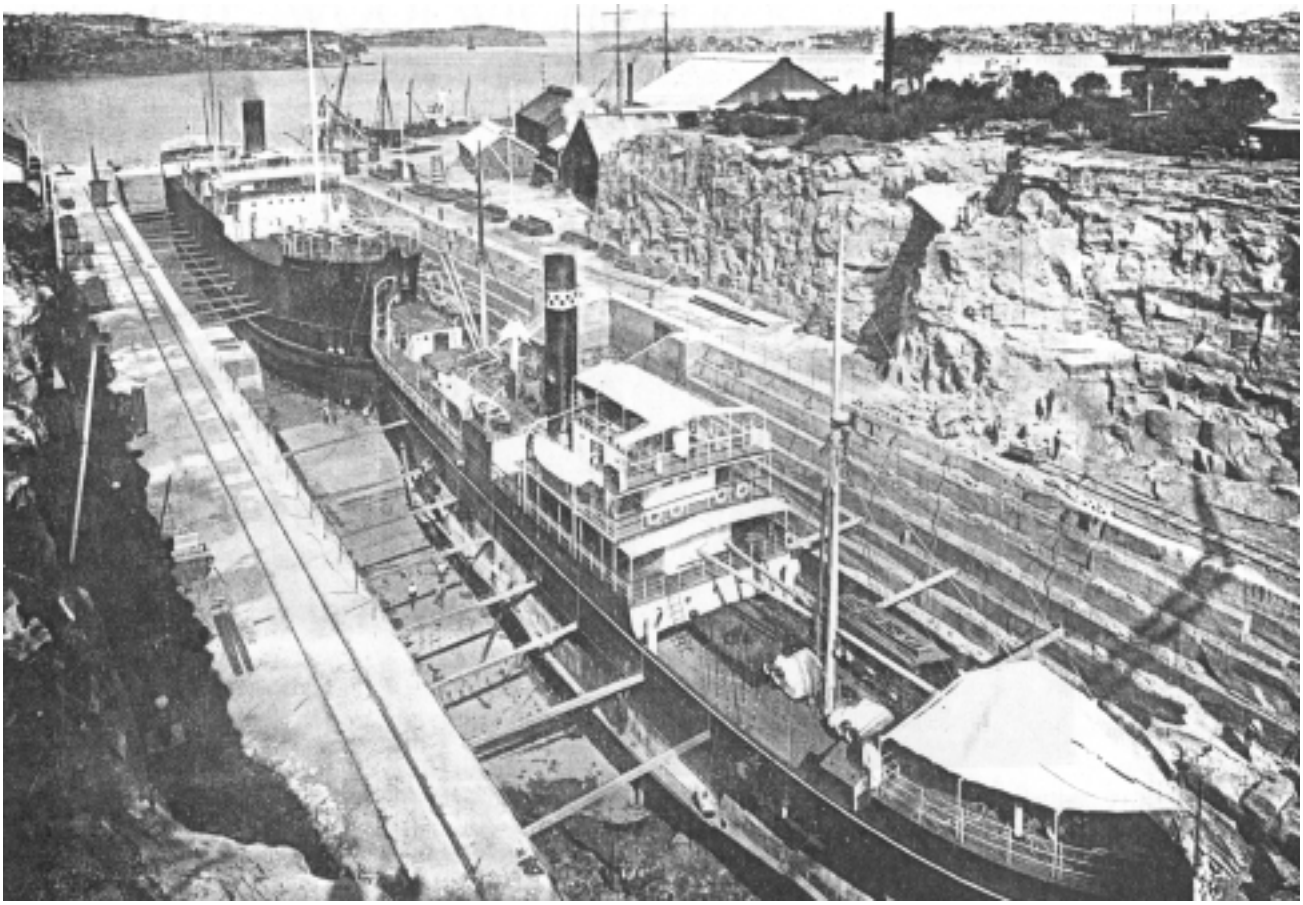
keel blocks and the installation of pumps, and could again be a dry dock.

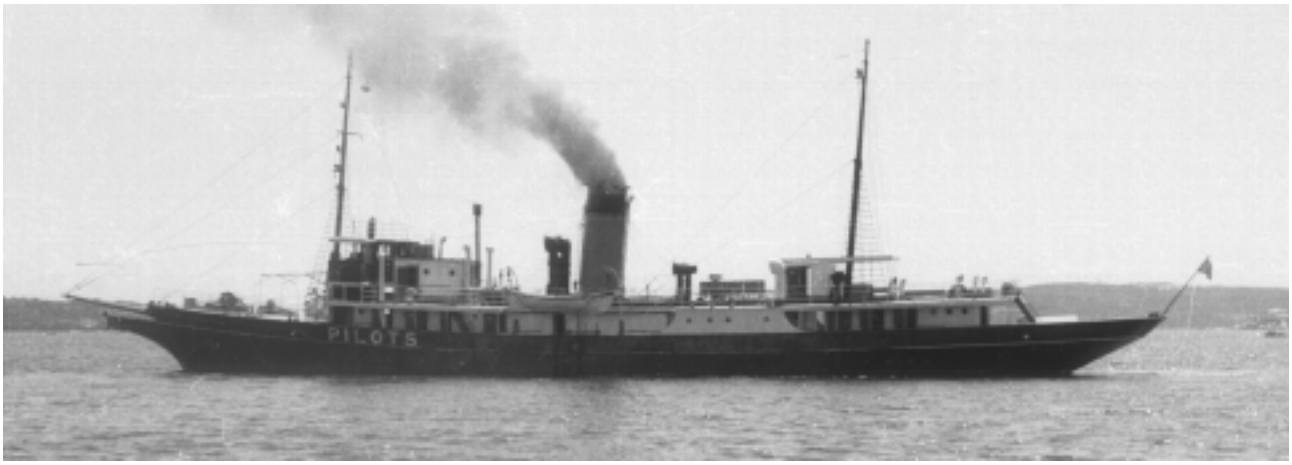
Morts Dock built all the Manly ferries until the arrival of *Dee Why* and *Curl Curl*. The last was *Baragoola*, which is still afloat today at the old Adelaide Steamship Co. wharf in Morts Bay.

During World War I the Federal Government ordered two oil barges for the RAN, but Morts did not build anything else. However, the dock was busy servicing and repairing the considerable merchant navy fleet then in existence. At the end of the war there was no share for Morts in the big Government shipbuilding program and they had to exist between the wars on general engineering and ship repair work. A dredge, *Matthew Flinders*, was completed just after World War I for Melbourne and the author's uncle, who had just completed his apprenticeship, joined her as a junior engineer for the delivery voyage. In 1924 Morts bought Chapman's Slipway, who also had a workshop in the city and then, a year later, bought Rountree's Floating Dock.

Around this time Morts built eleven ferries, including three waterbuses for the Parramatta River Service: *Swan*, *Pelican* and *Crane*. The author was working as an apprentice on the marking-off table at construction time of these waterbuses and can remember the problems associated with their op-

The Woolwich Dock, almost completed
(from *Mort's Dock, Fifty Years Ago and Today*)





The pilot steamer *Captain Cook*, completed by Morts Dock in 1939
(Photograph John Jeremy)

eration quite well. On this occasion Morts did not design the waterbuses, but worked on plans supplied by others.

In the author's opinion, the most beautiful ship constructed at Morts Dock was the third *Captain Cook*. She was built during the later part of 1938 and handed over to the Maritime Services Board in early 1939. At this time the author was in the drawing office in the final year of his apprenticeship and was very fortunate to be given quite a number of construction drawings to produce. The main drawing, however, was the 'as fitted' general arrangement. This vessel was a mixture of old and modern construction, with more of the old than the new. The MSB technical people were the decision-makers in this regard. The vessel had a single 18 ft (5.45 m) diameter Scotch boiler and an old-fashioned design triple-expansion steam reciprocating engine, open-fronted with guides on the back columns. The centre of gravity of these two components proved a problem for the drawing office and resulted in the lines of the vessel being broadened in way of the boiler due to its large diameter. Due to the high centre of gravity it was necessary to put ballast under the boiler to improve the vessel's stability. This created a further problem with trim. It was earlier stated that the vessel was a mixture of old and new. A small steam turbine drove the electric generators, she had an electric bridge/engine room telegraph and, believe it or not, the steering was by means of rod and chain with the steering engine in the wheelhouse.

During the four to five years prior to World War II, the machine and fitting shops, boiler and blacksmith shops underwent a rebuilding program. The cement lining and pipe shops (the pipes were for the Warragamba pipeline) were completed during the earlier part of this period. The iron and brass foundries were reconstructed and modernised and a metallurgist was employed.

Another improvement was made to the sheer legs wharf, which was completely rebuilt and fitted with a travelling crane. This work was completed during the early stages of World War II.

The machines in the machinery shop were fitted with individual motor drives. With the outbreak of war there was a tremendous increase in activity. It will be recalled that in the early stages there was a stalemate in Europe, and Japan had not entered into the conflict. This gave the Allies time to get their act together. The author recalls being given, during the first week after war was declared, the job of converting three steam trawlers to minesweepers, the guidelines being a small photostat of a typical steam trawler conversion. Time did not permit the preparation of drawings and these three vessels were converted by means of rough freehand sketches supplied directly to the foremen and leading hands concerned.

The job was completed in two weeks. This was followed by the conversion of many Australian coastal passenger vessels as troopships. Guns were installed on the poop decks of the merchant vessels, which required gun stiffening and accommodation for the gun crews. The Shaw Savill passenger liner *Arawa*, an ex-Australian Commonwealth Line 'Bay Boat', came to Woolwich Dock and the job of converting her to an armed cruiser was given to the author. This was a somewhat easier task to handle as the vessel had been designed, as were all the 'Bay Boats', for such a mission should it be necessary. This task took three months and one might wonder how long it would take today.

The next major job was the conversion of the coastal passenger vessel *Westralia* to an armed merchant cruiser, similar to the *Arawa*. Unfortunately, this vessel had not been designed for conversion and the author was seconded to the Garden Island hull drawing office together with Mr Gilbert Gray, then Morts' naval architect, to produce the arrangement plans and other details for the vessel. When these were completed and approved, Morts' draughtsmen prepared further detailed gun stiffening plans, etc. whilst the author was placed in charge of the fitting out of the vessel. Despite the vessel needing to have all this additional work carried out, it was also completed in about three months. During this time the yards at Chapman,s, Woolwich and Morts, Balmain were fully occupied in servicing the merchant ships together with the fitting of degaussing cables, paravanes, bridge protection, life rafts, etc.

During this period more vessels were fitted out as troopships, including many from overseas shipping companies. The necessary work was supervised by many of the drawing office staff.

In 1939/1940 the Naval Board decided to proceed with the building of a class of small ships first known as Local Defence Vessels (LDV) and later as Australian Minesweepers

(AMS). They were commonly known as corvettes. These were the Bathurst class and they were designed to be readily constructed by the various shipyards in Australia. The plans for them were produced by Cockatoo Docks (which had excellent facilities) and then sent to the Naval Board for approval before being returned to the various shipyards who were building the vessels. This was a time-consuming operation, which did not suit the management of Morts Dock nor the naval overseers at the dock. It was arranged for the author to go periodically to Cockatoo to take delivery of the drawings as they were produced and return to Morts to place the work in hand. This method enabled the dock to hand over its first ship, *Lismore*, to the RAN on 20 January 1941, only six weeks after the first of the class, *Bathurst*, was completed at Cockatoo Docks.

Altogether fourteen corvettes were constructed at Morts, twelve for the Australian and British Navies and two for the Indian Navy. Morts built more corvettes than any other shipyard in Australia. Due to the advances made in the type of mines being used by Germany and the advances in the use of radar, asdic (sonar), etc., there were constant changes on each vessel built. Some of the armament on the earlier vessels came from stocks held over from World War I. The first vessels produced had steam reciprocating engines with a total of 1 740 IHP (about 1 130 kW at the shaft) but later the engines were increased to total 2 000 IHP (about 1 300 kW at the shaft.

HMAS *Deloraine* was completed in November 1941
(Photograph John Jeremy Collection)

Morts were the lead yard for the Indian Navy corvettes. These had to accommodate the cultural differences of the crew by having two galleys and special ablutions. The author recalls one incident with the curry stone. One of Morts' ship joiners had made a wooden and steel stand in the galley to secure the stone and was proud of his achievement. Several days later when walking past the galley he noted that the cook had removed the stone from the stand and was down on the deck on his haunches grinding the spices.

Morts took thirty-three and a half months to build the fourteen corvettes. This represented one ship every two and one third months, from the laying of the keel plates for HMAS *Lismore* on l March 1940 to the completion of the last on 18 December 1942. When the programme was in full production there were two building slipways occupied, plus the top end of the Balmain dry dock for the building of the hulls, with two vessels at the fitting out wharf. There was a great cooperative attitude by the work force coupled with a pride in the job they were doing and, to use the words of an author of books on the corvettes, 'We all regarded Morts' ships as the best. We were sure that the craftsmanship and other skills that go into shipbuilding were so much better in the Morts' ships, which were better finished and had refinements that others lacked'. That these comments were made by one of the sailors who manned these vessels gives one a good feeling that the workers' efforts were appreciated.

At the conclusion of the corvettes, the River-class frigate programme was commenced. These vessels were much larger than the corvettes and were fitted with considerably more equipment. Four of these vessels were built with the first, HMAS *Gascoyne*, being the lead vessel of the frigate programme in Australia. They were propelled with four-cylinder triple-expansion steam engines with two LP cylinders, the engines turning at approximately 184 RPM, giving a speed of 21 kn. In the meantime, as a part of the shipbuilding programme, the yard built two oil fuel lighters, three 93 ft (28.3 m) diesel tugs and two battle-practice targets. On the repair side, there was a continual stream of vessels coming into the dock, the most notable being the *Bishopsdale* and *Alhena*.

The *Bishopsdale* was a RFA tanker which had been subject to torpedo damage. The torpedo went in one side and out the other at about the mid-length of the vessel, causing the hull to hog. The Navy suggested that the hog be left in, the hull plated up to secure the internal structure, and a false keel fitted for dry docking purposes. The head boilermaker foreman, Bill Northey, a very forthright and practical person, did not like the idea and made it known by saying that he could straighten the vessel and carry out a permanent repair. This was achieved in less time than had been estimated for the temporary repairs.

Alhena was an American cargo vessel, also with torpedo damage, in this case in the after hold. Again the torpedo had gone in one side and out the other and, in doing so, had bent the vessel horizontally about a metre to starboard. The stern section was cut free all the way round and, with tackles secured to the upper and lower part of the stern structure and with steel plates on top of the dock keel blocks, it was aligned with the forward section and plated up. Altogether, these were two very successful jobs.

With the easing and, finally, the end of the war in Europe, there was an influx of vessels from the Royal Navy including aircraft carriers, destroyers and submarines, which were refitted and repaired as required. This work was most interesting and gave the author and workmen a new dimension to the shipbuilding programme. A floating dock was also built which is still in use at Garden Island.

After the war there was still a tremendous amount of activity, mainly refitting vessels following war service, and permanently repairing those which had suffered damage and had been only temporarily repaired. One of the latter was the Burns Philp vessel *Mangola*, which had been driven ashore on the Barrier Reef by a cyclone. Most of the double-bottom tanks had been partially filled up with cement to enable the vessel to be kept in service. The problem was to remove the cement. The bottom plating was removed by burning out the rivets, which exposed the concrete. An attempt was made to remove the concrete with jack picks but

this proved to be very slow, so the foreman (who had experience with explosives) removed the concrete in very quick time without further damage to the vessel. There were some anxious moments with the first charges.

The dock also manufactured the steelwork for two River-class cargo vessels together with the main engines. The ships were assembled at the BHP shipyard at Whyalla. This decision was brought about by the lessening of the workload in Whyalla, and Morts having more work than could be handled at the time.

The largest individual job undertaken by Morts after World War II was the refitting of the trans-Tasman passenger vessel *Monowai*, owned by the Union Steam Ship Co. This entailed a complete redesign of the vessel internally and externally, and it was felt to be the largest single shipping project undertaken in any shipyard in Australia. At the conclusion of the rebuilding, the author sailed on the delivery voyage to Wellington, New Zealand, as the Morts Dock representative. *Taiping*, a vessel owned by the E&A Line, was also refitting towards the end of the *Monowai* task. This was also a reasonably-sized job.

Following the refitting of these merchant vessels, the yard built two 6 500 ton (6 600 t) B class motor cargo vessels for the Australian Shipbuilding Board at Woolwich, which were the subject of considerable industrial unrest resulting in late delivery. This caused the cancellation of two additional B class ships. In addition, two oil barges of 1 200 tons (1 220 t), and the steam tug *Batman* for Howard Smith's operations in Melbourne were built. The tug was fully designed and constructed by Morts. A heavy lift floating derrick crane was designed and constructed for the Darling Island Stevedoring and Lighterage Co. New equipment and more modern and larger machines had been purchased, which made the establishment one of the best-equipped engineering works in Australia, with the capability of handling work from design to the complete manufacture of the final article.

May 1954 was the 100th anniversary of Morts Dock and the event was celebrated with a dinner and entertainment at the Sydney Town Hall.

Mr T.H. Silk retired in 1957 from the position of managing director. Despite his poor health, he survived until 21 February 1976. He was succeeded by Mr Nottidge, who called in a firm of management consultants shortly after he took over. These people then proceeded to introduce a system of recording the progress of work throughout the firm and selected some of the best tradesmen to perform this task. This depleted the various departments of personnel who were good producers, turning them into overhead costs and, in the author's opinion, added to further losses in the company's operations. This, coupled with the militancy of the workforce, which in many instances could be attributed to poor management control, brought about the demise of the company. The gates were closed on 12 November 1958 and at a meeting of shareholders on 16 January 1959, they decided to wind up the company and called in the liquidators. The liquidators knew at that time the assets of the company exceeded the liabilities.

Thus passed into history one of the best training and engineering establishments of its time. So, despite the foresight of Mr Thomas Sutcliffe Mort and the excellent management style of Mr J. P. Franki, who gave fifty years' dedicated service to build up the organisation, all was unfortunately lost.

REFERENCES

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Family records of the author.

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Morts Dock, Fifty Years Ago and Today, NSW Country Press Co-operative Company Limited, no date.

The River class frigate HMAS *Macquarie*, completed on 7 December 1945, was the last warship built by Morts Dock (Photograph John Jeremy Collection)

PROFESSIONAL NOTES

NSCV Major Elements Ready for Endorsement

The national Marine Safety Committee (NMSC) is submitting major elements of the new National Standard for Commercial Vessels (NSCV) to the Australian Transport Council (ATC)for endorsement at its first meeting in 2002. NSCV elements being submitted to the ATC through the Standing Committee on Transport include:

- Part A — Safety Obligations
- Part B — General Requirements
- Part C Section 5 — Engineering (Subsections 5A, 5B, 5C and 5D)
- Part D — Crew Competencies
- Part F Section 1 — Fast Craft (Subsections 1A and 1B)

Regulatory Impact Statements accompany each of the sections.

The sections are expected to be implemented progressively by marine authorities around Australia from later in 2002.

NMSC 's approach to legislation requires ATC endorsement of drafting instructions to enable parliamentary counsel to prepare nationally-consistent legislation for NSCV implementation.

Industry has been kept informed on NMSC progress on the new commercial standard through quarterly newsletters, the NMSC 's website, public consultation, industry briefings and workshops. In addition, NMSC has sought advice from its former Industry Advisory Panel and has used reference groups with industry participants to review and comment on the sections during their drafting.

Responses to public comment are available through NMSC's web site www.nmsc.gov.au.

Fast Craft Workshop Identifies Hazards

NMSC is to release the findings of a workshop held in September 2001 on fast craft hazards that has called for the introduction of specific F2 Category safety standards.

The workshop concluded that there were many hazards associated with Category F2 fast craft that were not adequately regulated by conventional commercial vessel standards. These vessels may be best described as domestic fast craft, working in and around Australian coastal waters as tourist vessels and fast ferries. For example, those operating in Strahan in Tasmania, the Great Barrier Reef, Sydney Harbour and Rottnest Island.

It found that risk levels for Category F2 fast craft have the potential to significantly exceed those achieved for conventional commercial vessels and proposed that specific F2 standards were needed to introduce the additional control measures considered necessary.

It supported the concept that proposed F2 standards should be determined by the five dominant risk drivers identified — speed, number of passengers, area of operation, vessel design, and mode of operation.

The report on the workshop's outcomes and findings will be available on the NMSC's website and through the NMSC secretariat.

New fast craft category being considered

NMSC is considering creating a new, third category of fast craft (F3) following public comment on the draft National Standard for Commercial Vessels, Part F, Section 1: Fast Craft. The consideration follows the views of a reference group comprising industry and government representatives which assessed the public comment.

The reference group found that the public comment raised a number of differing points of view on which vessels should be subject to special fast craft requirements, in particular vessels of less than 35 metres in length and carrying up to 12 passengers. As a result, it recommended that these vessels be considered in a third (new) category of fast craft, Category F3. NMSC is considering the reference group's recommendation.

Safety Lines, December 2001

Phil Helmore

Engineers' Salaries

Average salaries of professional engineers rose by 4.7% over the past twelve months, according to the latest Professional Engineer Remuneration Survey. The survey was carried out jointly by IEAust and APESMA. Base salaries rose on average by 5.5% in the private sector and 3.8% in the public sector. The manufacturing sector reported increases of 5.7% and the non-manufacturing sector 4.5%. The oil/gas and industrial machinery industries had the highest increases at 8.1% each, with civil engineers the lowest at 3.9%.

Further details of the results, including breakdowns by type of work and years of experience can be viewed on the IEAust website www.ieaust.org.au. Go to the members' zone and click on engineering salaries on the welcome page.

Another survey, focussing on graduate salaries was also released in December 2001. The Graduate Careers Council of Australia's Graduate Destination Survey showed that median starting salaries of Bachelor of Engineering graduates aged less than 25 in their first full-time position is $40 000. Engineering has the fourth-highest starting salary among bachelor graduates across all fields of study. It is placed behind those in the dentistry, medicine and optometry professions, and equal to computer science graduates. The median starting salary for graduates across all fields is $35 000. The study also indicates that female graduate engineers, on average, earned $500 per year more than male engineers.

Further information on the survey can be found at www.gradlink.edu.au.

NAVAL ARCHITECTS ON THE MOVE

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

Bronwyn Adamson, a recent graduate of The University of New South Wales, has moved on from Bass and Flinders cruises and has taken up a position as a naval architect with Stewart Marine Design in Cairns. She was thrown in at the deep end, doing a survey in Port Douglas within hours of arrival, and then supervising an inclining and designing lifting gear when she got back!

Tony K. Armstrong (i.e. the younger!) has moved on as a result of the joint venturing of the ship management services of BHP Transport and Logistics with Teekay Shipping and has taken on a new role as Ship Manager with Teekay Shipping. He expects to continue working from the Melbourne office in the short term, but will move to Sydney within the next six months.

Bill Boddy has taken up a position in the Quality Assurance Section of the Ship Repair Contract Office at ADI, Garden Island.

Tom Boddy has taken up a position in the Contracts Section of the Ship Repair Contract Office at ADI, Garden Island, while he completes his degree in naval architecture at The University of New South Wales.

Peter Crosby has moved up in the ranks and is now a Commander in the Royal New Zealand Navy.

Frank d'Abrera moved on from M.J. Doherty and Co. in Sydney many moons ago, then worked overseas for one of the big oil companies, and has now taken up a position as Project Manager for J.P. Kenny in Perth.

Lina Diaz has moved on from her position as a surveyor with Bureau Veritas and has taken up a position as a naval architect with the Waterways Authority of NSW in Sydney.

Rigby Gilbert has moved on from his position as Anzac Ship Platform System Manager in Canberra, where he has been for four years. As part of the Defence Materiel Organisation relocation/reorganisation, he has moved to Rockingham, and has taken up the same position but within the Anzac Ship Alliance. The Alliance is responsible for developing all changes, i.e. providing the "generation" function, to the Anzac Systems Program Office Director.

Glenn Green recently had a change of scenery when he moved on from HMAS *Darwin* and joined the Anzac-class frigate HMAS *Arunta* as the Marine Engineer Officer. The ship is currently undergoing maintenance at the Tenix yard at Henderson in WA, with some of the tasks underway including tank and hull survey work, CPP maintenance, both A-bracket bearings being replaced and some hull repairs.

Nick Hutchins, a graduand of The University of New South Wales, is back working at Team New Zealand in Auckland, He was originally employed for the duration of the summer sailing program but has now joined the design team at least until the America's Cup match in March 2003. Nick says he is chiefly working on CFD, but there is plenty of more practical design work to keep him busy in the down time and, needless to say, there is no shortage of excitement.

Gerard Kenny recently returned to Australian Maritime Technologies in Melbourne from Hamburg, Germany, where he took part in AMT's rotation scheme with the German shipbuilder Blohm and Voss.

Dougal Loadman has moved on from Sinclair Knight Merz at Malvern, Victoria, providing technical input for the Anzac-class frigate construction program, and is outward bound for the UK, where he will look for work.

Scott McErlane has moved on from the Waterways Authority of NSW, spending a couple of weeks with friends in Singapore, a couple more with friends in London and, as we go to press, should be looking for a cushy job on a mega-yacht in the Mediterranean.

Adrian MacMillan moved on within Det Norske veritas about two years ago, and has taken up a position in the Deepwater Technology division in Houston, Texas.

Richard Pudsey moved on from his position as a surveyor with the Marine Safety Agency in New Zealand in 1993, and has been installing satellite TV antennas ever since.

Adam Solomons bounded outward nearly a year ago on a round-the-world trip. However, he was sighted in Sydney recently (back for his sister's wedding) and says that he is working as a Riser Analyst for a small offshore engineering company in Norwich in the UK.

Ruben Spyker has moved on from the Australian Submarine Corporation and has taken up a position as a naval architect in the Ship Survey and Engineering department with Transport SA in Adelaide. He is now deep into plan approval and stability assessment.

Paul Steinmann has moved on from Seastate and is now consulting to the offshore industry as Steinmann Consulting in Fremantle.

Harry Stronach continues consulting as Harry Stronach and Associates, in Akaroa, New Zealand, serving the Lyttelton/Christchurch region.

Samantha Tait, as part of the RAN's move towards using classification societies in some roles, recently spent three months in Hamburg, Germany, working with Germanischer Lloyd and evaluating their surveyor's training course for Defence applications. On her return she moved on to a new position within the Anzac Systems Program Office, working for the Project Management Office (formerly PRMGS) in Williamstown. The new position, Hull Systems Engineer, manages all structural, outfit, weight and stability aspects of building the Anzac-class frigates from the Commonwealth's perspective. The position also covers events such as launchings, inclining experiments and dockings.

Stephen Watt, a graduand of the Australian Maritime College, has taken up a position as a naval architect with Austal Ships in Fremantle.

Martin Williams has moved on from his position as Design Manager for the Minehunter project in Newcastle, and has taken up the position of Chief Naval Architect for ADI (Major Programs), sharing his time between Newcastle and Garden Island.

Dominic Worthington completed his exams at the Australian Maritime College in January and, in addition to being a naval architect, is now a fully-qualified watchkeeping engineer with

both a motor ticket and a steam endorsment. He can therefore sail on both motor and steam ships as a watchkeeper. He sailed on *Devil Cat* for all of February, and is due to transfer to *Bass Trader* on 1 March.

Shaun Yong has moved on from Ron Manufacture in Singapore and has taken up a position with the Yantai Raffles shipyard in Singapore, where he is responsible for marketing.

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.

Phil Helmore

MEMBERSHIP NOTES

AD Council Meetings

The Australian Division Council met on 12 December, with teleconference links to all members and John Jeremy in the chair in Sydney. Matters, other than routine, which were discussed included:

- Forward planning: Report on recruitment of members prepared by WA; to be discussed at next meeting.
- Misuse of the term 'naval architect': Following concern at a magazine article referring to naval architects, the President had written to the editor, setting out the position of naval architects and the role of the Institution.
- Budget for 2002: The budget for 2002 shows a surplus of about $3000 which, if achieved, will be the second year in a row following a long string of deficits. This is due, in part, to the higher proportion of funding being returned to the Division from Head Office.
- *The Australian Naval Architect*: Increasing the format of the journal from A5 to A4 would allow a slightly larger font size and the inclusion of longer technical articles, but may increase costs slightly, depending on content. A4 format was agreed.
- RINA/IEAust Joint Board matters: No joint board meeting has been held. Regarding a Naval Architecture category on the National Professional Engineer's Register (NPER), a competency panel has now been formed, guidelines have been established and are out for comment. The issue of fees for joint membership is still under discussion by IEAust.
- Courses, Awards and Prizes: Brian Hutchison has completed his compilation of courses, awards and prizes in ship and boat design and building around Australia, and this document was approved for distribution and appearance on the website.
- Videotape library: Division will explore the possibility of videos of RINA conferences held in London being made available.
- Proposed Pan-Asia Association of Maritime Engineering Societies: The proposal is for a loose association of the various technical societies in the south-east Asian region, by invitation. The primary purpose is the organisation of occasional conferences, symposia, etc., say every two or three years, focusing on the interchange of ideas. Initially the emphasis would be on the academic side due to a common reluctance among Japanese shipbuilders to get too closely involved in such activities. The proposal was supported in principle by Council, paving the way for informal cooperation, but any formal link would need to be signed by head office (this also applies to the Hong Kong and Malaysian joint branches).
- WA mini-conference: The WA Section advised that, as in previous years, it will hold its own mini-conference in association with Ausmarine West in Fremantle on 29–30 October 2002.

The next AD Council meeting is scheduled for Wednesday 27 March.

Phil Helmore

Where Does The Money Go?

I heard recently that there is a perception in some areas "that Sydney (sic) siphons off the money coming back to Australia from London for no apparent return".

I was disappointed to hear this. In the past there *were* reasonable concerns that the Division was somewhat "Sydney-based" and the Division Council has worked hard over the last few years to correct this. I believe that it has succeeded. The Division Council, as now constituted, genuinely represents the Australia-wide membership and tele-conferencing for Council meetings means that the views of all sections are taken into account.

I thought that a summary of the expenses budget for 2002 would be helpful in addressing these mis-conceptions. If we exclude *The ANA*, which is self-funding thanks to a generous corporate sponsor, and provisions for contingencies, then the Division's expenses budget for 2002 looks like this:

Yellow Pages Listing	$450	2%
Insurance — Pub Liability	$900	5%
Secretary Honorarium	$6,000	30%
Payments to Sections	$7,000	35%
Postage	$830	4%
Prizes	$850	4%
Council Meetings	$1,600	8%
Phone/fax costs	$1,000	5%
Other — Office Equipt, Stationery, PO Box, Email	$1,330	7%
Total	$19,960	100%

Of this total, only $1,600 will be spent on Sydney-based activities, i.e. the NSW Section. All other expenditure will be incurred serving the Australia-wide membership. I don't think this is "Sydney siphoning off the money …… for no apparent return."

Of course you may feel that the Division operates inefficiently and that it could do more for its members for less expenditure. That's great! Your section's member of Council will be delighted to hear from you. If you can't find him or her then contact me directly by phone on (03) 9857 9011 or e-mail navarch@ozemail.com.au. If there are ways that things can be done better then we want to know about them.

Bryan Chapman

The Walter Atkinson Award for 2001

The Award

Walter Atkinson was one of Australia's great naval architects, a founding member of the Australian Branch (as it was then) of the Royal Institution of Naval Architects, and a long-serving member of council. 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 to the Institution. The Award is now valued at around $250, and is assessed, on behalf of the Division, by the Sections and a sub-committee of Council.

Current guidelines for the Award are:

- All members of the RINA Australian Division are eligible, with the exception of members of the Division Council.
- The paper must be presented at a RINA meeting or maritime conference or published in a journal within Australia during the current year.
- The paper must be a technical paper, not simply a lecture, and it must be more than just a promotional presentation.

The Sub-committee will consider such selection criteria as:

- 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?

The current terms of the award include not only RINA meetings, but any Australian maritime conference or journal. This means that papers presented at any marine conference in Australia in 2001 (Ausmarine East, for example), and papers published in *The ANA* are also eligible for the award for 2001.

Call for Nominations

Nominations for the Walter Atkinson Award for papers presented in 2001 are therefore requested.

To spread the assessment task, nominations are made through the Sections. If you wish to nominate a paper for the award, your nomination should be in writing (which includes email or fax) and should be received by the Secretary of your local Section (or, for NT or SA residents, the Division Secretary) by 15 April 2002.

Sections then consider the papers nominated to them and each make one recommendation to the Australian Division by 31 May. The Division will then consider the recommendations from the Sections and decide the award by 30 July, and the award will be announced in the August issue of *The ANA*.

So, think which was your favourite paper you saw presented or read in 2001 and don't delay, nominate today!

Phil Helmore

Hang on! This fine photograph of USS *John C Stennis* (CVN 74) heeling in a turn last April shows that even 102 000 t aircraft carriers can behave like ships when the occasion demands
(US Navy Photo)

FROM THE ARCHIVES

At first glance the photograph on the right seems inconsequential, but it does illustrate a bit of history brought to local attention in recent months. It shows a view of the harbour during the start of the 1964 Sydney to Hobart race. The sloop in the foreground is the Alan Payne designed *Cherana*, but in the background, taking part in her last Sydney to Hobart is the schooner *Astor*. There were 38 entries in the 1964 Sydney to Hobart, which was won by *Freya*.

Astor was built (as *Ada*) by William Fife in Scotland in 1923 for Sir Alexander McCormick who kept her moored off Point Piper. She was sold in 1942 and again in 1959 to Peter Warner who renamed her *Astor*. She went on to win line honours in the Sydney Hobart three times, including the 1964 race. Sold at the end of that year to American owners, *Astor* left Australia for the northern hemisphere.

Astor changed hands again in 1987 and her present owners, now retired, spend some time each year sailing the Pacific. They arrived in Coffs harbour in November 2000 and visited Hobart for the Wooden Boat Festival, where *Astor* won an award as Best Presented Yacht. She visited Sydney in May 2001 with visits to New Caledonia and Vanuatu planned. At the end of December *Astor* was in Sydney again and took part in a rally for Fife designed and built yachts at the Sydney Amateur Sailing Club. In the photograph below, she is about to round the Beashel Buoy near the Sow and Pigs Reef in Sydney harbour on a day hazy with bushfire smoke.

The other yacht in the picture is *Sayonara*, which also features on the front cover. Built in 1897, *Sayonara* is a Melbourne yacht that has been visiting Sydney for the summer. The beautiful yacht was magnificently restored a few years ago by her present owners.