New Zealand Naval Architect

The New Zealand Division of the Royal Institution of Naval Architects

Issue 39 November 2012

Rina Awards Recognise the Excellence of the Research Carried Out by the Yacht Research Unit

In 2011, Professor Richard Flay (Council member and Vice-President, Rina (NZ), and Director of the Yacht Research Unit) was awarded the Institution's Medal of Exceptional Merit, for the paper entitled: "Force and pressure investigation of modern asymmetric spinnakers", authored by Dr Ignazio Maria Viola and Professor Richard G.J. Flay, published in the 2010 RINA Transactions.

Professor Flay receiving the Medal of Exceptional Merit from the Chief Executive, Trevor Blakeley, at RINA HQ, Belgravia, London, UK, in July 2011

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Inside This Issue

President's Message

Ian MacLeod

I must admit that for a Naval Architect I am not much of a yachtie but I was absolutely awestruck by the recent footage of ETNZ's AC72 Catamaran streaking along 3 feet above the Hauraki Gulf.

While such a sight must be interesting for the general public, it is so much more impressive for anyone with a knowledge of aerodynamics, hydrodynamics and structural engineering in the marine environment and we really are bordering on rocket science. Testament to the rocket science analogy and the speeds and forces involved is the fact that the crew now wear helmets and carry emergency breathing bottles as part of their normal sailing gear!

These craft really are at the cutting edge of marine technology and provide a wonderfully visual and exciting advertisement for our industry, they are a magnificent showcase for the technical skills and expertise of our Naval Architecture peers and hopefully excite the next generation of youngsters to consider Naval Architecture as a career.

The future of our industry and our profession relies upon the continued education and

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RINA Awards . . . *continued*

In 2012, Professor Richard Flay was awarded the Institution's Medal of Distinction, for the paper entitled: "Upwind sail aerodynamics: a pressure distribution database for the validation of numerical codes", authored by Dr Ignazio Maria Viola, Julien Pilate and Professor Richard G.J. Flay, published in the 2011 RINA Transactions.

Professor Flay receiving the Medal of Distinction from the RINA President Mr Peter French at the 2012 RINA Annual Dinner, Lancaster Hotel, London, UK, on 17 April 2012.

New Editor

Mike Kay is the new editor of the New Zealand Naval Architect.

Assuming the mantle of editor, previously held for many years by Helen Clarkson, is another milestone, although unplanned, in a long career path which started many years ago in the UK. Mike is convinced that the elevation to this editorship was due to the President at the AGM mistaking a simple ear-scratching for a genuine hand-in-air "I volunteer"!

However…….

After gaining academic, heavy

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President's Message *continued*

training of high quality graduates. The recent announcement of a collaborative agreement between Auckland University of Technology (AUT) and the Australian Maritime College (AMC) provides a further option for the next generation of Naval Architects and Marine Engineers when selecting their study path. RINA HQ have confirmed that the new combined course will be accredited as meeting the education standards for membership and registration. The committee will work alongside the team at AUT to provide any assistance and guidance required to ensure the success of the course and alignment with industry needs.

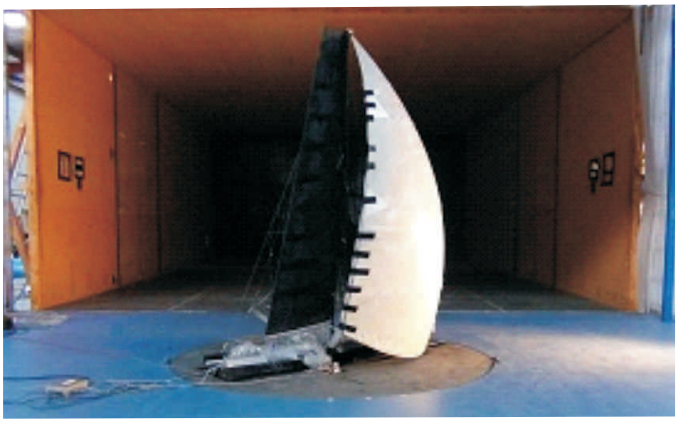
As this edition goes to print members of the committee will be judging the final year project presentations at the University of Auckland School of Engineering to select the RINA / Babcock (NZ) Ltd prize for the best marine related project and we are looking forward to project presentations from this year's Unitec Bachelor of Applied Technology students.

Since our last newsletter the committee have been involved in organising a number of interesting and informative talks, presentations and visits for our members, it is always difficult to come up with fresh ideas for these talks and meetings and we tend to rely heavily on a core of individuals on a regular basis. If you have something going on in your business or sector that you would like to share with the members or host a visit we would be very keen to hear from you, this is your opportunity to show off your wares to an assembled audience of interested colleagues.

As the RINA representative to NZ Marine I sit on the Executive Board and provide a voice to the association for our members and ensure that our role in the New Zealand Marine industry is considered in the operations of the association, providing input on discussions around training, quality, future developments and marketing opportunities such as international publications and boat shows. The 2012 Auckland On Water Boat Show is now behind us and the initial feedback received has been very positive, well done to Michelle Khan and the team from NZ Marine on bringing it all together. If you were exhibiting at the show hopefully there were some leads generated for your business that you can turn in to orders.

News From The Yacht Research Unit

Recently at the Yacht Research Unit we have been very busy with a number of projects. One of these was done by an intern student from France. Jean-Sebastien (JS) constructed a solid pressure tapped gennaker.



This involved creating a mold of the sail shape from CNC cut polystyrene, before laying up the composite sail. The core of the sail is core-flute, (or real-estate sign). The outer skins are E-glass. This allows us to drill into the core and record the pressure in a very clean manner with no external tubing or pressure taps. Once constructed, this sail was tested in the wind tunnel in a number of conditions. The sail during testing, and a typical plot of some results is shown here:

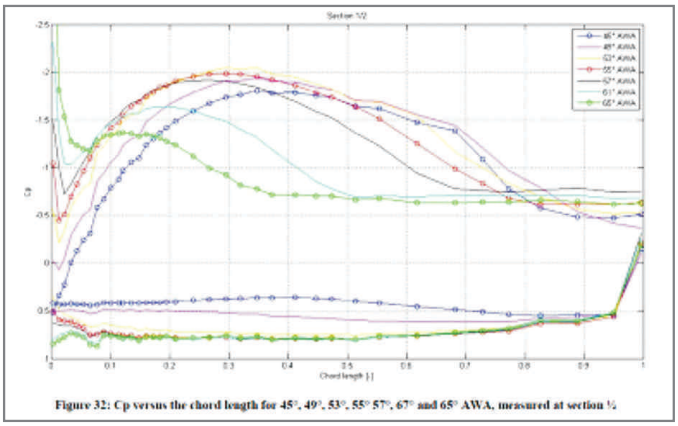
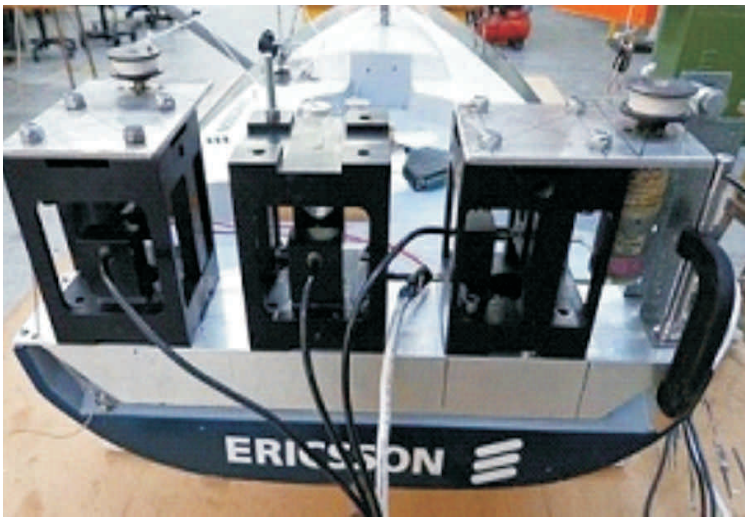


Figure 32: Cp versus the chord length for 45°, 49°, 53°, 55° 57°, 67° and 65° AWA, measured at section ½

Another recent project has been to study the different corner loads on a set of sails. This was done by Pieter from Delft in the Netherlands. Three force-blocks were attached to each of the attachment points for a range of downwind sails. These were tested across a range of wind and heel angles. The data was then used to create a prediction program where the inputs are Sail Area, Wind Speed, and type of sail. The maximum predicted loads on each corner are then given as well as how these change with apparent wind angle. Photos of the testing set-up are shown below:



Other recent projects at the YRU include:

- Full scale pressure measurement on our YRU test vessel.
- 2D AC45 Wing Section pressure measurement in the TFWT
- Parachute drag measurement for a sugar rocket
- Wind Turbine testing
- Speed Skater drag testing

To sign up to our mailing list to hear more about the YRU and our activities please email yru@auckland.ac.nz

Industry News

Marine Industrial Design (MID) has been busy across a wide range of jobs and several projects have recently completed. These include a "unique" drydock design and the conversion of an ex Naval patrol vessel to a private yacht.

"It works!" – The email received by MID from their client in San Fransico confirming the installation and completion of the project to save an 1870's paddle steamer. The idea of a new drydock type hull came about as the client wished to preserve the hull of the steamer, now being used in its retirement as a house boat. The original hull was completely wasted and not repairable, replacement with a new hull would have been prohibitively expensive and not required as the vessel no longer goes to sea.

Paddle Steamer Vallejo sitting in its new dry dock home

Paddle SteamerVallejo sitting in its new dry dock home

MID developed, in conjunction with the client, the unique solution of an outer dry-dock, shaped to fit the existing hull and in which the existing hull would be supported. There were no plans or drawings of the paddle steamer available so the vessel was 3D laser scanned, inside and out, by a US company and a hull model developed by MID in New Zealand. From there structural scantlings were developed, drawings produced and cut parts sent to the clients shipyard in China. The dry-dock had a bolt on aft section, necessary for installation purposes. Recently the on-site installation took place and it was reported that the paddle steamer fitted perfectly into its new dry dock.

HMNZS Kahu Conversion

MID were asked to assist in the conversion of the ex RNZN patrol vessel "Kahu" for use as a private yacht to be suitable for adventure exploration. The steel hull was lengthened to 32m overall with the addition of a new 8m long midbody section. MID developed the general arrangement, hull lines, produced steelwork drawings and cut parts for construction. The original aluminium superstructure was removed and a full length aluminium superstructure designed and drawn by MID.

Kahu prior to conversion

The owner wanted to preserve elements of the original character and look of the vessel, the new superstructure lines were developed with this in mind. Structural drawings and cut parts were produced for construction, all to Lloyds SCC rules. MID worked with the ship yard – Fitzroy yachts – during the conversion culminating in the launching, inclining experiment and stability calculations. The Owner is very pleased with the outcome and the boat has now departed on its voyage, starting in the Pacific and possibly going through the North West Passage.

Kahu post conversion

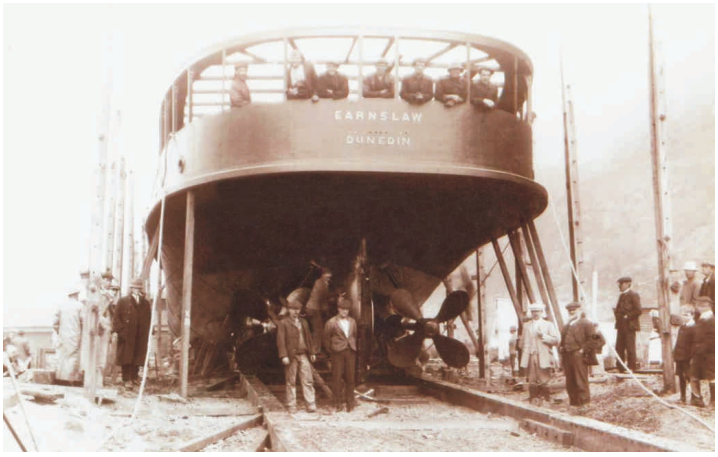
Other companies and individuals are invited to submit interesting articles or snippets too! *Ed.*

TSS Earnslaw

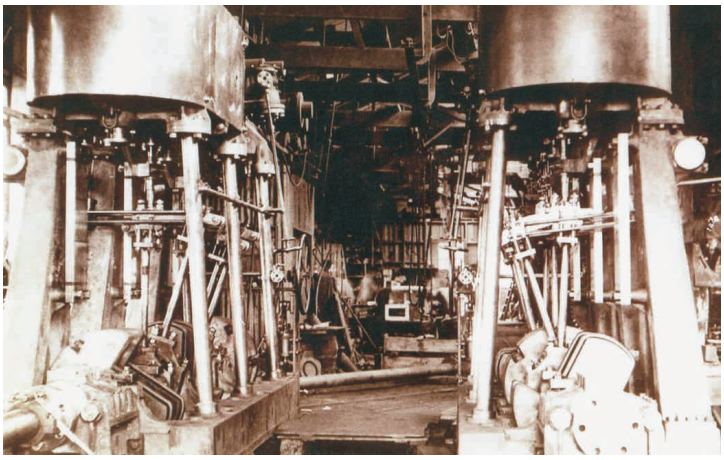
The Grand old lady of Queenstown is back in service. She made her maiden voyage in 1912 and this wonderful steamer re-enacted the voyage on the 18th of October 2012 when she turned 100.

18 October 2012 is the centenary of the maiden voyage of the steamer Earnslaw which was designed and constructed specifically to meet the needs of settlers, run-holders, prospectors and miners in the country surrounding Lake Wakatipu in the South Island of New Zealand. The lake and more particularly, Queenstown, the main centre of population on the lake, are well known internationally as tourist attractions.

The lake is located in a mountainous region and for the early pioneers there was very limited access into the region and particularly around the lake shore. From as early as 1863, the transport and supply needs of settlers and others were provided by small steam powered (and sail assisted) boats.To cope with increasing demand and to counter the short-comings of an aging fleet, in 1910 the Government commissioned the design and construction of a new, larger, ship to be named EARNSLAW after the 2820m high mountain at the head of Lake Wakatipu.

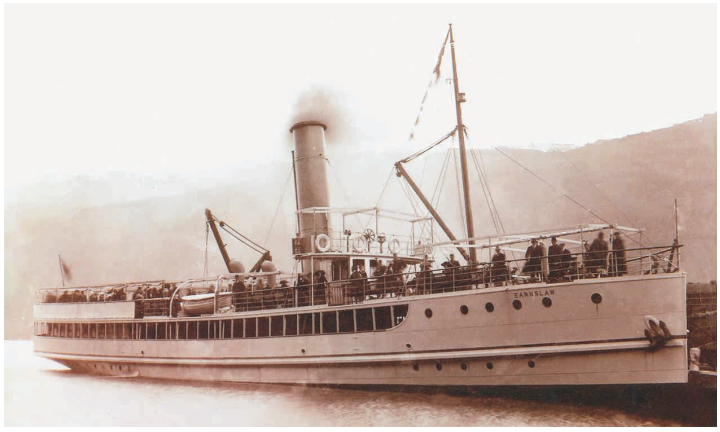


Ready for launching, Kingston, February 1912



Engines at builder's yard Dunedin

The general specification for the ship was for servicing the sheep and cattle stations, prospecting and mining operations and a developing tourist industry. The overall length of the vessel was 51.2m and the breadth was 7.32m. Depth was 2.09m and draft was 2.01m. Other specifications: Tonnage: Gross - 329.55, Net 155.43, Engines: twin triple expansion,



Berthed at Queenstown circa 1913

jet condensing producing 500 HP at 145 rpm. Bunker capacity: initially 12 tonne, later increased to 14 tonne and the coal consumption was 1 tonne per hour at cruising speed. Passenger capacity 1,035, cargo 100 tons (or 1,500 sheep, 200 bales of wool or 70 head of cattle). Crew comprised eleven. Speed was 13 knots normal and 16 knots plus on forced draught.

The interior of the first class saloon was neatly framed in Kauri and figured Red Pine. Uncut Moquette or Utrecht velvet covered the seats and the deck was covered in Linoleum with a carpet runner up the centre. A second class

On the slipway at Frankton, 1944

continued . . .

TSS Earnslaw *continued*

saloon with a bar to be located in the forecastle and a dining saloon situated aft of the engine room space and below the main deck, with access down a companionway from the first class saloon. The crew's quarters to be located below the second class saloon.

The ship was designed by Mr Hugh McRae, a Naval Architect living in Dunedin, a city on the coast 110 miles east of Queenstown. In September 1910 the contract for its construction was awarded to John McGregor and Co Ltd, also of Dunedin. The contract price was £20,850.

The keel was laid in McGregor's yard in July 1911, framing and plating were bolted as a trial assembly following which the components were dismantled and transported by rail to Kingston, a distance of more than 230 miles where temporary ways were installed. The hull and decks were assembled (approximately 80,000 rivets used) and launched in February 1912. The hull was then towed to the wharf at Kingston where engines and boilers were installed and fit-out

completed. On Friday, 18 October 1912, EARNSLAW made her maiden voyage, an event that was re-enacted at Queenstown on Thursday, 18 October 2012 to celebrate the centenary.

With the completion of highways along the entire eastern shore of Lake Wakatipu, the demand for a regular shipping service diminished. From 1952, EARNSLAW was the only steamer operating on the lake and in December 1969, New Zealand Government Railways leased the ship to tourist operators, Fiordland Travel Ltd. This company which was renamed Real Journeys Ltd in 2002, has directed

considerable resources in upgrading the ship and its operations to better meet the demands of the expanding tourist industry in the region.

The ship is now operated on a 'one class' basis with café and bar facilities. Passenger numbers have been reduced to enable a higher level of comfort. She is no longer required to carry sheep or cattle and there is little demand for freight.

continued . . .

TSS Earnslaw *continued*

During her 100 years' of continuous service, there have been only relatively minor changes; the engines and boilers are original although the maximum working pressure has been reduced. The steam driven generators have been replaced by diesel alternators. The mast, lifting gear and life-saving equipment have been upgraded to comply with current rules. The upper deck has been enclosed and an enclosed wheelhouse added to the previously open bridge.

Real Journey's CEO, Richard Lauder accepted a commemorative plague (pictured on the right) from Graeme Finch (Past President, Auckland Division RINA) to mark 100 years of service for the TSS EARNSLAW – Queenstown's "Lady of the Lake". Maurice Davis is at back.

There have been few plating repairs, these being the result of internal corrosion caused by galley drains discharging directly to the bilge. The timber decking has been replaced, the original Kauri having suffered somewhat under the impact of many thousands of clees (sheep's feet) and the hooves of cattle.

That the ship is an internationally recognised icon is indisputable and many of the readers of the Institution's publications will have experienced the enjoyment of a cruise on this old lady. Her recognition goes beyond the interest of ship enthusiasts. To quote from the New Zealand Maritime Record:

The sound of a well maintained steam engine working is music to the ears of most ship enthusiasts. When the British composer - musician Ron Goodwin took a trip on the steamer in 1978 he was so impressed by the rhythm of her twin triple expansion engines that he composed a piece of music that echoes their motion. Entitled the 'SS Earnslaw' Steam Theme', it was first performed at Invercargill by the New Zealand Symphony Orchestra.

The environment in which EARNSLAW has operated is a major factor in her longevity but due credit must be given to the builders and to the owners, New Zealand Railways and Real Journeys Ltd for their dedication to preserving this ship.

Maurice Davis, BE C.Eng, FIPENZ, Member 15 August 2012

Meet The Council Members

Ian MacLeod

Ian MacLeod is currently the General Manager of Marine Industrial Design (MID) a New Zealand based Naval Architecture and Marine design consultancy.

MID provides Naval Architecture and engineering design and consultancy services to defence and commercial clients in the marine industry. Ian also fulfils the role of Company Naval Architect for Babcock (NZ) Ltd undertaking review of all structural and mechanical design projects as well overseeing stability projects and ensuring compliance with marine classification and statutory regulations.

Born in the highlands of Scotland Ian obtained a degree in Naval Architecture and Small Craft Engineering at Strathclyde University in Glasgow before embarking on an international career with Lloyd's Register that took him around the world as a Ship Surveyor providing advice and guidance to shipyards and shipowners on the construction, repair and maintenance of all manner of commercial and naval vessels. After extended periods in Bahrain, Copenhagen, Piraeus and Dubai Ian emigrated to New Zealand in 2003

where his technical experience and practical engineering approach were welcomed by shipyards, shipbuilders and shipowners including the RNZN.

Completion of an internal senior management development program with Lloyd's Register saw a shift in career direction for Ian and seeking fresh challenges and opportunities Ian joined VT Fitzroy in February 2009 to aid the company's plan for strategic growth. Ian championed the acquisition of Marine Industrial Design which was acquired by VTF on 1st November 2009.

Since taking charge of MID as an established marine engineering design consultancy in 2009 the company has steadily increased its range of Naval Architecture services and secured a number of large Navy and Government contracts which would previously have gone to overseas consultancies. Ian is also the current President of RINA NZ and focusses his efforts on the New Zealand Marine Executive Board and within the New Zealand marine community in promoting the recognition of and value of the professional Naval Architect within our marine industry.

Ian is married with 2 young sons and lives on the Whangaparaoa peninsula where the family spends a large amount of time enjoying the beaches and the sea windsurfing, surfing, swimming and kayaking.

Cristiana Chiappini

Cristiana Chiappini is the BAT Programme Leader and Marine Technology lecturer at Unitec, Institute of Technology, Auckland, New Zealand

Cristiana completed a BEng (Hons) in Yacht & Powercraft Design at the Southampton Institute in 2001, then moved to New Zealand and graduated with an ME (Hons) specializing in Wind Engineering at the University of Auckland in 2003. She obtained a Graduate Diploma in Higher Education and has been lecturing in Marine Technology at Unitec since 2005.

While completing her Masters' thesis Cristiana worked as a Wind Tunnel assistant at the University of Auckland, followed by two years as a project assistant and marine draughts person at Vaudrey Miller Yachts. During this time she worked on a variety of projects including three high performance tenders for a 300ft Super-yacht built in Europe, a 78ft custom sailing yacht and an 85ft charter sailing catamaran.

In 2010 Cristiana was appointed to the position of Programme Leader for the Bachelor of Applied Technology. In this role, she has focused on supervising students in completing their final year project, and worked towards aligning Unitec's marine programme with industry needs.

Meet The Council Members

Rupert Shaw

Welcome to new Committee Member, Rupert Shaw, CEng MRINA

Rupert is the managing director of Lighthouse Naval Architecture which provides professional support to ship and boat designers, builders, owners and operators involved with smaller vessels up to 75m. He is a specialist structural engineer and stability analyst.

Prior to a 12 year career in the local marine design industry he was involved in boat building, production management, civil engineering and ballistic testing.

Rupert is a Maritime New Zealand recognised surveyor/naval architect and undertakes design plan approvals and statutory compliance assessments on their behalf.

New Editor continued

engineering (Tyneside and Merseyside shipyards) and sea-going experience culminating as a chief engineering officer on board British refrigerated cargo and passenger ships, Mike held senior technical management positions ashore, including a two-year contract as General Manager, Papua New Guinea Government Ships Authority.

Upon returning to New Zealand he commenced practice as a marine consultant. The practice provided opportunities for extensive wide-spectrum experience, such as appointments to the principal classification societies as non-exclusive engineer and ship surveyor, occurrence investigation and international consulting assignments, including overseas aid projects. One such year-long project was in institutional strengthening where he was the team leader engaged in the establishment of the Vanuatu Maritime Authority and Maritime Appeals Tribunal, later serving as a Tribunal member under the chairmanship of the Chief Justice of Vanuatu.

A long-held interest in improving awareness of the human element in the maritime industry, together with Auckland University's introduction of a research option for the degree of Master of Management provided the ideal opportunity to formalise this interest. Under the general heading of *Managing a Strategic Intervention,* Mike was able to research maritime safety issues with multi-national, culturally-diverse, ships' crews in a mandatory English speaking work environment; effectively a risk management operation.

He currently acts as a nautical safety inspector/ISM/ISPS auditor for the maritime administrations of Liberia, the Marshall Islands and Vanuatu, also participating in Liberia's implementation of the ILO Maritime Labour Convention 2006. The provisions of the latter will apply to most foreign-going ships and commercial yachts from 20 August 2013.

Mike has EU Professional Engineer Registration [*Eur.Ing*. (Ingénieur Européen (Fédération Européene d'Associations Nationales d'Ingénieurs, Brussels)] and is a UK Chartered Engineer. As well as being a Fellow of this Institution, he is a Fellow of the Institute of Marine Engineering, Science & Technology. He is an alumnus of Auckland University graduating MMgt, DipProfEthics and DipMgt (professional services sector).

For much of Mike's "spare" time his extramural activities include 23 years' service as a Judicial Justice of the Peace, sitting in the Auckland District Courts, and also as the Pacific Region Council Member of the London-based Commonwealth Magistrates' & Judges' Association, recently retiring from both positions, although he continues as a Ministerial JP.

He is married with two adult daughters and two, now Australian, granddaughters!

Now to some closing remarks . . .

First of all, following the initiative promulgated by our London headquarters to reduce operating costs, the *New Zealand Naval Architect* will only be available on line. It will be available to all members with email capability, as well as to those who are considered "friends of RINA".

The *New Zealand Naval Architect* is your newsletter. Frequency of issues has fallen, this being the first for 2012, seemingly through lack of interest which hopefully we can reverse. It would be good to see it return to at least four issues a year. Despite appeals from our president and secretary little input has been received from members.

MID has contributed two interesting snippets for this issue. Let's see some input from other firms and those in sole practice who have stories to tell. Forget the "tall poppy syndrome" and blow your own trumpet.

RINA is a world-renowned professional organisation. Let's give it exposure and create awareness to all and sundry here in New Zealand. The depth of maritime expertise available in this country of ours is outstanding. Let's remember, too, that the naval architectural profession includes the ideas man who can develop an idea into a design, the builder, the cabinet maker, the electrician, the end user……it is all encompassing!

Résumé

Jolan Trecherel

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September 23th 2012

Dear Sir or Madam,

My name is Jolan Trecherel, I am a french naval architect. My interest for New Zealand is present since a long time, this country is the Mecca of sailing, and the image that friends gave to me after their experiences in sailing in NZ confirms my opinion. I have a great interest to work in your country.

My different work experiences gave me skills to work in each field of yachting. So, even if I am specialized in composite materials, I can adapt me in all naval work. This versatility is a strengh for my project to work in NZ. Since I finished my studies, I decided to exercise my abilities in New Zealand. I have to idea to stay at the least one year. My objective is to find a job in naval architecture, in navigation, in boat building or in engineering. Moreover, I look for a temporary employment in a domain of yachting.

I would like to request you if you have the possibility to advise me to find a job in New Zealand. Do not hesitate to contact me if you have any further questions. I look forward to hearing from you in the near future.

Yours sincerely

Jolan Trecherel

Emails

Are you getting emails from us notifying you of events, site visits, etc?

If you are not, please ensure you update your email address. Email: jason@marinedesign.co.nz

Also check your spam box!

Please let us know if you move. Changes of address need to be sent to the head office in London. Email: membership@rina.org.uk

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