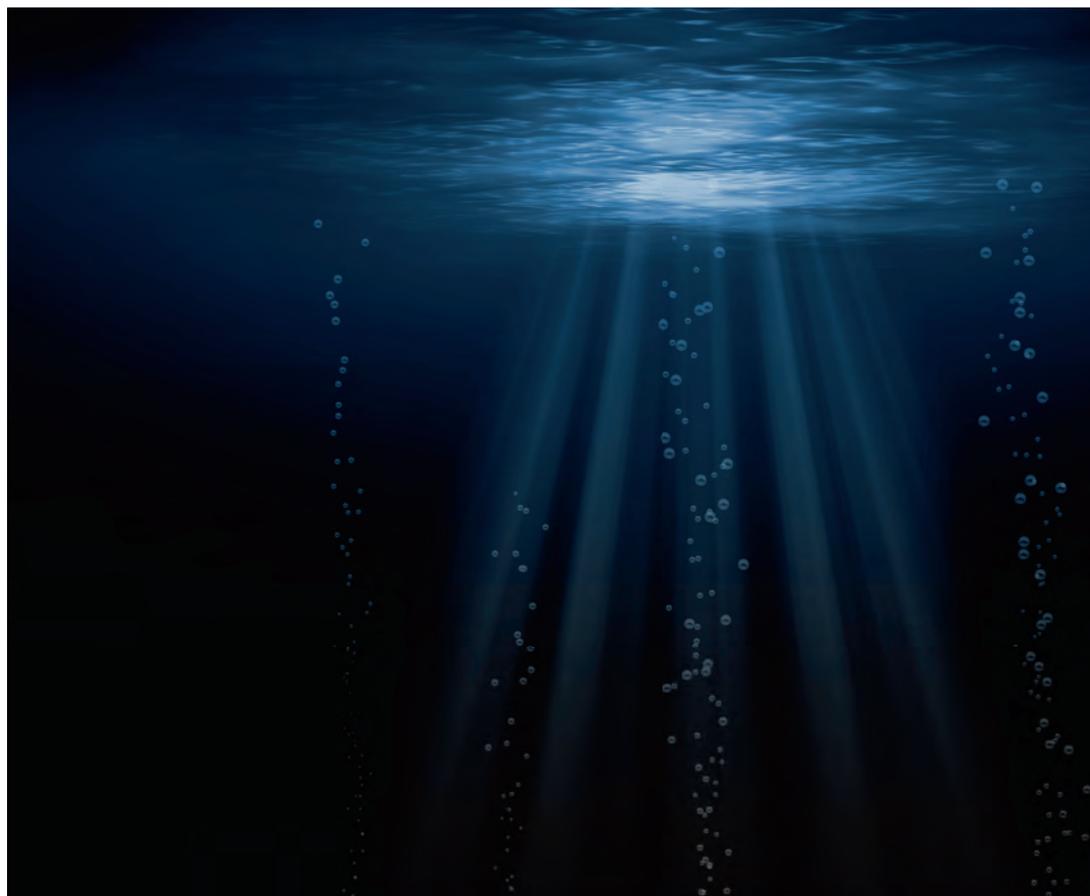




# THE NAVAL ARCHITECT

A publication of The Royal Institution of Naval Architects | [www.rina.uk/tna](http://www.rina.uk/tna)



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PROPULSION

Spanish marine industries /  
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Published by:  
 The Royal Institution of Naval Architects  
 Editorial & Advertisement Office:  
 10 Upper Belgrave Street  
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Printed in Wales by Stephens & George Magazines.

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A one-year subscription in 2009 to *The Naval Architect* costs £120 (UK), £125 (Europe), and £135 (Rest of the world).

Audited Circulation 12,017  
 JAN-DEC 2008  
 ISSN 0306 0209



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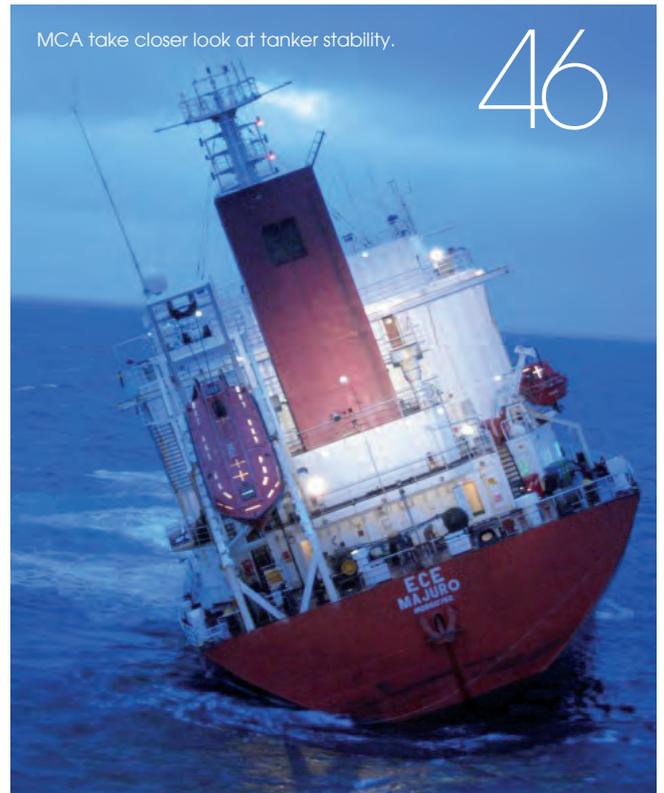
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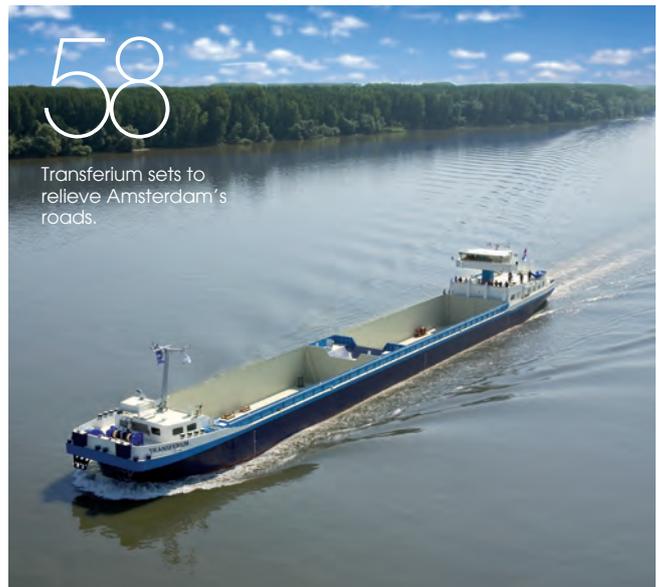
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### On-line Edition

The Royal Institution of Naval Architects is proud to announce that as of January this year, *The Naval Architect* journal has gone digital. We are very pleased to inform the maritime industry that each issue will be published online, on the RINA website. Visit [www.rina.org.uk/tna](http://www.rina.org.uk/tna) and click on the issue cover you wish to view. This means that the entire publication, including all editorials and advertisements in the printed edition, can be seen in digital format and viewed by members, subscribers, and (for a limited time) any other interested individuals worldwide.





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## Shipping has a role to play in keeping the planet safe

The shipping industry has not been standing still on this issue and progress, though slow, has been made

Saving the world was never going to be easy. Even convincing some people that the world needed to be saved has had its problems. Though with the election of Barack Obama that at least may now become less difficult.

Copenhagen may not prove to be the conference that rescues us from the blight of global warming, but it could mark a beginning of salvation. It could prove to be an historic moment for the shipping industry in particular, the day that ship operators and owners finally started to come clean.

If the International Maritime Organization (IMO) is as good as its word it is waiting in the wings for its moment, for politicians to give it the go-ahead and then it will introduce the changes necessary to save the climate. Or at least to enforce a change on the maritime industry that will substantially reduce the share of greenhouse gases (GHG) that it emits.

To be fair to the shipping industry it has not been standing still on this issue and progress, though slow, has been made. A framework, would however, with targets and stringent sanctions for those that still need convincing that it is for their own good as well as for others would add steel and speed to this process.

Even so some of what the IMO calls the "low hanging fruit", the easily realised savings, was only picked when the price of oil became so inflated in the first half of 2008 that shipowners found their costs spiralling. It was only then that owners in the container industry began slow steaming.

Crisis management? Well perhaps not quite, but there's nothing like a little economic imperative to shift the debate on.

Economic imperatives may well be what it takes to convince owners of chemical and product carriers that sailing without knowing whether their vessel meets damage stability regulations is not an option.

To the outside observer it appears that there is no debate to be had here. Surely all responsible owners make certain that their vessel, especially those that carry toxic and other dangerous substances, has the best possible chance of surviving if it is damaged before it leaves port?

On the face of it owners appear to want to be able to ignore these rules rather than

"Copenhagen may not prove to be the conference that rescues us from the blight of global warming, but it could mark a beginning of salvation"

install a comparatively cheap laptop and programme that will indicate whether the vessel complies with damage stability rules.

Maritime and Coastguard Agency (MCA) officers estimate the total cost for equipping a vessel with a damage stability computer would exceed £8000. The total

cost for the clean up of a toxic spill runs into the millions. The total cost to the marine environment cannot be measured in sterling or dollars.

Of course installing a damage stability computer will not prevent accidents from happening, but it might just mitigate the effects of such a misfortune and may deflect much of the justified criticism that would surely come the way of the maritime sector as a result. That really is worth having.

It is of course issues such as these that when the wider public becomes aware, usually through an accident which causes untold environmental damage, that is when shipping's image is firmly planted into the public's mind.

The time to deal with these situations is before they happen, not when disaster has struck and images of expiring wildlife flailing pitifully are beamed to every front room across the globe. By then it is far too late, possibly even if the floundering ship meets damage stability rules. But the censure awaiting those that fail to comply with regulations and whose vessel leaks thousands of tonnes of a toxic cocktail onto thriving coastlines hardly bares thinking about.

An owner willing to take such risks would be the type of person who would risk his last £5 pounds on the lottery rather than invest in a meal. Such an owner may as well sail his ship through a storm standing on a one legged stool with a noose around his neck and his hands tied behind his back. No doubt he would scream of all the injustices of the world when his gamble does not pay off. *NA*

## Software

## Class societies offer CSR tool

Classification societies ABS and Lloyd's Register have agreed to use common software for the assessment of scantlings of bulk carriers and oil tankers designed to comply with the new IACS Common Structural Rules (CSR's).

The new common software draws on the existing applications of both societies with the Lloyd's Register approach being used for the initial scantling evaluation (CSR Stage 1) and the ABS approach being used for the finite element assessment (CSR Stage 2).

The announcement comes after two years of detailed work by dedicated teams from both societies to identify and implement the best amalgam of the strengths of both societies' existing CSR software.

"Although shipyards, designers and shipowners have welcomed the adoption of the IACS Common Structural Rules, they have made repeated requests for a similar approach to be taken with the software needed for the application of the Rules," said ABS chairman and CEO Robert D. Somerville. "This joint initiative by two of the leading classification societies directly addresses that need."

Richard Sadler, chief executive of Lloyd's Register said: "We will welcome any approach by our colleagues from the other societies to join this endeavour to introduce a standardised approach to the application of the Common Rules for these two ship types," Somerville stressed. Such usage will merely require a simple licensing agreement.

## Shipping

## Stena's Irish Sea cruise

Stena Line has announced details of a new addition to its Northern Corridor fleet. From early November the company will introduce a third ship, the *Stena Navigator*, on its Stranraer-Belfast route. The vessel will cater for both freight and passenger traffic with a capacity of up to 1500 passengers and up to 50 lorries or 280 cars. The addition of the vessel and an onboard upgrade programme that's currently under way in Belfast Port represents a total investment on the route of over £6million.

*Stena Navigator* will be substantially upgraded and creates an opportunity to introduce a new cruise ferry concept. With dedicated facilities for freight drivers including a truckers restaurant and separate truckers lounge, substantial passenger



*Stena Navigator* brings the cruise ferry concept to the Irish Sea.

areas, expanded free wifi accessible 24 hours and free movies, the ship will offer a new travelling experience for customers.

The introduction of the *Stena Navigator* will expand Stena Line's current fleet of the *HSS Stena Voyager* and *Stena Caledonia* and provides the company with an opportunity to make a number of changes to its existing timetable which better reflects the needs of its freight customer base. Stena Line will be able to offer up to 14 crossings on the route each day, two more crossings than the present timetable allows.

Frank Nieuwenhuys, freight commercial manager for the UK and Republic of Ireland, said: "The introduction of the *Stena Navigator* will give us the opportunity to provide our customers with an increased number of timetable options specifically appealing for our important freight business."

The additional capacity on the route will also enable Stena Line to offer additional space at peak times and to meet the expected upturn in freight volumes in the next two years.

"While trading conditions remain challenging, Stena Line is confident about the future and is putting the necessary investment in place to ensure that it can better service its customers as the improvement in economic circumstances develops", he said.

## Environment

## ETS paper gets broad support

Comments from a diverse cross section of interested parties showed broad support for a paper on a CO<sub>2</sub> emissions trading system (ETS) that was published by the shipping associations from Australia, Belgium, Norway, Sweden and the UK in late September.

Most interestingly was the comment from the UK



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Shipping Minister, Paul Clark who said: "I welcome this paper and am delighted to see that the shipping industry is taking this vital issue seriously". He went on to say that the ministry was: "Investigating the possibility of the UK submitting a paper on emissions trading to the International Maritime Organization (IMO), based on this industry paper. We hope to be in a position to submit this for consideration at the next meeting of the IMO's Marine Environment Protection Committee in March."

When the paper was launched one of the co-sponsors the UK Chamber of Shipping president, Jesper Kjaedergaard, said: "Shipping is, by a considerable margin, the most efficient way to transport goods, but it still produces about 3% of the CO<sub>2</sub> emitted as a result of human activity. Clearly such a major industry, transporting over 80% of world trade, has a responsibility to reduce carbon outputs. We believe some form of emissions trading system is the way to do it."

Support for the paper was also shown by CBI Director for Business Environment, Dr Neil Bentley, said: "This is a constructive report... The CBI supports the inclusion of international shipping in an emissions trading scheme because it will be crucial for both maintaining a level playing field between competitive shipping markets, and for establishing a global price for carbon".

Peter Lockley, head of transport at WWF-UK believes that the paper's proposals could put the maritime industry ahead of other sectors in the race to be seen as green: "WWF particularly welcomes the industry's proposal that 100% of their emissions permits should be auctioned – which would put shipping streets ahead of the aviation industry in the race to be seen as a green sector."

Mr Lockley went on to say: "It's vital that shipping is addressed in the upcoming Copenhagen climate agreement and this paper presents a detailed proposal about how this could be done."

#### Environment

## Shipping ETS: Key Points

- Some form of economic instrument or MBI is both necessary and desirable
- Clear preference for global, open trading scheme under the purview of the IMO
- Need to respect IMO principle of 'No More Favourable Treatment' as well as address developing-country aspirations under 'Common But Differentiated Responsibility'
- Applicable to all flags and to all vessels, above a tonnage level to be decided

- Individual ship emissions derived from fuel consumed as recorded on bunker delivery notes
- Must be straightforward to understand and implement at the level of the shipping company
- Different options under consideration as to how credits are allocated/auctioned and how reporting and verification should work
- Two proposals for the distribution of allowances – in both options, any shortfall between shipping consumption and available units can made up by other credits from land-based systems (JI, CDM, etc)
- Sectoral Approach (Generates a central fund)

1. UNFCCC allocates AAUs to the IMO – equivalent to the cap, thus effectively treating shipping as a 'country'.
2. IMO auctions credits to shipping companies who surrender these back to the IMO to match bunker consumption.

- 'Distributed Auction' Approach (Funds flow through government treasuries).

1. UNFCCC allocates additional 'shipping AAUs' according to bunker sales to countries selling bunkers. These are sold by governments at auction to shipping companies.
2. These are converted – for compliance purposes only – into 'Shipping Emission Units' (SEUs), using an IMO-managed central register.
3. The cap is set by limiting availability of these shipping credits (SEUs).

- Monitoring and verification through central IMO body.
- Compliance through flag and port state oversight.

In either case, the compliance period is yet to be decided. May be 'pay-as-you-go', always in credit, or a fixed period, 3, 6, 12 months.

#### Competition law

## EC formally closes class investigation

The European Commission (EC) announced on 14 October that it has brought its investigation into alleged competition infringements by the International Association of Classification Societies (IACS) to an end without finding any infringement of European Union (EU) competition law.

Dr Hermann Klein, the Chairman of IACS said the decision leaves: "The reputation of classification



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LIFE MATTERS

societies as independent third party organisations respecting law and order reinforced.”

As a result of and during the course of the investigation IACS agreed to develop qualitative membership criteria and the institution of an independent appeal board. Additionally IACS will offer non-IACS societies the opportunity to participate in its technical work.

#### Shipbuilding

## HHI delivers new product tanker

The 112,000dwt tanker *NS Africa*, the vessel is the fourth in a series of four similar aframax ships, was delivered to owners Novoship, part of the Sovcomflot Group, last month.

The *NS Africa* was built with fully coated cargo tanks that will allow it to carry up to four different grades of cargo simultaneously including clean petroleum products.

#### Specifications:

- Length on Average 250.0 m
- Breadth Moulded 44.0 m
- Depth 21 m
- Draft 14.7 m
- Service Speed (open water) 15.0knots
- Main Engine Maximum Continuous Rating 19 430 bhp (14 280 kW) at 105rpm

The first two ice-class vessels *NS Arctic* and *NS Antarctic* were delivered in the second quarter 2009 while *NS Asia* was delivered on 21 July.

The design and the operational characteristics of the vessels are in compliance with the ultimate requirements of Oil Majors as well as the requirements set by international and national conventions related to the safety of navigation and the protection of marine environment. DNV has issued the Clean Notation for the *NS Africa*.

#### Finance

## FLEX LNG IPO on Oslo bourse

Flex LNG held late in October an initial public offering in a bid to raise US\$10million in working capital for the company.

The company issued 102,364,371 shares with a nominal value of US\$0.01 with the initial price range set to between NOK4.5 to NOK8 per share. Shares will trade on the Oslo Axess exchange. Trading in the shares was expected to start on or around the 30 October.

#### Acquisitions

## Hamworthy acquires Krystallon

Krystallon Limited, the company which supplies on board sulphur emissions scrubbers, has been bought by Hamworthy, forming a new company, Hamworthy Krystallon.

Krystallon was a leader in the in the gas scrubber field and it was trials of its plant and material that was material to the International Maritime Organization's (IMO) decision to approve gas scrubbers as an alternative to low sulphur fuel, as required MARPOL Annex VI regulations on emissions.

The renamed Hamworthy Krystallon will be part of the Inert Gas Systems division.

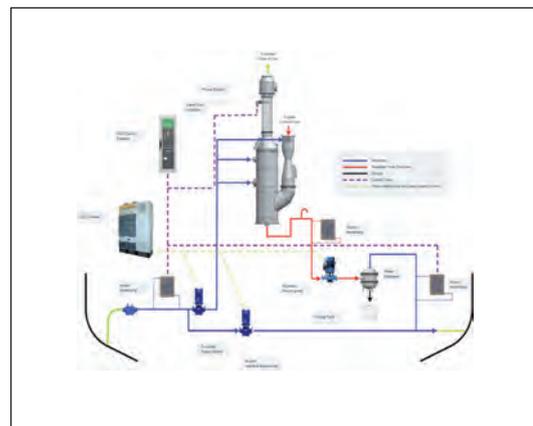
Last year IMO agreed the concept of Emission Control Areas, ruling that the maximum sulphur content in fuels used in such zones must be cut to 1.5%, then to 1% by 2012, and to 0.1% in 2015.

The regulations are already in force in the North Sea, English Channel and the Baltic. Similarly the USA and Canada have applied for emission control area status for the waters extending 200 nautical miles from their coasts. Other countries are expected to follow suit. A global limit of 0.5% Sulphur content in the fuel has been proposed from 2020.

Hamworthy Krystallon's scrubber system is an open loop design that neutralises scrubbed acid gasses using the carbonate/bicarbonate naturally occurring in sea water. Fitted into the ship's funnel space, the unit can be operated at temperatures of up to 450°C.

The units so far delivered have worked in combination with diesel engines in the 1MW – 8MW power range, but Krystallon has developed designs to work with engines of up to 67MW.

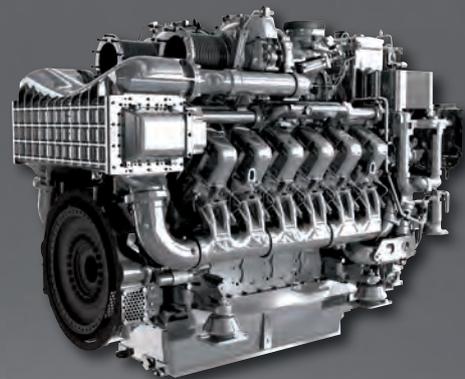
System diagram of Hamworthy Krystallon's Sea Water Scrubber and Wash Water Treatment System.



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Ancillary equipment

## Steel Climber is ready to go

The SteelClimber Mk 2 is a hydraulically steered and driven lift and adheres magnetically to steel structures with considerable force. A patented use of permanent magnets through two flexible belts enables the SteelClimber to operate above or below water and to travel at up to 30m per minute at any altitude. This makes it an ideal vehicle for a wide range of tasks such as hull cleaning and thickness measurement. Its developers; Miko Marine AS and Bratberg Producter AS are now inviting approaches from organisations with payloads that the SteelClimber can deploy for them.

It is capable of carrying a payload of up to 200kg and the SteelClimber can be deployed by a crane and submerged before it can function. The unit can simply be attached to the freeboard of a hull, inspected to check that its payload is fully functional and then driven down the side of the ship and into the water. The design of the belt drive enables it to negotiate curved surfaces, to pass over marine growth with ease and to access all of a ship's submerged surfaces.

Powerful magnetic rollers behind the belts each have an adhesion force of 40Kg each. Normally nine magnetic rollers are used and even through the heavy duty 2mm thick belt an adhesive holding force of up to 360kg can be measured. This gives the device its exceptional load carrying capability and ensures that it is unaffected by currents or vessel movement.

When it is being deployed out of water the SteelClimber offers a practical means of undertaking cleaning, inspection or maintenance tasks in otherwise inaccessible tanks, holds or superstructure. The simplicity and reliability of the hydraulic drive and steering system is also seen as a major benefit that will enable high value payloads to be deployed with confidence.

**Contact** Miko Marine AS, Ruseløkkveien 26, PO Box 1534 -Vika, N - 0117 Oslo, Norway.

**Tel** + 47 46 90 50 00

**Fax** + 47 22 83 65 15

**E-mail** info@miko.no

**www**.miko.no

Ancillary equipment

## Eniram DTA Roll-Out on NCL

Eniram Ltd. has announced the extension of the existing fleet-wide agreement with Norwegian Cruise Line (NCL) to provide its Dynamic Trimming Assistant (DTA) to include newbuild NCL cruise vessels.

The system will now be deployed on the *Norwegian Epic* and the plan is to deploy the Eniram DTA to all future NCL cruise vessels.

Following the first installation on *Norwegian Jewel* in October 2008, the Eniram DTA has been rolled out to all NCL cruise vessels in operation. The fleet-wide use has proved to bring significant savings on fuel consumption and a corresponding decrease on exhaust emissions. The DTA dynamically retrieves and analyses data of the prevailing trim, propulsion power and the use of stabilisers. The system combines the data with current conditions such as waves, wind and speed, and determines the optimal trim for each situation.

**Contact** Eniram Ltd, Itälähdenkatu 22a, FI-00210 Helsinki, Finland.

**Tel** +358 10 843 3800

**Fax** +358 10 843 3999

**www**.eniram.fi

Ancillary equipment

## Final approval for cleanballast

The International Maritime Organization (IMO) has granted the Final Approval of Active Substances to RWO's ballast water treatment system CleanBallast. Bremen-based RWO.

The IMO has granted the Final Approval of Active Substances to RWO's ballast water treatment system CleanBallast at the 59th session of the IMO's Marine Environment Protection Committee (MEPC59) on 17 July 2009.

This final approval is one of four major steps necessary for obtaining the full type approval certificate for ballast water treatment systems. As a first step, RWO received the basic approval of active substances from the IMO in October 2006 and subsequently finalised the land-based type approval of CleanBallast in 2007.

With the newly granted Final Approval, the ongoing shipboard type approval will be the last step required for obtaining the type approval certificate. Two of the required tests were successfully completed aboard a container vessel during recent months and the third, and last test necessary to complete the six months minimum shipboard testing period is scheduled to be carried out in late summer. RWO is hoping to be issued with the full Type Approval Certificate for its CleanBallast system by the German administration in autumn 2009.

**Contact** RWO GmbH, Marine Water Technology, Thalenhörststrasse 15 A, 28307 Bremen, Germany.

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Engines

## MAN Celebrate Order Completion

MAN Diesel SE recently held a small celebration at its factory in Augsburg, Germany to mark the start of acceptance testing of the final engine of eight ordered by shipowner Harren & Partner of Bremen, Germany. The engine is destined for one of a series of eight 16,500dwt oil products and chemicals tankers being built at the Chinese Jiangnan Shipyard.

Of the eight vessels ordered by Harren & Partner, six were delivered in the period between November 2004 and November 2006 with the final two scheduled for handover later in 2007. In detail, the tankers have a liquid cargo capacity of 19,500m<sup>3</sup>, an overall length of 144m, a beam of 23m and an 8.4m draught.

The tankers feature a single six cylinder inline version of the 48/60B heavy fuel main engine. Rated 6300kW at 500rpm, the 6L 48/60B engine transmits propulsion power to a single MAN Diesel Alpha CP propeller via a Renk reduction gear. Built to Ice Class 1A, the vessels also feature a take-home device whereby the 1500kW A van Kaick shaft generator on the reduction gear can act as a motor, drawing electrical power from the ship's auxiliary engines.

MAN Diesel notes that the eight engines were among the first examples sold of the further developed "B" version of its well-proven type 48/60 diesel, featuring enhanced fuel consumption and reduced emissions among other improvements.

Commenting on the successful contract both Peter Grönwoldt, managing director at Harren & Partner Ship Management and Wolfgang Volkens, fleet manager at Harren & Partner Ship Management stress the positive performance of MAN Diesel and its engines. "Safe and uninterrupted engine operation, long pre-planned overhauls and reliable partners help us to keep track of our operating expenses which are more and more under scrutiny these days."

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**Fax** +49-821-3223382

**E-mail** mandiesel-de@mandiesel.com

**www**.manbw.com

Ancillary equipment

## Wärtsilä supplies to Stolt Tankers

Wärtsilä and Stolt Tankers BV have signed an agreement for Wärtsilä to be the exclusive supplier of bilge water treatment units to the Stolt-Nielsen group. The agreement ensures that newbuildings, and retrofits of existing Stolt vessels, will be fitted with Wärtsilä Senitec M-series bilge water treatment units and Wärtsilä Senitec BilgeGuard bilge discharge monitoring systems.

"We believe that continuous improvement leads to lean, agile processes and excellence in general. Stolt strives to select partners who display a similar philosophy. We recognised the excellence of continuous improvement in the Senitec unit, which is clearly the market's most evolved unit," says Rob Scharff, general manager of purchasing and logistics at Stolt Tankers BV.

The Wärtsilä Senitec M-series range encompasses the M500, M1000 and M2500 bilge water treatment units, capable of treating 0.5 to 2.5m<sup>3</sup> of oily water per hour respectively. All units guarantee that the oil content in the treated water will be no more than 15 ppm (parts per million), with real case levels being below 1 ppm during continuous operation. Together with the Wärtsilä's Solidpac add-on, the units will reduce the amount of bilge water for disposal ashore by as much as 95%, minimising the environmental impact and significantly lowering disposal costs.

**Contact** Wärtsilä Corporation, John Stenbergin

Senitec M-series.





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#### Ancillary equipment

## WME awarded HVAC contract

Wilhelmsen Marine Engineering has been awarded the contract to deliver a heating, ventilation and air conditioning (HVAC) system for a new RoPax vessel being built at Brodosplit Shipyard in Split, Croatia for Compagnie Meridionale de Navigation (CMN).

Under the terms of the deal, WME will deliver everything from system design to material and commissioning of the system. Jan Wallberg, area sales manager Europe for Wilhelmsen Callenberg Flakt says that key factors in this project were energy efficiency and the environment. WME's capability to deliver an energy efficient solution was probably the crucial point in winning this business, he adds.

**Contact** Wilh. Wilhelmsen ASA, Strandveien 20, NO-1366 Lysaker, P.O.Box 33,

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**Tel** +47 67 58 40 00

**Fax** +47 67 58 40 80

**E-mail** ww@wilhelmsen.com

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#### Software

## Bricsys launches latest version

Bricsys nv has launched Version 10 of Bricscad, the DWG-alternative CAD platform. Bricscad V10 has a host of new features, foremost of which is eBridge.

eBridge links Bricscad to Vondle, Bricsys' "Cloud Based" Project Collaboration suite, which will offer customers a more efficient way to view and share files online.

Vondle supports up to 40 different file formats, including DWG, AutoCAD, MS Word, MS Project and PDF. There will be no need to download the documents or have a local copy of the application and will allow large multi-megabyte files to be shared in seconds, via a web browser.

Erik De Keyser, CEO of Bricsys said: "Bricscad V10 is the perfect platform for teams. eBridge is just the start of integrating new team-collaboration

tools into CAD".

Besides eBridge, Bricscad V10 will offer a whole range of performance improvements including; Smooth and fast view panning, smart selection highlighting, cycling through elements during selection, snap tracking with parallel alignment to Z-axis, gradient hatching, PDF export using plot style tables, amongst others.

"Our success to date has been based on offering DWG compatibility, a recognisable interface, real day-today-support and reasonable prices. With Bricscad V10 we hope to demonstrate that Bricsys is not just a slavish follower of DWG CAD but is one of the most innovative companies in its field," says Eric De Keyser.

Future developments of Bricsys will see the release of a plug-in for AutoCAD and a free 144 page e-book "Bricscad for AutoCAD Users" is available online.

**Contact** Bricsys nv, Bellevue 5/201,

9050 Gent, Belgium.

**Tel** + 32 9 244 01 90

**Fax** + 32 9 244 01 99

**www.bricsys.com**

#### Propulsion

## Berg wins large Asian order

Berg Propulsion has secured the first Asian reference for its Berg Azimuth Thruster (BAT), launched earlier this year, in what is also the first order to involve the product's installation by a Chinese yard.

Berg has signed a contract with Singaporean oil and gas field support and logistics contractor Teras Offshore to deliver its largest BAT units to date, in the shape of two 2500kW (1600 rpm) output BAT 730 units, as well as two BTT 519 tunnel thrusters.

Berg Propulsion Singapore Production Facilities will deliver all units in August 2010 to CCCC Bomesc Marine Industry Co., Ltd. (Tianjin, China), for installation onboard a 13,000dwt deck cargo vessel, to work in combination with electric motors. The vessel will be 158.0m long, 28.2m wide and 9.0m deep vessel (draught 5.6m), classed by ABS

"Having already secured orders covering a survey vessel rebuilt in Sweden, and a smaller offshore vessel to be built in Dubai, we have now moved on to the larger end of the BAT capacity scale with this order for Teras," said Berg Propulsion Sales Director, Asia, Aloysius Hendricks.

Mr Hendricks said the BAT 730 unit worked with propellers of up to 3m in diameter. The BAT was now available in power ranges of up to 3200kW,

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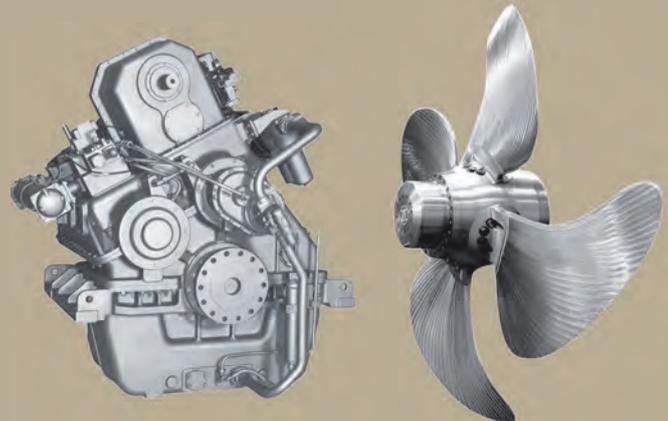
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The newly launched Berg Azimuth Thruster from Berg Propulsion is now available with power output of up to 3,200 Kw.

The Scanjet water cannon defence system is a system that is designed to protect the crew, vessel and cargo, making boarding at sea virtually impossible, and to prevent gun fire onboard.

We have used our water jet technology to develop a product that we expect will meet our customer's demands for protection. The production of all our machines including this one is located at our factory in Sweden, where we also have our R&D says Magnus Wallin, President of Scanjet Marine AB.

By strategically placing the water cannons around the vessel, 100% coverage will be obtained, boarding becomes very difficult. The system can often be powered by existing pumps so no extra equipment may need to be purchased.

The system can be remotely and safely operated from any look out post around the vessel. The system will also work continuously in dark and night-time conditions.

**Contact** Scanjet, Södra Långbergsgatan 36, P.O. Box 9316, 400 97 Göteborg, Sweden.

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he said.

The BAT can be delivered in both CP and FP propeller versions and is available in L-Drive and Z-Drive versions. It is suitable for either electric motor or diesel engine drives and works with either an electric or a hydraulic turning mechanism.

**Contact** Berg Propulsion AB, Långsand 1, Box 1005, SE – 475 22 Öckero, Gothenburg, Sweden.

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Ancillary equipment

## Scanjet's Marine Protection System

Scanjet Marine AB, has announced its latest product in tackling piracy the anti-pirate water cannon. The Swedish company has developed a Marine Protection System based on existing tank cleaning technology.

The patented anti-pirate water cannon system is powered by an integrated turbine, driven by the water flow. The system will remain running until the vessel is safe and the pumps are switched off.

Scanjets has launched its latest product that will aid anti-piracy.



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# Educating ANNs means the weighting is over

George Sachinoglou, a post graduate student at the School of Marine Science & Technology of Newcastle University, uses artificial neural networks (ANNs) to estimate the lightship mass of container carriers.

**P**redicting the lightship weight of a vessel is vital during the design process as it specifies the required deadweight that can be carried, so that the displacement is a balanced sum of the payload and the lightship, [1]. Improving the accuracy and efficiency of predicting the lightship weight has a significant impact on structural design as well, [2].

The context of this study involves using ANNs as a different approach to learn the relationship between principle features of containerships and their lightship weight as a means to provide a useful design tool with respect to lightship weight estimation at the preliminary design stage seeking more accurate results once more information is available.

In order to apply the above mentioned, a massive network interconnecting input variables, being the parameters affecting the overall quantity of lightship weight, and output variable, being the known lightship weight, was constructed. This network has the ability to be adaptive, in terms of creating and editing the strength on its own connections (synapses), which in the end appear in the form of coefficients appointed to each of the selected variables.

## Data Sources

Data selection can be a demanding and intricate task, since a neural network's performance is directly attached to the data used to train it.

The gathered data, which is used in this project for testing and training purposes, has been extracted from several issues of *Significant Ships*, published by RINA, [3]. A range of issues from 1995 to 2007 were available to the author and resulted in 56 container ships, ranging from 94.27m to 334m with corresponding capacities from 478TEU up to 10,050TEU. For the selection of the variables' quality, from this widely accepted source, a number of discussions involving experienced individuals such as Prof. Ian Buxton and Dr Bryan Barrass of the

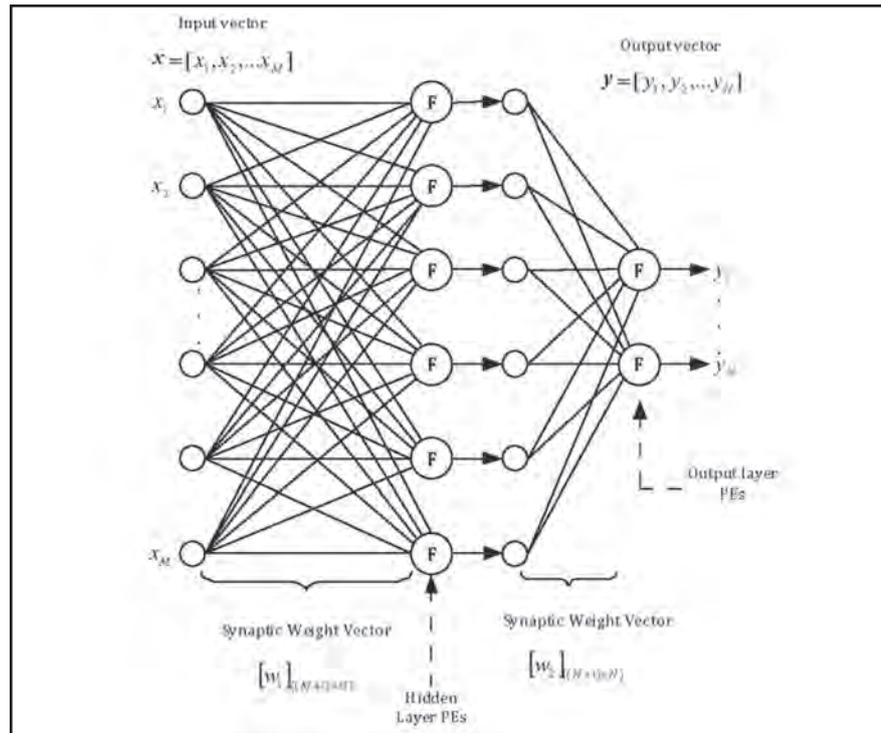


Fig. 1 General structure of an Artificial Neural Network.

School of Marine Science and Technology at Newcastle University took place and valuable advice was provided on the reliability of this source data.

## Selection of Variables

In order to develop a model to predict the lightship weight for container ship designs, the breakdown of the lightship weight into machinery, outfit and steel weight is critical and defining. For obtaining a successful input-output mapping, it is best to examine the variables that influence each category separately. However, the three weight sub-groups of steel, outfit and machinery were not given explicitly in the *Significant Ships* issues and only an explicit value of the total lightship weight was given; thence, they could not be determined separately in this study.

Also, understanding the data's physical meaning and relation is vital for the user for

evaluation of the results, since networks do not provide any physical sense of its findings in relationships. Based on existing knowledge, the selected sixteen input variables available from the issues of *Significant Ships* are: length between perpendiculars,  $L_{bp}$ , breadth moulded,  $B_{mld}$ , draught scantling,  $T_s$ , draught design,  $T_d$ , depth moulded to main deck,  $D_{mld}$ , block coefficient,  $C_b$ , number of transverse bulkheads,  $BHD_{transverse}$ , number of decks, proportion in (%) of high tensile steel,  $HTS_{\%}$ , service speed,  $V_s$ , in knots, payload capacity, in TEUs, number of officers, number of crew members, number of single rooms, SR, number of double rooms, DR, extended cargo handling gear capacity,  $^{(CHG)}_{capacity}$ , in tonnes. The single output variable is the lightship weight,  $W_{lightship}$ .

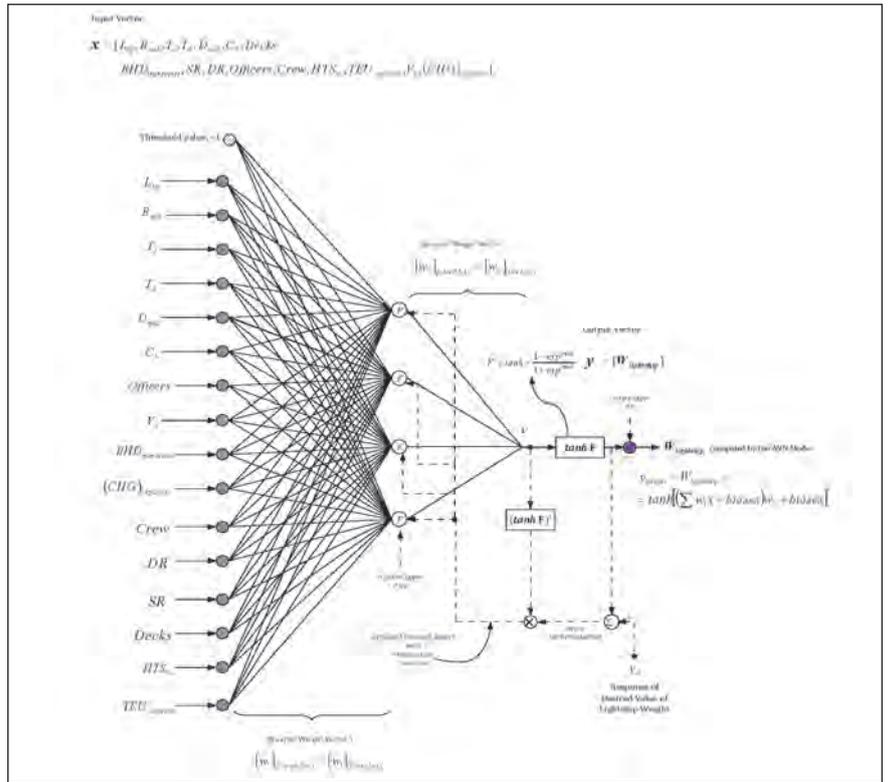
## ANN Architecture

A typical architecture (structure) of a feed-forward ANN model can be

Fig. 2. General ANN structure representation.

demonstrated in Fig. 1, in which the left column is the input layer, the right most column is the output layer, and in between the input and output layers is one hidden layer; since the efficiency and accuracy of this topology is sufficient for the present application. In each layer there are several Processing Elements (PE) (also called 'neurons'). Fig. 1 also shows that the number of PEs in the input layer is equal to the number of input variables, while the number in the output layer is equal to the number of output variables.

The architecture selected for the topology representation of the actual ANN model is that of a generalised feed-forward neural network, with only one hidden layer, and undergoes supervised training; That is, the data provided to the network are represented through the input layer, they are re-presented in the hidden layer for their features and



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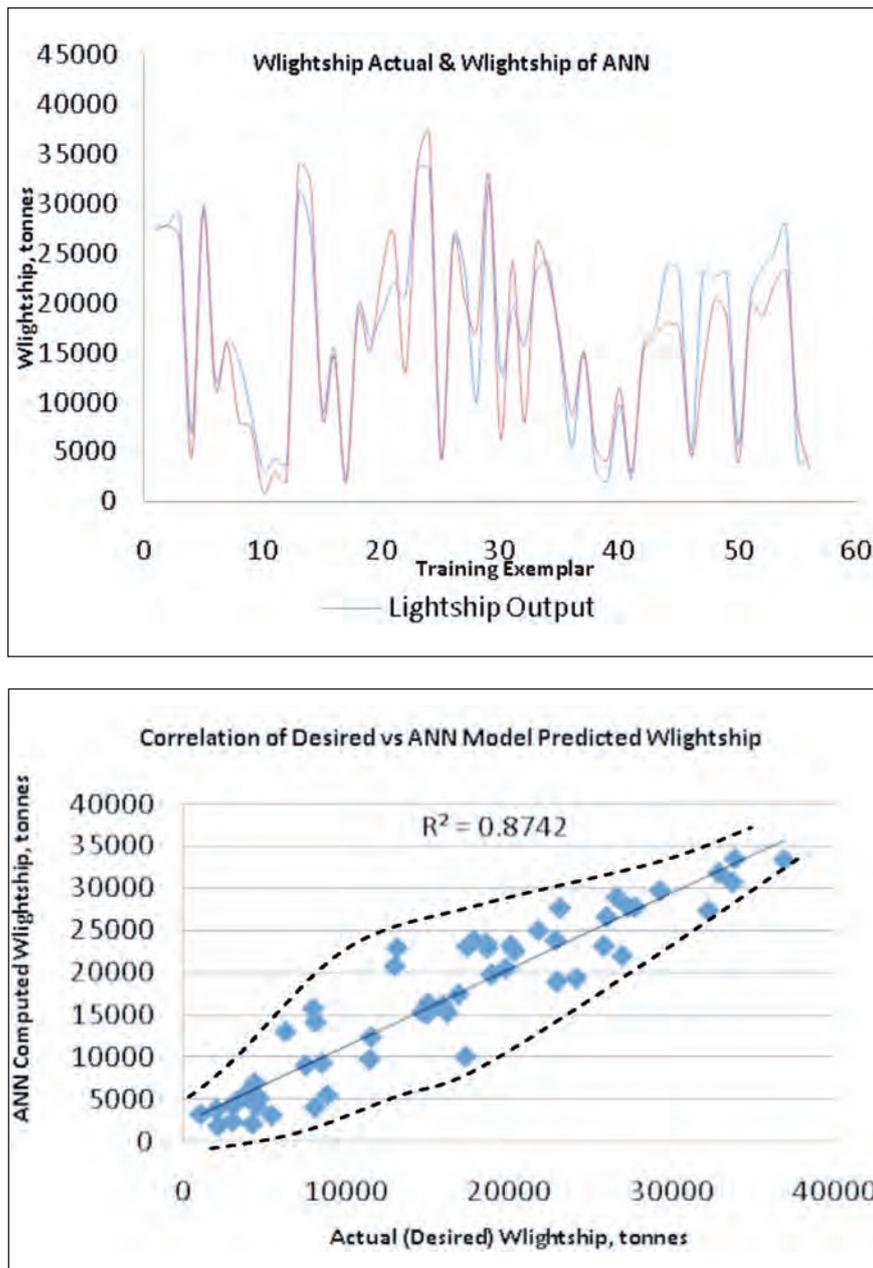


Fig. 4. Correlation of experimental and predicted results of ANN model.

nature to be extracted and then they result in the output. If input - output data has considerable error, then these errors are being fed back (error back-propagation) to the input layer so that the connections between the variables can be adjusted again. Hence, by using the gradient descent technique for the errors, the accuracy of the lightship weight approximation is improved. This cycle is called an epoch and several epochs are usually needed to train neural networks depending on their size and number of data entered.

The number of PEs in the input layer is equal to the number of input variables (16),

and the number of PEs in the output layer is 1, which returns the corresponding lightship weight,  $W_{lightship}$ . The number of PEs in the hidden layer is a key parameter to determine in the development of ANN models, [6]. It has a direct effect on the model quality in terms of accuracy. There is no general rule to determine this number hence, a trial-and-error process was used. The number of PEs in the hidden layer was set to four and the use of a genetic algorithm (GA) option was selected to consult for the optimum number.

The network was trained by using static back-propagation, being the learning paradigm, and momentum learning, being

Fig. 3. Comparison of actual and ANN output achieved after 4 trainings.

the learning rule, for optimum search for the global minimum error, which can speed up and stabilise convergence during the training process. This ANN structure is advantageous due to its ease of use, and ability of approximating any input - output map.

### Results of the ANN Model

The ranges of all the variables of the experimental data are shown in Table 1. For developing the ANN model for lightship weight prediction the ANN softwares “Neurosolutions” & “Neurosolutions for Excel”, [7] were used.

The training of the ANN was terminated at the 150th epoch. Out of 56 container ships gathered, forty-five were used to train the neural network and the remaining eleven were used as cross validation data. During cross validation the network’s response was tested in terms of how well it was trained on the training data.

By using four PEs in the hidden layer, (Fig. 2), the errors for this model in the mean square error (MSE) term resulted 0.0058 in training and 0.00612 in cross-validation, both at the 150th iteration and both of which are small. Based on these errors, Neurosolutions provided the best loaded coefficients achieved for the matrix synaptic connections and are to be appointed to each of the 16 input variables. In addition, the linear correlation is 0.935, which is fairly close to 1. These indicate that the developed ANN model is quite accurate. Fig. 2 also shows the structure representation of this ANN model.

A useful observation that can be drawn off Fig. 4 scatter diagram is that the ANN predicted quite successfully the correct lightship weight values for container ships between  $95m < L_{tp} < 195m$  and  $285m < L_{tp} < 330m$ .

Uncertainty analysis calculations were performed according to ASME Standards PTC 19.1 – 1998, [8]. The calculations were performed using the sensitivity results for the 16 input parameters of the basic database which used to train the network. A 32% uncertainty level was obtained which means that the ANN model seems to have confidence of 78%.

The functional relationship resulted by the trained network by no means is similar to the

Ship Name	Actual (tonnes)	ANN (tonnes)	Absolute Difference (tonnes)	Absolute Error (%)
Marwan	7015	7747.54	732.54	7.33
NEDLL OYD River Plate	7007	9072.94	2065.94	20.66
NUEV O Leon	12677	14854.7	2177.7	21.77
CONTS HIP Pacific	7030	10349.6	3319.6	33.20
San Lorenzo	6992	7736.04	744.04	7.44
Tokyo Senator	12517	13479.7	962.7	9.63
Cecilei MAER SK	9020	8645.48	374.52	3.75

Table 1. ANN tested on Lightship Weight results of previously unseen container ships, extracted from *Significant Ships 1993-1994*.

known and well established mathematical models, such as regression techniques. For given case-values of the 16 variables, they enter the (17x1) input vector  $x$ , (Fig. 2). Input vector follows a hyperbolic tangent activation process and the addition of a bias equal to one. The product of the (4x17)  $w_1$  matrix and the hyperbolic tangent function of  $x$  follows and the (4 x 1) matrix is the result, undergoes hyperbolic tangent activation again, along with a bias addition on top of the four rows, i.e. on top of the four hidden units. The resultant (5x1) matrix is multiplied by the (1x5) transpose of  $w_2$ . The result of the above multiplication is a single value which passes through the hyperbolic tangent function and the estimate of lightship weight is collected in tonnes.

### ANN Validity Tests on Previously Unseen Container Ship Data

Firstly, the ANN was tested on generalisation performance using seven previously unseen to it container ships (Table 2), from *Significant Ships 1993 - 1994*, [3]. Four out of seven lightship results provided values which deviated within + \_ 10% from their corresponding actual values. This test gave a satisfactory initial impression of the ANN model as a reasonably good lightship weight approximator.

In case the ANN had been trained on 100 container ships the accuracy of its predictions would be much improved, and having 200 container ships even more accurate.

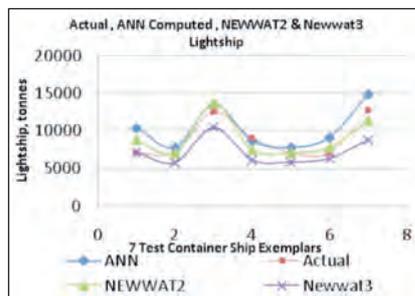


Fig.5. Performance of ANN, NEWWAT2 & Newwat3 tested on the 7 previously unseen Container Ships.

The last test showed comparisons of the ANN computed lightship for the seven test-ships and the ones computed by NEWWAT2 and Newwat3. NEWWAT2 and Newwat3 are computer programs designed for the determination of design particulars for deadweight oriented vessels with dimensional ratio combinations of about  $L_{/B} = 6.12$ ,  $B_{/D} = 1.86$  and  $T_{/D} = 0.72$ . The results can be found on Table 7.6 at [9].

The ANN performed within 10% error with a 60% successful estimate, 43% for NEWWAT2 and 14% for Newwat3. The interesting and useful observation here is that NEWWAT2 and Newwat3 deviated with the same error in all seven test ships while the ANN did not, (Fig. 5). This indicates the useful comparison that can be made between statistical correlations – empirical formulae and the nonlinear approximator.

### Conclusions

Artificial Neural Networks have recently become the focus of much attention, largely because they can identify and learn correlated patterns between sets of input data and corresponding target values. They mimic the human learning process and can handle problems involving highly nonlinear and complex data. After training ANNs are used to predict outcomes from new input data.

It is found that the ANN method can accurately predict the initial lightship weight estimate of container carrier designs as with empirical formulae derived by regression analysis. Nevertheless, it must be noted that the main objective of this paper was to investigate and demonstrate the applicability, weaknesses and strengths of using ANNs in developing design formulae.

When applied correctly, a neural or adaptive system may considerably outperform other methods. Also, these adaptive systems have been configured delivering best results, in many other areas of important engineering applications such as signal enhancement, noise cancellation, prediction, and control. **NA**

George Sachinoglou AMRINA, has graduated from TEI of Athens (2006), Department of Marine Engineering & Naval Architecture. Graduated (2009) from School of Marine Science & Technology of Newcastle University, BEng (Hons) Naval Architecture, MSc (Hons) Naval Architecture.

Contact email: ambrose\_1984@hotmail.com

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# IMO ready to step up to the plate

The International Maritime Organization's (IMO) director for the marine environment division, Miguel Palomares, says the institution is ready to regulate by enacting CO<sub>2</sub> emission reduction measures that can be effective immediately.

**C**openhagen will host the climate change conference on the 7-18 December and depending on what is agreed at this meeting some old habits that people were used to may be forced to change in the face of man made and potentially catastrophic climate change.

The IMO, along with the rest of the global maritime industry, will want to know what the world's leaders will expect of them. The political masters in Copenhagen will decide what role the IMO has to play in delivering significant reductions in greenhouse gases (GHG) from the maritime industry.

## CBDR

After Kyoto in 1997 shipping was charged with finding solutions to the levels of greenhouse gas (GHG) emissions being emitted by the global fleet, but Mr Palomares says that it was that very treaty itself, with the stated aim of reducing GHG, which has been preventing the IMO, from moving on.

"The principle of common but differentiated responsibility (CBDR) conflicts with the IMO's philosophy as enshrined in its constitutive to the IMO Convention, which recognises equal treatment for all ships engaged in international trade," explains Mr Palomares.

Effectively the CBDR allows developing countries that generally speaking are not the world's main polluters to have a lower responsibility than the developed, so-called Annex I countries of the industrialised world.

He explains that the difficulty for the maritime industry is that if this principle were to be literally applied to shipping and the developing nations were exempt from implementing the IMO regulations "Only 25% of the world's merchant fleet, which is the proportion of ships now flagged in Annex I countries, would be obliged



Miguel Palomares, director, marine environment division.

to comply and this percentage would be drastically and rapidly reduced as many of these ships would change their flag to non-Annex I registries; in this situation, the contribution of international shipping to the wider efforts to arrest climate change would be negligible", said Mr Palomares.

A number of developing countries with strong economies want to maintain their effective opt out by insisting on the application of the CBDR principle, which means that ships registered by these countries would not be forced by treaty to meet the same stringent controls as those flagged in the world's industrialised states.

Although Mr Palomares would not be drawn on which countries they were it is generally accepted that there are five emerging economies to which the principle of CBDR applies and they include India and China.

If politicians decide in Copenhagen to uphold the IMO's guiding principle of "equal or non-discriminatory regulation of all ships in international trade, irrespective of flag or ownership", over the Kyoto's principle of CBDR then the organisation will be able to move ahead with a raft of new regulations that would considerably reduce GHG emissions from shipping. One way that this might happen is a suspension

of the CBDR with regards to the maritime industry or a more flexible interpretation of the principle that would enable IMO to regulate with the interests of developing countries firmly in mind.

If and when the ruling has taken place and the IMO is given the green light by the Copenhagen Conference a new debate will ensue within the maritime institution that will see CO<sub>2</sub> reduction regulations added to an existing IMO instrument, possibly MARPOL Annex VI, which contains regulations for the prevention of pollution from ships, although CO<sub>2</sub> is not currently considered a pollutant in the strict sense of the word.

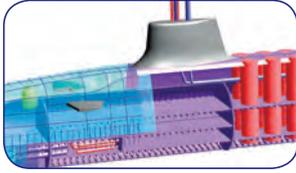
## Work plan

Following a decision of the 23 IMO Assembly, in 2005 the Marine Environment Protection Committee (MEPC) adopted a work plan and an associated timetable setting out the development of technical, operational and market based measures that would see the industry significantly reduce its emissions as a result.

That plan is currently blocked by the emerging economies because they say these measures should only be taken by the Annex I countries and so the IMO arrived at an impasse the solution to which, can only be found by their political masters.

In pursuing the work plan, the MEPC has developed technical measures in the shape of an Energy Efficiency Design Index (EEDI), which will apply to new ships. The index, together with guidelines for its application and verification has been circulated for voluntary application and is expected to be refined by MEPC 60 in March 2010 for enactment.

The EEDI is comprised of a complex formula that "will challenge designers and builders to develop ships that are intrinsically energy efficient and should engage the naval architecture profession



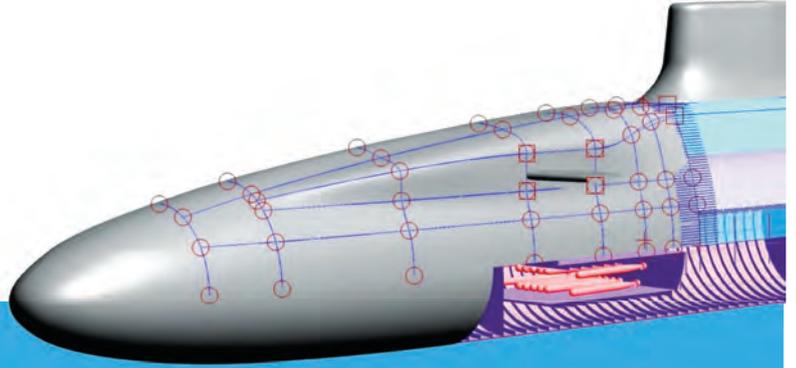
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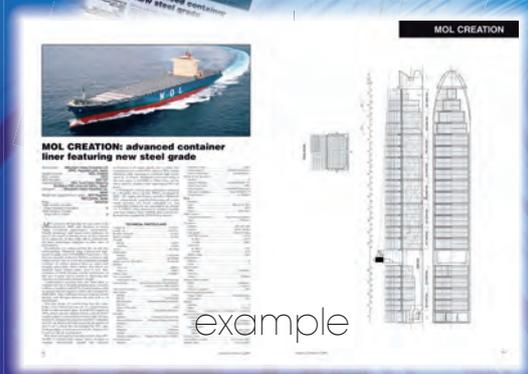
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in finding the necessary technological solutions”, said Mr Palomares.

The index will include a number of parameters and as long as it remains below a certain pre-set limit the vessel will meet the requirements. That limit has yet to be fixed, but it could be agreed upon as early as March 2010.

Existing vessels and new ships would also have to show that they are operating in an efficient manner through the implementation of a Ship Energy Efficiency Management Plan (SEEMP), which has also been developed and circulated for finalisation at MEPC 60. This would follow a philosophy similar to the one underpinning the International Safety Management Code.

Attached to the SEEMP is guidance on best practices, which has been developed in close cooperation with the industry and an Energy Efficiency Operational Indicator (EEOI) that is another formula that enables the owner/operator to gauge the effectiveness of the efficiency measures undertaken. The EEOI will not only measure the energy used for propulsion, but the entire energy consumption of the ship. This may well be one of the main tools to be used by flag States and port State control to monitor compliance.

“All the guidelines necessary to implement the EEDI and the SEEMP are in place as agreed at MEPC 59 and will be revisited at MEPC 60 to allow the Committee to polish them following the comments that may be received from member states and the industry”, explained Mr Palomares.

All that remains to decide now is the market based instrument that should be put in place to supplement the emission reductions achieved by the above technical and operational measures. At present there are two main streams of thought, an Emissions Trading Scheme (ETS), basically a cap-and-trade system and an International Contribution Fund, that would be fed by levying a charge on bunkers.

“Both schemes will probably require the establishment of an international fund to collect the revenues generated by the chosen mechanism. The Committee has already agreed that the greater part of these revenues, provisionally estimated at several billion US dollars per year, should

be used for climate change mitigation and adaptation purposes in developing countries only, which in turn would be a way of satisfying the CBDR principle” said Mr Palomares.

However, he pointed out that the creation of an international fund could necessitate the adoption of a new treaty instrument to be developed by the MEPC and then administered by an appropriate intergovernmental body, since the present

“If politicians decide in Copenhagen to uphold the IMO’s guiding principle of “equal or non-discriminatory regulation of all ships in international trade, irrespective of flag or ownership over the Kyoto’s principle of CBDR then the organisation will be able to move ahead with a raft of new regulations”

structure of the IMO Secretariat was not geared to dealing with such complex market issues.

The IMO, however, does have experience in creating similar international funds, such as the International Oil Pollution Compensation Fund in the 1990s and its subsequent Protocols.

Effectively the IMO created this fund and then a secretariat was established to run it. “The IMO gave birth to the child and then entrusted an appropriate

organisation with its nurturing,” said Mr Palomares.

He points out that there could be other solutions: the USA has devised an alternative system using the EEDI as a yardstick, which could potentially bridge the two main streams and make it acceptable. Though at the moment Mr.Palomares admits: “the debate is rather polarised”.

Mr Palomares does not accept that the IMO has been slow to regulate, he believes that if the politicians make the decisions that will set the IMO free to regulate international shipping, as it has been doing for the past five decades, then consensus will not be difficult to find. But, he does not simply lay all the responsibility onto the politicians, he recognises that the industry has a crucial role to play, and shipowners must take the initiative in reducing emissions. A trend that is visible at present, with the shipping industry fully behind the IMO’s endeavours.

“The shipping industry has come a very long way already, since the 1970s and 80s,” he points out. “Owners are using ships that are bigger, have better hydrodynamics and more efficient engines”.

“Then”, he says, “there is the ‘low hanging fruit’”, the simple and cost effective changes that the industry can readily make, like managing speed, sailing with optimum trim, minimising ballast trips, using last generation hull paints, and many more measures, all of which are explained in the SEEMP.

Mr Palomares also points out that a number of mainly “Nordic” owners/operators are already applying many of these energy efficiency measures to their vessels and they are now accruing the benefits of those fuel-saving measures.

“The SEEMP will encourage companies to consider what can be done immediately that will be of low cost, followed by other higher-priced measures, in the knowledge that the achieved reductions in fuel consumption may well pay for the implementation of the reduction measures and, at the same time, serve the climate change cause”, said Mr Palomares.

In this context Copenhagen could be a watershed for the maritime industry, but if the politicians fail to play their part the opportunity could be lost. **NA**

# Made to measure: intelligent sensors are de rigueur for the smart owner

As elsewhere in life the move to digital technology is evident in many aspects of ship operation today, but one area that has been slow to take the step forward is tank gauging and data acquisition systems.

From a cost perspective the predominant technology employed for level measurement of ballast, service, and bunker tanks is still the hydrostatic head or pressure principle. The most basic of this technology is the direct “bubbler” or air reactive gauge but since it is essential on most modern vessels it is essential that data is in electronic format the direct electronic sensor with a 4-20mA analogue signal is probably the most cost effective and certainly the most flexible to install.

The past argument that a directly installed sensor could be less reliable is certainly not true today. Mechanically, many quality marine sensors have been specifically developed to withstand the rigours and corrosive aspects of these applications. Electrically, too, correct design considerations ensure their performance and reliability is not compromised by thermal and other adverse affects imparted by the duty.

Meeting all the above criteria and ensuring compliance with Intrinsic Safety parameters has in the past only been practical using analogue electronic circuits and clearly millions of such sensors have been installed onboard ships of all types.

That all sounds well and good, but that is where the development has remained for many years now and as with most things in life and at sea there is an increasing downside to this technology.

In a conventional arrangement each transmitter requires its own cabling which runs from the point of measurement to the point of display. Some systems have adopted marshalling arrangements where sensor cabling is routed to one or more instrument cabinets which convert the 4-20mA signal to a digital format for onward transmission, but these provide only a half-way solution and conversion errors compromise on the accuracy of the overall measurement. The downside is that although the cost of



A digital transmitter sharing three different mounting options.

sensors has gradually reduced as demand increases, there is a greatly increased cost of cable and skilled labour to install and commission these systems. In many larger systems the cost of installation can exceed the cost of the system components.

After more than two years of shipboard trials of both Royal Navy platforms and commercial ships PSM Instrumentation is releasing its Intelligent Ceramic Transmitter (iCT) and associated system products. The iCT is type approved and ATEX certified and for the first time enables the full implementation of a digital tank gauging system. It is arguably the most advanced sensor system available for the duty and when one reviews its advantages and features it is clear that there should be significant benefits derived by the shipyard, system installer and the operator.

In the first instance PSM calculates that over 70% of the cost of cable and installation components including cable trays, trunking, junction boxes, penetrators etc can be saved on an average system.

In detail, the iCT measures tank level hydrostatically using an ultra stable ceramic capacitance cell that contains an embedded microprocessor that processes the level measurement locally to provide a direct



A typical screenshot of a tank level monitoring system that would be located in the cargo control or bridge.

digital output. The output format employs industry standard MODBUS protocol for universal compatibility transmitting onto a robust and proven RS485 standard.

Compared to a conventional analogue signal which just represents the pressure measured, the data output may be scaled directly within the iCT sensor for tank sounding tables, sensor offsets, and product specific gravity, greatly simplifying the processing needed at the display end. In addition iCT incorporates a temperature sensor as a standard feature so that tank temperature is also available.

All parameters are held in non-volatile memory and remotely accessible / editable from a standard laptop.

In practice this new technology gives clear benefits to both the shipyard when installing and commissioning the system, and to the owner when the equipment is in service.

## Installation & Commissioning Benefits

Being addressable over RS485 and with each transmitter having its own unique identification number enables a multi-drop connection arrangement where, all



HMS Ocean has refitted fuel and ballast tank management system with PSM.



Trawlers have been equipped with PSM for accurate digital data for tank levels, volumes and temperature.

transmitters can share the same power and communications cables. The iCT is supported by a range of purpose developed termination boxes which ensure simple network construction.

It is mentioned above that nowadays the cost of installing and commissioning a gauging system can easily exceed the cost of the equipment itself. For example the use of a multi-drop arrangement could typically show savings on a container ship of 15,000m of cable. The time taken to lay that amount of cable varies with the complexity of the vessel type, but the time, cost and weight saving benefits are immediately apparent.

The iCT transmitter operates with significantly lower power requirements than

a conventional analogue transmitter. This again shows cost benefits when considering applications where the installation must be to intrinsically safe standards. iCT carries ATEX approval for use in hazardous zones, but like all other Intelligent Sensors (I.S.) equipment it must be protected by a suitable energy limiting barrier or isolator located in the safe area.

Unlike all other level equipment it can be protected by a purpose developed and ATEX approved barrier from PSM. While a conventional installation with analogue transmitters will require a barrier for each and every instrument, the low power requirement of the iCT means that one single Barrier can be used to provide protection for a single RS485 loop



Another typical screenshot of the monitoring system.

containing up to 127 iCT transmitters. When it is considered that iCT can also provide temperature measurement the installation time and hardware cost savings are fully apparent.

Once a system is installed the commissioning stage is also greatly simplified. All transmitters are remotely addressable by connecting a laptop at any point in the data loop, and using configuration software included with the iCT they can be programmed to suit the specific application. This extends to resetting the calibrated range and zero offsets, a task that, on a conventional transmitter would require access to the tank / transmitter and the physical application of pressure using a test set. With iCT no such access is needed and calibration can be set or changed even when the tank is full of liquid.

With conventional transmitters each has to be factory set for its intended duty, if one is installed in the wrong tank rework and extra cost is unavoidable. With iCT this is not an issue, it can simply be reprogrammed to suit. The benefits of a multi-drop remotely addressable are applicable across ships of all sizes and for both newbuild and retrofits.

In an example of where the iCT's attributes have been of direct benefit to an owners business, PSM has recently equipped a series of trawlers where, accurate digital data from each sensor now provides a time stamped record of the tank levels, volume and temperature of fish caught for the entire duration of the voyage. This real-time information of storage conditions provides a traceable quality of the fish. Being able to provide this quality assurance means that fish can be pre-sold at the best prices long before the vessel returns to port.



# Orderbook masks flaws in Spanish yard economics

A close look at the trend in newbuild orders over recent years sheds light on the impact of the global economic downturn for the Spanish shipbuilding sector and raises the prospect of leaner times ahead, write Iñaki Carrera and Brian Reyes.

Spanish yards are currently bulging at the seams with contracts for specialised, high-tech, vessels ranging from tugs and ferries to trawlers, dredgers and offshore support vessels.

There is enough work to keep most yards busy through to 2012, a remarkable turnaround for a sector that only five years ago was on the brink of crisis.

On the face of it, Spain's shipbuilders have so far shrugged off the credit crunch.

But a closer look at the data suggests a worrying shift. Last year, as the first signs of financial strife began to show, the orders began to fizzle out.

Orders for newbuilds plunged 42% to 220,332 gt last year, according to the Gerencia del Sector Naval, the government body that monitors activity in the sector. Privately-owned yards in the Basque region captured the lion's share of the business, securing 32.4% of all new contracts in tonnage terms, but the signs of a bleak trading climate were clearly evident.

The drop was largely the result of a dearth of orders from foreign owners for large vessels.

In terms of the number of vessels contracted, the year-on-year change was little more than a slight dip from 79 to 75 ships. Ironically, the larger yards secured more orders last year – 30 ships in 2008 compared to 23 in 2007 – but representing a 22% reduction in tonnage terms, from 102,156gt in 2007 to 80,137gt last year.

As for export vessels, the number of ships ordered by foreign owners dropped from 56 ships in 2007 to 45 in 2008, while tonnage halved from 280,475gt two years ago to 140,185gt last year.

This year the situation with new orders is even worse.

Yards in Spain's Northern regions of Asturias, Galicia and the Basque country – where most of the shipbuilding sector is concentrated – have secured just three new orders in 2009, clear evidence of how the economic slowdown is filtering through to the slipways.

## Bleak future for Northern spanish yards

Yards in the north of Spain, where most of the shipbuilding sector is based, have secured just three orders this year with which to bolster a fast-dwindling workload.

The workload at most yards is currently good for two years. Despite hopes for a boom in orders on the back of the Russian fishing fleet renewal programme and other attractive projects of that nature, the present reality in terms of new business is bleak.

In January this year, Asturian yard Astilleros Gondan signed a contract with the Norwegian company Simon Møkster Shipping to build a multi field offshore support vessel, sister ship to the *Stril Herkules* which is already in operation.

Gondan said its present orderbook is “the largest the yard has ever had” and includes plans to work on six ships simultaneously, when the normal process is work on a maximum of three ships.

The workload includes several tugs for Italian operator Neri for use in the port of Livorno.

At the Galician yard Construcciones Navales P. Freire, the University of Qatar's order for a high-tech oceanographic vessel equipped with an ROV will generate 120,000 work hours for the Spanish company and see it through to the second half of 2011.

The third order went to Metalships & Docks, also in Galicia. The €137million contract from an undisclosed Norwegian owner is for construction of an offshore vessel that will generate half a million hours of work at the yard.

The 165m vessel, part of which has been built outside Spain, will be among the largest units ever built at the yard and is the second such order secured in consecutive years.

Metalships is also negotiating the construction of another offshore support vessel, the last in a five-ship series valued at €500million.

In Asturias, Astilleros Gondan won a contract to build a 97m Multi Field Support Vessel for Norwegian owner Simon Møkster Shipping.

West along the northern coastline, the Galician yard Freire won an order to build an oceanographic survey vessel for the University of Qatar.

Still in Galicia, Metalships & Docks won an order for a 165m offshore support vessel from

another Norwegian owner.

Compared to 2007, this was paltry pickings.

“The business has slowed down, primarily, as a result of the sharp drop in freight rates, which has cooled interest in orders for cargo ships,” said one Basque yard manager.

“Coupled to this is the difficulty that owners are facing when it comes to securing financing for new vessels.”

"If owners can't secure financing, there's nothing for us to do."

"That's where we're at."

Spanish yards are facing tough competition, particularly from facilities in the Middle East and the Far East which benefit from lower labour costs and currency exchange rates.

The strength of the euro against the dollar has proved a stumbling block in many negotiations.

"The international market works in dollars, but our costs are in euros," the manager said. "This means that we have to make payments in euros, which is currently strong, while getting paid in dollars, which is weak."

"To complicate matters even further, the price of steel for ships has not gone down despite the crisis."

"Ultimately, the present situation has become about survival."

### Cancellations

The prospect of cancellations has also sent shockwaves through the sector and that cracks have started to appear in the current orderbook.

One stark example: Galician yards, which account for half of the Spanish shipbuilding sector in tonnage terms, have lost some €300million as a result of cancellations on various orders, including some where the construction work was already well advanced.

The difficult circumstances raise the prospect of yard closure in the coming months and at least three important auxiliary firms that depend on shipbuilding for work have temporarily laid off workers to ease the strain.

Industry sources say the difficulties arise because owners simply have not got the money to meet payments.

"Their access to credit is restricted, they can't obtain financing and they pounce on the shortest of delays in delivery schedules to opt out of contracts," said a spokesman for Aclunaga, the Galician Maritime Cluster, which brings together companies active in the shipbuilding sector.

Another stark example: In the Ria de Vigo, home to most of Galicia's shipyards, owners have cancelled three orders.

Factoría Vulcano, for example, was hit hard by Norway's Petroleum Geo Services' decision

to cancel an order for two seismic vessels due to timetable delays. These two ships would have represented income of €200million for the Vigo yard.

The yard is taking legal action over the contract with the Norwegian company and is seeking damages for the cancellation. It is also discussing the sale of the two vessels and is confident that the impasse will be resolved in the short term, even though ship prices have dropped by 35% since the order was placed.

Vulcano's fortunes also affect its subsidiary yard in Asturias, Factorias Juliana, which faced bankruptcy and closure.

The sale of the seismic ships would allow for a cash injection that would bring Juliana, which is working on a cement carrier, back from the brink of liquidation and appease impatient creditors.

Another Vigo yard, M Cies, is also in difficulties over a cancelled passenger ship order. The cancellation has created "a total lack of liquidity", one yard official said, despite an orderbook that in theory should keep the yard busy until 2011.



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### Softening the blow

The good news in all of this is that the strength of the current orderbook means Spanish yards have a two to three-year cushion to soften the blow and hope for an upturn in the global economy and, by extension, the maritime sector.

Experts suggest that Spanish yards have adopted a conservative approach that has allowed them to consolidate their position during the good years to help them ride out leaner times.

This success is largely due to a strategy that focuses on high-value, high-tech ships, drawing on decades of experience and a rich maritime heritage that allows Spanish yards to add value to specialised orders.

This focus has helped Spain forge a niche for itself in the international shipbuilding sector and, until recently, largely avoid the wide scale cancellations that have begun to hit Asian yards following the slump in the freight markets.

And despite the lack of orders, the interest from owners is still there.

Although the number of sealed contracts

has dropped dramatically, the level of enquiries remains at an 'acceptable' level.

"Having said that, it's not as strong as in the years prior to the crisis, but at that point we registered extraordinary demand from owners," the yard source said.

Yards in Galicia and Asturias in particular are pinning great hope in plans by the Russian government to embark on a wide-ranging renewal of the country's hefty trawler fleet.

A group of yards including Armón, Vulcano, Freire, Metalships and Polyships have approached Russia's federal Fisheries Agency with a proposal to construct in Vigo the 500 factory ships that Russia wants operational by 2020.

The Russian government has offered land and infrastructure for the Spanish yards to set up operations near Kaliningrad but they have in turn come back with an amended proposal that envisages building the first vessels in Spain.

At that stage, Russian engineers would be included in the project so as to gain valuable

know-how that could then be transferred to Russia's own yards.

The Russian authorities have also approached another Galician yard, Hijos de J. Barreras, to sound out interest in the fleet renewal program. The Spanish yard said it would accept the technical design of the first prototypes but is insisting that at least 10 vessels be built at its Vigo yard.

Russians aside, there are other potential customers lined up too.

"A lot is being said about the possibility of building trawlers for the Russian government, but lots of businessmen from European and African countries are also visiting our yards to learn and see what we can offer," said a spokesman at Asturian yard Armón.

The focus, in essence, is on bringing in new orders while the slipways are busy.

A spokesman at Construcciones Navales P. Freire summed it up: "The aim at this time is to win an ample orderbook to inject security back into the sector before the workload runs out in 2012." *NA*

## Madrid backs maritime industry with cash

A government finance package has been awarded to the Spanish maritime industry in an effort to boost research and development and to help owners through the lean times as the credit crunch bites.

**T**he Spanish government recently approved a €65million financing package to help shipyards and national shipowners to ride out the credit crunch.

The bulk of the funds, €45.8million, are aimed at bolstering restructuring programmes at Spanish shipyards focused on technical research and development, as well as training schemes for workers.

In order to access the funds, yards must first obtain approval for programmes aimed at boosting competitiveness and productivity.

The balance of the package, just under €20million, is aimed at helping shipowners meet credit interest payments thereby obtain more flexible financing.

Access to the funding is structured in line with European Union (EU) state aid rules.

The government initiative reflects the

importance of the maritime sector to the Spanish economy.

According to government figures, there are currently some 8000 persons directly employed in ship building and ship repair, as well as a further 12,000 who work in auxiliary industries vital to both sectors. Another 6000 workers are employed in companies that supply materials and ancillary services to the yards.

According to the Spanish Maritime Cluster, a grouping established in late 2007 to bring together public and private entities from across the maritime sector, the maritime sector contributes 3.2% of Spain's GDP and directly employs 450,000 workers.

Including knock-on benefits, its contribution to GDP and employment rises to 7% and 1million workers respectively.

The SMC currently has around 50 members – including shipyards, ports,

banks, law firms, shipowners and industry associations, alongside official state bodies – and one of its key priorities for the year ahead is to boost its membership substantially.

Other key aims include marketing Spain as an "innovative maritime country", promoting competition and technological innovation, and boosting training for new entrants into the sector.

The initiatives to revitalise the maritime sector come at a time when some yards are up against the wall.

In the south of Spain two privately owned yards, Astilleros de Huelva and Astilleros de Sevilla, have witnessed labour strife as yard executives work to save the facilities from closure as credit lines dry up.

In Huelva, almost 70% of the workforce has been temporarily laid off until January as the yard teeters on the edge of collapse. *NA*

# Privatisation has profits for Bilbao yard

On the outskirts of the Basque city of Bilbao, a former state owned shipyard has recouped its leadership position in the sector and closed its first year as a privately-owned business with a hefty orderbook.

The Sestao shipyard, known in Bilbao as La Naval, ended 2008 with contracts for four ships representing 160,000gt, enough to guarantee work until 2011.

The yard was a key facility within the public shipbuilder Izar but was privatised when that company collapsed following a state aid investigation by the European Union.

It was taken over in 2007 by Construcciones Navales del Norte [CNN] and rapidly began rebuilding its reputation as one of Spain's premier yards.

In 2008, La Naval delivered the largest dredger ever built - the 223m, 52,000dwt *Cristóbal Colón* - to Belgian operator Jan de Nul.

With a 30,500m<sup>3</sup> capacity, the vessel is designed to be able dredge sand and rocks of up to half a metre in diameter from a depth of up to 142m.

The yard is now at work on a sister ship, the *Leiv Eiriksson*, which was launched last September and is slated for delivery in 2010.

Both vessels will work in the United Arab Emirates to build a network of artificial islands off the coast of Dubai. Jan de Nul has an option on a third ship in this series.

To build the first vessel in the series, *Cristóbal Colón*, the yard was financed by Banesto bank to the value of €260million. The second vessel is being financed with a



The largest dredger ever built, the 52,000dwt 223m *Christobel Colon* following its launch.

€158million credit from La Caixa.

The yard is also carrying out other work for Jan De Nul and last March launched a mining vessel, *Simon Stevin*, which also the largest ship of its type at 200m in length and with cargo capacity of 32,500tonnes.

La Naval is also building a fourth vessel for Jan de Nul, another mining ship destined for work off Papua New Guinea and able to extract mineral deposits at a depth of 1700m. This last vessel is valued at €240million and

is also being part-financed by La Caixa.

Looking ahead, yard executives are confident of winning new contracts in the coming years, particularly in the offshore sector.

One area of potential business is vessels designed to carry out installation and maintenance on wind generators in large offshore wind farms that are planned off the coasts of several European Union nations, including Spain itself. **NA**

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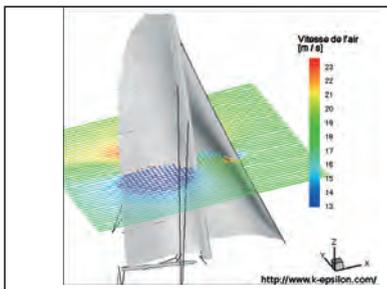
Cité de la Voile Eric Tabarly, Lorient, France



### FIRST NOTICE AND CALL FOR PAPERS



Organised again by the Cité de la Voile Eric Tabarly (CVET), the Naval Academy Research Institute (IRENav) and the Royal Institution of Naval Architects (RINA), INNOV'SAIL 2010 will build on the success of the 2008 conference to provide an international forum for the presentation and discussion of the latest scientific and technologic research and its application in the complex field of high performance yachts and competitive sailing. INNOV'SAIL 2010 will provide an opportunity for scientists, architects, engineers, sailors, sail makers and others involved in this fascinating and challenging field to come together to share skills and knowledge.



The conference will be held in the auditorium of the Cité de la Voile Eric Tabarly in Lorient/Brittany, which opened in the beginning of 2008 and is dedicated to the adventure which is modern sailing, of which Eric Tabarly is an emblem. The Cité is situated in the heart of the old submarine base which, after its closure in 1997, is being converted into a big nautical project centre called 'Le Nautic de Keroman'. Already, an important builder of multihull sailboats, a manufacturer of carbon masts, the logistical centre of the biggest European boat fittings supplier, and nine offshore racing teams are installed here, next to the Cité de la Voile Eric Tabarly. The language for the papers and presentation at the conference is English.



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# Navantia waits for EU to lift its cap

Navantia bides its time, waiting for EU rules to favour its return to building commercial vessels.

Spanish state-owned shipbuilder Navantia has maintained its position as a leader in global naval construction but, for now at least, its options in the civilian sector remain limited.

The European Union (EU) said earlier this year that it would not review a 2005 agreement with the Spanish government under which Navantia would limit civilian construction to 20% of its overall business until 2014.

The agreement was part of a deal that allowed Madrid to salvage what it could from Navantia's troubled predecessor Izar, which ran foul of state aid rules and collapsed.

Since its restructure, Navantia has focused on defence work and has not reached the 20% limit.

Ramón Iribarren, Navantia's new director for coordination,

“The year 2014 is not far away and we must start thinking about that change”

told reporters in Spain recently that the company would begin considering its options once the EU cap was lifted.

“The year 2014 is not far away and we must start thinking about that change,” he said.

Navantia's yards are performing well and are operating at nearly full capacity, with contracts from the Spanish navy and five other navies.

Vessels under construction range from frigates to submarines and the company boasts a wide range of well-proven designs.

In September it delivered the fourth frigate in a five-ship series ordered by Norway a decade ago.

Officials are bullish about the prospects for new contracts, including from existing customers Norway and Australia as well as from Latin American and African governments.

Even so, the state owned company ended 2008 with losses of €55.8million despite having returned positive results in 2007. Officials also expect to end this year in the red.

Perhaps ironically, the Sociedad estatal de Participaciones Industriales (SEPI), the state industrial holding company that owns Navantia, said the losses arose as a result of Navantia's civilian construction activity.

Navantia was building two ro-ro ferries for Spanish owner Trasmediterranea but the second ship was cancelled, while the first suffered from overrunning costs and labour strife. **NA**

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## Cernaival flies in the face of adversity

The impact of the economic slowdown has prompted shipbuilding and repair yards across Spain to hunker down to ride out the downturn, but in the south something unusual happened last year: one yard opened up for business.

**P**rivately-owned repair yard Astilleros Cernaival, in Spain's southern most port of Algeciras, has bucked the trend and reported solid business in its first year of business.

Where others are struggling to find work, Cernaival has had to turn away prompt enquiries because it simply has not got the space.

Since September last year, the yard has carried out around 80 jobs, including some 12 contracts that involved substantial steel replacement.

A key part of the yard's success is its unrivalled location overlooking the Strait of Gibraltar, a vital maritime chokepoint through which over 100,000 vessels sail every year.

That represents an ample market for yards in the region, which alongside Cernaival include Cammell Laird in Gibraltar, Cádiz in Spain and Lisnave in Portugal.

But, Cernaival also benefits from a business philosophy made possible by the company's family ownership structure.

The yards owners maintain a hands-on approach to the business that enables prompt decisions and flexible pricing when pitching for work.

The rates are competitive and aim to cover costs, working on the basis that once a ship is docked an owner is likely to capitalise on the downtime and carry out other work on the vessel.

"We look beyond the immediate job, where other yards perhaps won't take that risk," said commercial director Pablo de Celis.

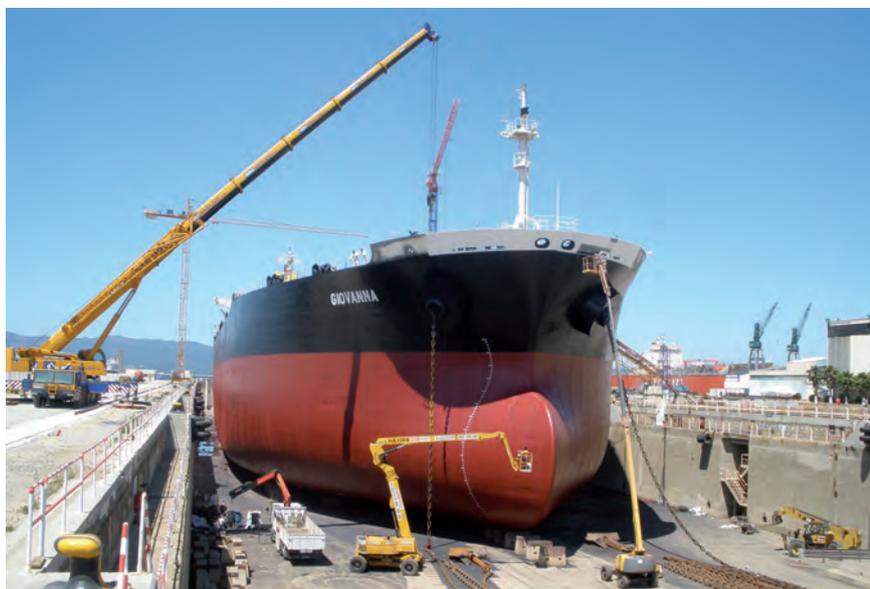
"If you're going to have a ship in a dock, then you're going to have other jobs done."

Cernaival's drydock lay abandoned for many years and was originally built to construct gas carriers, a project that never came to fruition.

In 2007, the company ploughed €42million into refurbishing the



An aerial view of the Cernaival yard with Gibraltar in the background.



Under repair, the *Giovanna* at Cernaival's drydock.

abandoned facility, which is located in the northern end of the bay of Gibraltar.

At 400m in length and 50m wide, the dry dock can easily accommodate two small vessels simultaneously. Astilleros Cernaival is also equipped with a floating dry dock.

The revamped facility was also fitted with powerful pumps able to fill or empty the dock in just a few hours, cutting down on docking times.

The latest investment paid for a complete overhaul of both the main dry dock itself and ancillary infrastructure

such as workshops and offices, which are situated on a 100,000m<sup>2</sup> plot.

Future investments will include a second caisson to split the dock in two and allow one vessel to be re-floated while work continues on a second ship.

The yard also hopes to establish a training wing to teach young apprentices who will then join the workforce.

Cernaival currently employs 150 permanent workers, though that figure has risen to as many as 600 depending on workload.

Recently the yard was working round-the-clock, with workers carrying out two 12-hour shifts that enable a fast turnaround.

“The focus on productivity and speed means that where other yards are quoting one and half months for a job, we can do it in one,” Mr de Celis said.

The work handled by Cernaival is varied. Recent jobs include replacement of 200 tonnes of steel on the bulker *Dobrush*, construction and installation of a new

rudder blade and stock on the product tanker *Biskra*, and overhauling the main and auxiliary engines, together with ample tube replacement, on the offshore supply ship *Vigeo Olufunke*.

“The focus on productivity and speed means that where other yards are quoting one and half months for a job, we can do it in one”

The yard also carried out painting and steelwork on the newly-built *Cristóbal Colón*, the world's largest dredger that was

recently delivered to Belgian operator Jan de Nul by Spanish yard Construcciones Navales del Norte.

Cernaival also scored a minor coup of sorts last month when it docked its first Maersk-owned vessel for routine repairs.

This is important for Cernaival because the AP Moller group operates major dedicated container transhipment terminals in Algeciras and nearby Tangiers and has many ships continuously transiting the area.

In time, Cernaival hopes that will translate into regular business from the world's largest shipowner.

So far, owners have adopted a ‘suck it and see’ approach to Cernaival, testing the yard out with a single job to see how it performs.

Cernaival's aim now is to attract return business and build up a portfolio of regular clients.

“We had to start from scratch and it hasn't been easy,” Mr de Celis said. “We had no reputation or customer base, but so far it's going well.” **NA**

## RINA – LLOYDS REGISTER EDUCATIONAL TRUST SHIP SAFETY AWARDS

Nominations are invited for the 2009 RINA - Lloyds Register Educational Trust Ship Safety Awards.  
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### The RINA- Lloyds Register Educational Trust Ship Safety Awards

recognise recent innovations or developments which have led to an improvement of safety at sea, or which have the potential to do so.

Entries may be submitted directly by individuals or teams from universities and industry from any country, and may cover design, construction, research, equipment or operations. Entries are judged on originality, quality of design, feasibility of production and contribution to ship safety.

Members who are aware of recent work by a university, company or organisation which has or could lead to an improvement in safety at sea are invited to nominate them for one of the Awards, giving brief details of the achievement. The nominated university, company or organisation will then be invited to submit an entry.

There are separate categories for universities and industry. An Award of £1500 is made in each of the categories and will be presented at the 2010 RINA Annual Dinner.

Requests for further information and expressions of interest should be forwarded to:



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## Barreras adapts to high oil prices

Spain's leading private shipyard has carved a lucrative niche out of rising oil prices and the need to locate subsea pockets of fossil fuels to meet consumer demand.

**H**ijos de J. Barreras, in the Galician province of Pontevedra, is building high-tech offshore seismic vessels that incorporate cutting edge design features developed by the yard's in-house team in cooperation with foreign companies.

Earlier this year Barreras delivered the first of four vessels to Norwegian company WesternGeco, part of a €500million contract scheduled for completion by next year.

The ships developed and built at the yard will be used to search for small reserves of oil and gas in locations around the world.

The *WG Columbus* is the product of a technical project carried out in close cooperation between the yard, the shipowner and Norwegian specialists Ulstein Design.

The ship is the first vessel ever constructed in Spain incorporating an inverted bow design. It is equipped with a helipad and has capacity for 169 persons, and will have its operational base in the Gulf of Mexico where it will carry out seismic research in US waters.

The complexity and added value of this project has established Barreras as an important player in the market for



The *Passio de Formentera* was delivered to Balearia this year. The ship is the second of a series of four.

sophisticated vessels of this type.

"A few years ago, when a barrel of oil was at US\$40 or US\$50, it wasn't viable to exploit certain types of undersea oil reserves," said José Francisco González Viñas, chairman of Barreras.

"These days, however, as a result of rising oil prices, we find ourselves in a

situation where every oil field that is found is profitable."

According to Mr Gonzalez about 70% of the orderbook in Galician yards is for offshore vessels, though Barreras itself has another important line of work that it has developed over recent years.

About half of the yard's workload involves design and construction of ro-pax ships, a market that has grown in recent years thanks largely to EU shortsea policies.

"This is a sector that has received an enormous impulse for operational reasons," Mr Gonzalez said.

"Before, nearly all non-bulk cargo used to be carried in containers but a lot of it is now in trailers and using ro-ro services."

"In Europe, cargo trade is split 50/50 between containers and ro-ro."

Barreras delivered one of four ro-pax vessels this year to Spanish owner Balearia, which operates services between the Iberian peninsula and Spain's island territories.

The *Passio de Formentera* was built at a cost of €42million and can carry 800 passengers as well as 304m of linear cargo and 540m for vehicles. **NA**

Starting commercial operations in June this year the *Passio de Formentera* has both stern and bow ramps and has a service speed of 20knots.



# Market realities force chemical market transition

Global economic downturn and oversupply of ships has left the chemical and product tanker industry in a precarious condition, but the bottom has now been reached say some observers with the implication that the only way is up.

Chemical production and demand is considered a lead economic indicator when economists look at the near future changes to the global economy. Chemical tankers and the movement of this cargo can also be considered to be an indicator of sorts, though if economists were to rely on the shipping sector of this market alone they may be forgiven for sounding the death knell.

Shipments of chemical products from the USA, the world's largest market, fell 14.7% from in July 2009 compared to July 2008, and was down 0.6% over the June figures, the latest statistics available from the US Department of Commerce.

Inventories for the chemical industry were also down year-on-year by 9.4% over the same



The launching of a tanker from a river bank in China.

The vessel edges backwards over the river (continued over the page).





Normally a channel would be cut into the bank, but the 'shipbuilders' discovered utility pipes buried beneath the bank, so they resorted to plan B.

period. As such demand for chemical goods was weak, while the clean products figures were worse, with a fall of 48.6% year-on-year in July 2009 for petroleum and coal products and 50.9% for products from refineries.

A weakening of the market in the USA, the world's largest economy, is generally understood to be an indication that the global

economy is also flagging. It is then likely that the demand for chemical and product tankers in the current market is also weakening. None of this is news to those currently experiencing the downturn, however, the deterioration in the markets allied to a newbuilding boom has seen the downturn in the market shift from a problem to a crisis.

According to chemical tanker industry consultants Ken Tree and Charles Barton, who collectively constitute KTR- Maritime Consulting and represent more than 100 years experience in the industry, there were 102 Chemical tankers in 1980. Twenty nine years later there are more than 3800 IMO classed chemical and product tankers with a further 818 due for delivery this year and, says Mr Barton, up to 100 ships are likely to be scrapped, a net increase in the fleet (in terms of the number of ships) of 18.86%. Indeed Mr Barton went on to say that even if there were to be a greater desire to scrap chemical tankers there is simply "not enough scrapping capacity in the world" to meet the maritime industry's needs.

Mr Tree said: "The scale of the industry is enormous. If we tied all the ships up along side one another, you could walk for over 80km and still be crossing their decks and if all the crews came ashore at the same time they would fill Wembley Stadium."



Making a splash, the ship successfully hits the water. Oh no we forgot the champagne.



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Too late! the vessel sails off.

Next year's new building scenario is likely to see a similar sorry tale so that even if the global economy turns the corner and demand starts to increase the fear is that the maritime sector servicing the chemicals industry will remain.

Responding to this depressed state of affairs some owners have been attempting to delay the delivery of ships while others have tried to cancel their orders. One such company Glenda, a joint venture of D'Amico of Italy and Glencore of Switzerland, cancelled its third of four 51,000dwt product tankers, the first two were cancelled earlier in the year following late delivery by SLS Shipbuilding and the third was cancelled for similar reasons while the expectation is that the fourth vessel will also be cancelled.

The shipyard stands to repay in the region of US\$120 million in initial payments for the cancellation of the four vessels (if the fourth is cancelled), which had been priced at around US\$48.6million each.

Meanwhile, SLS which faces arbitration over the first two Glenda ships is also in dispute with Norwegian owner Stolt-Nielsen after it too axed two 44,000dwt chemical tankers. Valued at US\$58 million each, these were the third and fourth in a series of four with the first two also cancelled earlier in the year. A Stolt statement confirmed that late delivery was also behind these cancellations and that it too was in arbitration with the troubled shipbuilder.

In India a further four 12,800dwt chemical carriers were cancelled by the owners Sea Tankers Management of Norway after the failure of the yard, Alcock Ashdown Gujarat, to secure financial partners.

The Indian yard had already said that it faced technical challenges in completing the order. A situation that may have helped this sector if such failings had come to light, not merely at Indian yards, but at the scores of new yards that sprang up during the new building boom in China. Some of these yards were no more than a rig on a beach or river bank.

Such was the newbuilding boom that lasted up to 2008, and orders made then



are still being delivered this year and next year, that new 'yards' that amounted to little more than cranes on a beach or a river bank were encouraged to open for business.

Fuelled by a global economy that was showing year-on-year growth the industry was showered in readily available credit and offers to build vessels. There appeared to be no limit to growth... until the economy slammed into the buffers. In Turkey between 2003 and 2008 that growth saw the yards' workforce grow from 10,000-12,000 staff to over 30,000 people.

*"If we tied all the ships up along side one another, you could walk for over 80km and still be crossing their decks and if all the crews came ashore at the same time they would fill Wembley Stadium."*

Not only did growth come to a sudden, and very unexpected, stop but the global economy began to shrink and credit was no longer available as banks that had over-extended themselves in the housing market sought to consolidate

and survive.

Consequently many yards in China have disappeared, a number in Korea are under threat and Berke Cicek, the vice president of Turkey's Cicek yard has said that it could be that only between five and 10 of the 48 yards in the Tuzla region will survive the downturn.

Mr Cicek said some of Tuzla's yards are capable of world - class standards but others are not". At other yards, he said, "consolidation will create opportunities", he concluded that: "Overall, it will be good for Turkish ship building. The challenge will come as the present shipbuilding boom subsides by early 2011 and the industry faces 'massive' new capacity online in Asia.

Consolidation in the ship owning division is also on the cards with Eitzen in talks with Indonesian firm, Berlian Laju Tankers. Eitzen expanded rapidly with 38 new vessels delivered since 2007 and a further 10 newbuildings still on order due to be delivered this year and next.

Eitzen was building with the expectation that demand for chemical tankers would increase substantially following new regulations requiring vegetable oils to be carried in chemical tankers from 2007 onwards.

Fragmentation in the ownership of chemical tanker operators and the laws of supply and demand also means that while such carriers as Odfjell, Stolt Nielsen and Jo Tankers will ride out the storm due to the substantial contract business that they have developed. Many smaller operators that depend far more on spot cargoes will find the going much tougher. **NA**



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# MCA ready to take tanker damage stability evidence to IMO

January's meeting at the International Maritime Organization (IMO) to discuss chemical and product tanker damage stability is expected to present some tough negotiations, but to resolve the issue with a workable compromise.

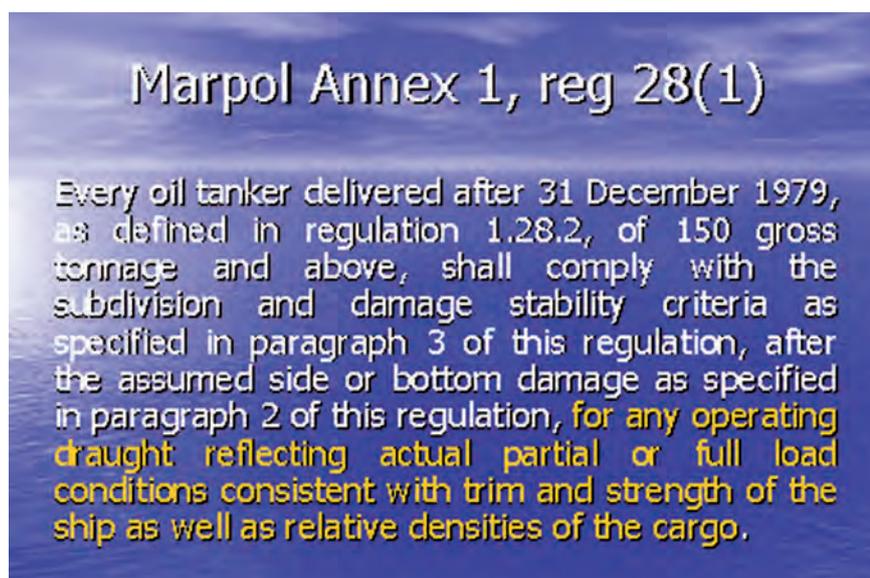
In January the debate over the enforcement of damage stability regulations at the International Maritime Organization (IMO) is expected to reach its climax. The Maritime and Coastguard Agency (MCA) believe that the battle is essentially environmental concerns over commerce while the owners associations say that it is a question of common sense rather than unnecessary regulation.

Ships are designed to withstand a certain amount of damage without the danger of the vessel being totally lost. But, accidents do happen and most vessels must be prepared to survive with at least some damage, particularly chemical and product tankers says the MCA.

Damage stability physics in chemical and product tankers is different to most other dry cargo and passenger ships according to the MCA and it is looking to ensure compliance through the IMO.

Due to the large number of tanks and the different chemicals carried that can have differing specific gravity the damage stability of a chemical tanker can vary from voyage to voyage as the centre of gravity shifts with the loading of the vessel. Whereas damage stability in dry cargo or passengers ship will remain more or less predictable from one voyage to the next.

Consequently, the loading conditions verified for damage stability compliance at build for a chemical tanker may not include the worst operational condition that occurs in service. Damage stability for dry cargo and passenger ships is assessed differently, on the worst possible case of damage, which is readily predictable and ensures a



The IMO regulation governing damage stability in ships.

SG	#1	#2	#3	#4	#5	#6	#7	#8	#9	Slop	Lk	GM	Margin Damaged
0.630	100	100	100	100	100	100	100	100	100	100	100	1.479	0.078
0.740	100	100	100	100	100	100	100	100	100	100	-	1.326	0.016
0.835	100	100	100	100	100	100	100	100	100	100	-	1.359	0.030
0.850	87	100	100	100	100	100	100	100	100	100	-	1.367	0.042
1.180	88	100	25	100	10	100	10	100	100	100	-	1.299	0.053
1.400	66	100	44	-	100	-	100	24	100	100	-	1.423	0.239
1.530	50	100	37	-	100	-	100	-	100	100	-	1.439	0.284
1.830	50	50	50	30	50	31	50	50	50	-	-	1.713	0.171
1.830	70	50	50	-	50	-	100	-	92	-	-	1.488	0.162
1.900	50	50	50	15	50	30	50	50	50	-	-	1.365	0.005
1.900	83	-	80	-	67	-	80	-	85	-	-	1.348	0.006

Typical cargo distributions, for a vessel departing from port. The table shows the vessel is not at its marks at SG0.63 or SG0.74.

margin over the minimum statutory criteria as loadings vary from one voyage to the next.

In an effort to determine how widespread the failure to meet damage stability regulations is the MCA is coordinating a survey of vessels calling at some European ports. After inspecting more than 70 ships the MCA found that around 45% of chemical

and product tankers were either not in compliance or were unaware whether the vessel had met the damage stability rules or not before leaving port.

Furthermore, many operators believed that if the vessel was loaded using the loading computers for intact stability, that this would be sufficient for the vessel to meet damage stability rules. The MCA, however, says this is

not the case and it is now applying to the IMO to develop common guidelines to ensure operators can show that their vessel meets damage stability rules before it is allowed to set sail.

In January the MCA intends to take its evidence on the compliance of tankers with damage stability regulations to the IMO in an effort to make certain that rules are applied consistently and that owners can show port state control that their vessel meets damage stability regulations.

### Four options for operators

There are four possible options for the operator to demonstrate compliance with damage stability:

1. to load the vessel only in accordance with fixed loading conditions from the approved Stability Information Booklet, as these have also been approved for damage;
2. where there is a *significant variation* from the fixed loading conditions in the approved Stability Information Booklet, the operator must obtain approval from the Administration, or a Recognized Organization acting on its behalf, for the proposed loading condition;
3. to load the vessel in accordance with an envelope limiting KG (or GM) curve, possibly supported by tank filling requirements, which had been developed in accordance with the relevant damage stability provisions. This curve is checked by an intact stability instrument; or
4. to use an approved Stability Program to check that all loading conditions comply with damage as well as intact stability.

Expectations within the MCA are that its view will be challenged by owners because some operators are concerned that any new requirements placed upon them to make certain that their ships meet damage stability rules could be commercially damaging.

However, the MCA's assistant director: seafarers and ships Paul Coley said: "It is not acceptable for tank vessels to employ alternate loading conditions without any means to verify that these comply with damage stability requirements. To satisfy flag and port state inspection, operators of tank vessels must ensure crews can produce auditable records to demonstrate that damage stability has been verified."

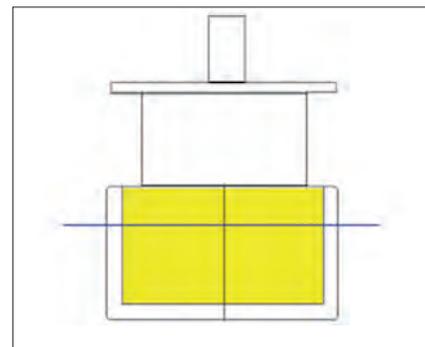
Particularly vociferous in the putting the owner's view has been the International Parcel Tanker Association (IPTA) which could yet see the MCA's proposals thrown out.

The debate in January will be the culmination of a number of past discussions at the IMO's Maritime Safety Committee (MSC) 82 and the Stability Loadline and Fishing (SLF) vessels sub-committee.

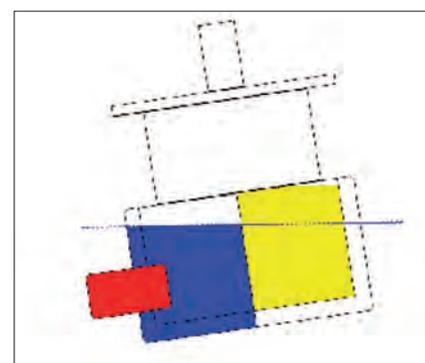
Mr Coley of the MCA representing the UK at IMO said: "The UK strongly recommends the provision of damage stability programmes for this purpose [to ensure compliance with damage stability rules] on any vessel where adherence to the approved conditions is not practicable."

IPTA group manager Janet Strobe, however, argues: "We are concerned that to insist on PSC requiring vessels to demonstrate compliance with damage stability requirements before leaving port will inevitably lead to vessel delays. Why? Because, as the MCA has conceded all along, the only way practical way to do this is by use of a damage stability computer.

"If the vessel does not have such a computer (which is the case with a large number of vessels) then the administration would have to be called in. This would naturally take time and lead to delays for vessels, and not necessarily because the vessel is not in compliance with damage stability requirements, but simply because it



Cross section of tanker loaded with low specific gravity cargo.



Ship heels toward damage.

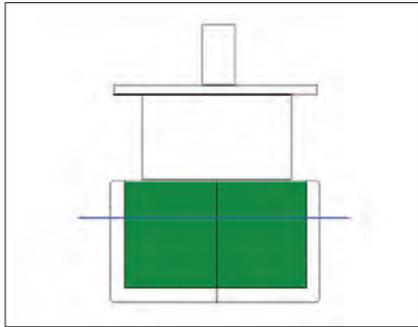
does not have on board a piece of equipment which is not mandatory."

The MCA believes this argument to be spurious with the cost of buying a computer and damage stability programme along with the requisite training coming at under £10,000 a ship the MCA considers this a very small price to pay for ensuring that a ship remains stable following an accident.

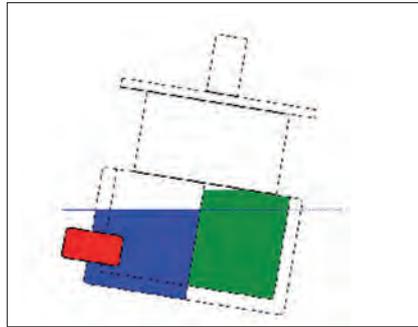
IPTA further argued that: "due to their high degree of subdivision, chemical tankers normally have high margins of damage stability".

According to the MCA this view is dangerously complacent and factually erroneous. "We've already had a near miss with a vessel called the *Ece* which sank with a hole that was only around 5m wide," following a collision close to the Channel Islands, said Mr Coley.

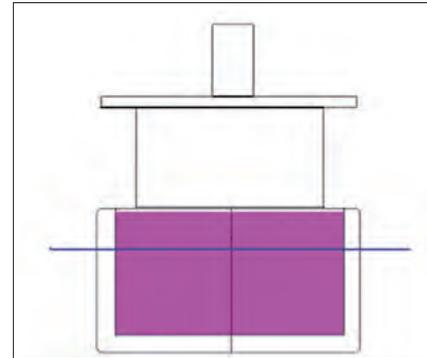
That ship was not at the time carrying a hazardous pollutant and there was no danger to marine wildlife. However, he added: "We're not saying that the *Ece* was not compliant, but how many ships are out there carrying noxious



Loaded with high specific gravity cargo.



Ship heels away from damage.



Full tanks.

substances onboard which could be vulnerable to a minor damage, that was a warning to the industry. We are not suggesting that more regulations are necessary, only that the present ones should be complied with”.

For their part IPTA say that this was a verbal submission at the IMO that was misquoted and that they will raise the issue at the next meeting in January. IPTA says that its representative actually said: “Due to their high degree of subdivision, chemical tankers normally have high margins of stability”.

“We are concerned that to insist on PSC requiring vessels to demonstrate compliance with damage stability requirements before leaving port will inevitably lead to vessel delays”

Neither is Mr Coley convinced by IPTA’s view that: “There is widespread understanding within the industry that damage stability issues are dealt with at the design stage prior to the issuing of Certificates of Fitness”.

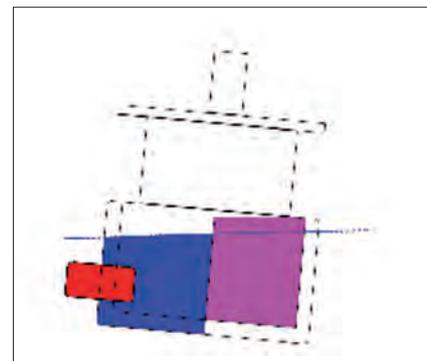
Within the MCA this view is seen as an attempt to divert the requirements made on owners and operators to use ships appropriately from themselves and onto the designers. “Some people in the industry are shifting the responsibility for designing ships to be inherently safe onto the naval architects, but it is the operators that must load the ships in the appropriate manner and in accordance with the vessel’s approved loading manual,” said Mr Coley.

The UK’s view is supported at the IMO by the flag states of Germany, Denmark, Norway and Sweden and industry organisation Intertanko. In fact Germany already has requirements that are more stringent than the UK’s on this issue. Even so the compliance of chemical tankers was not seen as a pressing issue by IPTA.

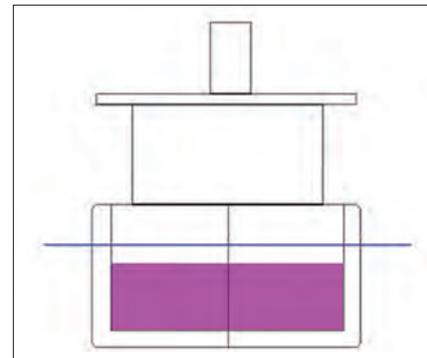
In the first instance the IPTA asked to see evidence from the MCA and the other flag states that showed that these changes were necessary. This led to a questionnaire sent out in 2005 that showed similar results to inspections completed on more than 70 vessels that called at UK and European ports.

Janet Strode said: “our concern is that allegations have been made about the safety of the tanker fleet with no justification in the form of data or records having been provided. Our position from the outset on this issue has been that we - and indeed the relevant IMO committees - can only make sensible judgments on this on the basis of factual evidence.”

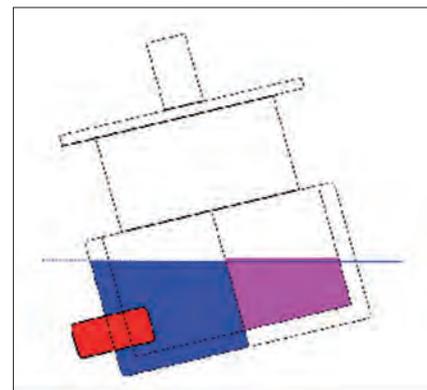
This resulted in inspections, conducted in 2009, through which the MCA discovered that around 45%



Heels away after damage.



Slack tanks.



Heels towards damage.

of chemical and product tankers that entered UK and European ports did not meet damage stability regulations. These findings will be presented to the SLF meeting in January by the MCA.

In addition it transpired that masters believed that by using the intact stability and loading programmes on computers this would be sufficient to meet the requirements of the damage stability regulations too.

In fact, as Mr Coley, explains the

“Some people in the industry are shifting the responsibility for designing ships to be inherently safe onto the naval architects, but it is the operators that must load the ships in the appropriate manner and in accordance with the vessel’s loading manual”

behaviour of a damaged chemical or product tanker can be very different and in some cases quite unpredictable, depending on the combination of chemicals and their specific gravity that are being transported at any one time.

Effectively the behaviour of a damaged chemical tanker, unlike other vessel types that are more predictable, can vary widely. For example if a chemical tanker is loaded with cargo that has a higher specific gravity than water then when the damaged tanks lose their cargo and that is replaced by the lighter seawater then the ship will



The chemical tanker *Ece* sank in the channel following a collision that caused a small amount of damage. Fortunately the vessel was loaded with a non-stick cargo.

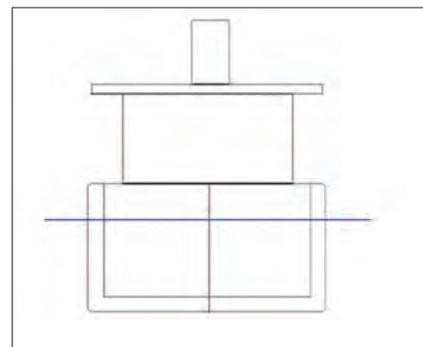
list away from the side that is damaged. However, if the chemicals have a lower specific gravity than seawater then the weight of the water will cause the vessel to list towards the damage.

These effects can, in some cases, cause a vessel to sink more readily with a minimum of damage with the potential to cause devastating environmental damage depending on the cargo onboard. However, with proper loading the risks can be minimised.

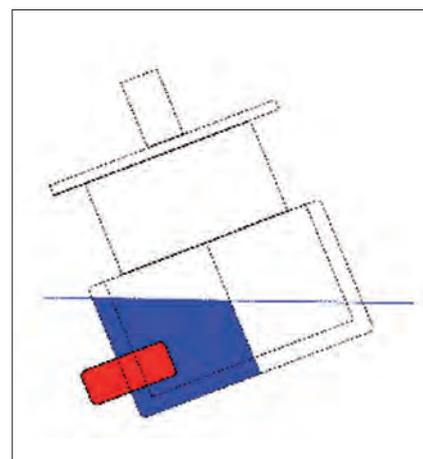
“Fortunately, the accident rate of chemical tankers is already very low, probably because of the high risk of these vessels and that they are usually run by a well trained crew, so they’re not often involved in groundings or collisions,” explained Mr Coley.

He continued to say that the point is that if these ships were to have a “relatively minor dink” they should not sink and a major pollution incident should be avoided.

“We have had a warning when the chemical tanker *Ece* was in collision with another vessel near the Channel Islands, the ship listed heavily and then suddenly turned over and sank,” said Mr Coley. “It was a near miss that had the potential to be a disaster through what was a comparatively small amount of damage. We have a chance to act now and avoid an environmental disaster in the future”.



Empty tanks.



Severe heel toward damage.

Even the MCA’s detractors believe that the probability of an accident remains low and to rush through enforcement rules that could affect the ability of some vessels to trade may well prove to be a mistake. **NA**

# A-Rosa Aqua graces the waters

*A-Rosa Aqua* the thirteenth river ship by Neptun Werft has been launched and marks another development in the A-Rosa cruise ship concept.

Joining the A-Rosa fleet in August this year *A-Rosa Aqua* has taken a step further in the development of river cruise vessels as it is the longest in the fleet.

*A-Rosa Aqua* is 135m in length with a width of 11.40m and is capable of accommodating 202 passengers. The vessel is powered by four Volvo-Penta diesel engines type D 12-450 MH(KC), with an output of 331kW at 1800rpm.

The engines are equipped with electronically controlled injection pumps and an electronic engine management system. Due to special charging the engines feature a high reserve or torque, making them more suitable for the propulsion of rudder propellers. The vessel has Schottel STP 200 three-blade double propellers, for propulsion.

Two elastically mounted Volvo-Penta three-phase power supply units are installed, each having an output of approx. 525kVA at 1500rpm. Fully automated parallel operation of the units is implemented by electrical



*A-Rosa Aqua.*



*A-Rosa Aqua* will sail on the Rhine.

## TECHNICAL PARTICULARS

### *A-Rosa Aqua* & *A-Rosa Viva*

Shipping line .....	A-ROSA Flussschiff GmbH
Dockyard.....	Neptun Werft GmbH, Rostock-Warnemünde
Year of construction.....	2009 (A-ROSA AQUA), 2010 (A-ROSA VIVA)
Length.....	135.00m
Breadth.....	11.40m
Draught.....	1.60m
Height above waterline.....	6.10m
Carrying capacity given draught = 1.50m .....	185tonnes
Passenger cabins .....	99
Number of cabins.....	202
Crew cabins.....	32
Crew compliment .....	59
Propulsion .....	4 x 331kW
Speed .....	more than 22km/h

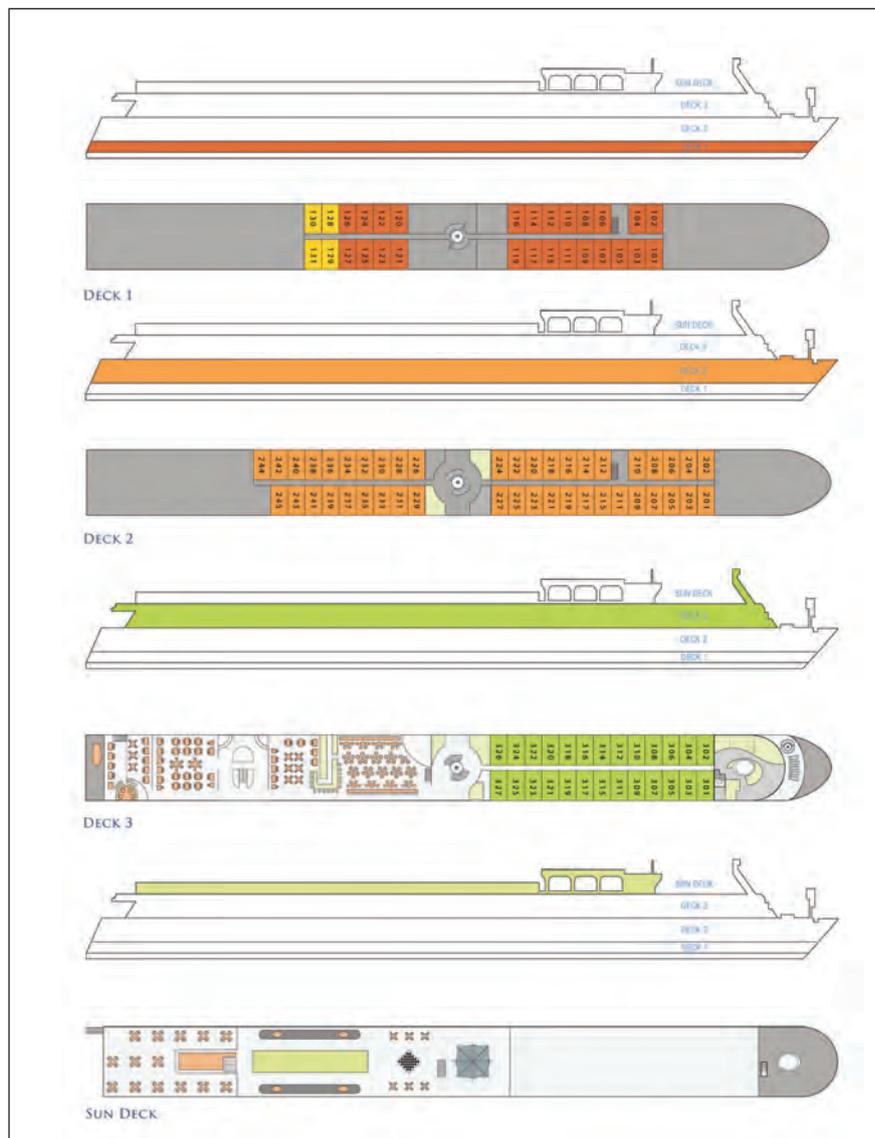
governors. The power supply units delivered by Paap & Sohn comprise diesel engines type D16 MG(KG)/HCM 534 F as well as Stanford generators. Also, a Volvo-Penta harbour diesel engine/emergency power supply unit type D 9 MG(KC)/HCM 434 F, with an output of 280kVA@1500rpm is installed on *A-Rosa Aqua*.

The bow thrusters installed on *A-Rosa Aqua* is a schottel pumpjet SP J 82 RD with an output of approx. 405kW and a thrust of more than 27kN. The vessel also utilises a Volvo-Penta motor type D 16-550 MH(KC) as an independent propulsion system.

A-Rosa has said that the ship that has now been delivered presents



The bar and lounge area of the A-Rosa Aqua.



a consistent continuation of the distinctive A-Rosa cruise ship concept. *A-Rosa Aqua* reflects the A-Rosa style throughout its design that passengers will be familiar with.

The redesign of the public rooms has permitted a freer use of these rooms either day or night time, with additional spaces being opened for live cooking areas.

*A-Rosa Aqua* will operate on the Rhine from/to Cologne in a series of five- and eight-day excursions travelling north and south through Germany, the Netherlands, Switzerland, France and Belgium, the design and the construction of the vessel complies with the latest passenger ship rules and regulations including stability rules.

*A Rosa Aqua* was delivered in August this year 2010 will also see the newest addition to A-Rosa fleet, the *A-Rosa Viva*, both vessels are to be constructed at Neptun Werft in Warnemünde with *A Rosa Viva* joining one fleet in 2010. A-Rosa will have a total of eight vessels in its fleet, four of which will sail on the Danube, two on the Rhone/Saone and two on the Rhine. **NA**

Deck plan of A-Rosa Aqua.

# MARINE RENEWABLE & OFFSHORE WIND ENERGY

21 - 22 April 2010, RINA HQ, London

First Notice & Call for Papers



Marine and offshore wind energy offers the potential to meet a small but significant share of the world's renewable energy aspirations. However, the maritime environment also provides many challenges in terms of economics, survivability and reliability of such systems. Offshore wind energy had made the most rapid progress and is now starting to move into large scale commercial developments. Wave energy developments have only seen sporadic progress since the 1970's. Tidal and current stream technologies, which began serious development in the 1990's, are now at the prototype and small scale commercial development stage.

Marine renewable and offshore wind energy projects involve a wide range of disciplines and expertise. This conference will bring together the industry stakeholders to provide a forum for discussion and a means of professional development for those involved with using natural marine resources to generate energy.

The conference will cover a wide range of topics:

- Research, development and testing.
- Design and construction of renewable energy systems.
- Installation, maintenance and subsea operations.
- Transport / lift vessels and associated support infrastructure.
- Project management and integration.
- Economics and viability.
- Marine planning, environmental protection, sustainable development.
- Regulations, licensing and future directions for development.



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## MacGregor to equip seven ro-ro's

Macgregor has recently announced that it has secured contracts with the German shipyard Flensburger Schiffbau Gesellschaft (FSG) for seven shortsea ro-ro's.

The contract will see MacGregor design, produce and supply 1000 tonnes of cargo access equipment for the ro-ro's that are to be delivered to UK-based Seatruck Ferries and three freight-ferries for Ulusoy Sealines, Turkey.

Seatruck's four newbuildings will each have a shipset that will include; a straight cylinder operated stern ramp, a side-hinged ramp cover, two guillotine-type pilot doors and a hydraulic power pack. The delivery and installation is planned for between 2011 and 2013.

Shortsea ro-ro vessel delivered from FGS earlier, equipped with MacGregor ro-ro access equipment.



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# Yangtze River sees China's largest cruise ship

Victoria Cruises has launched its latest and biggest ship of its fleet *Victoria Jenna* that will cruise on the Yangtze River.

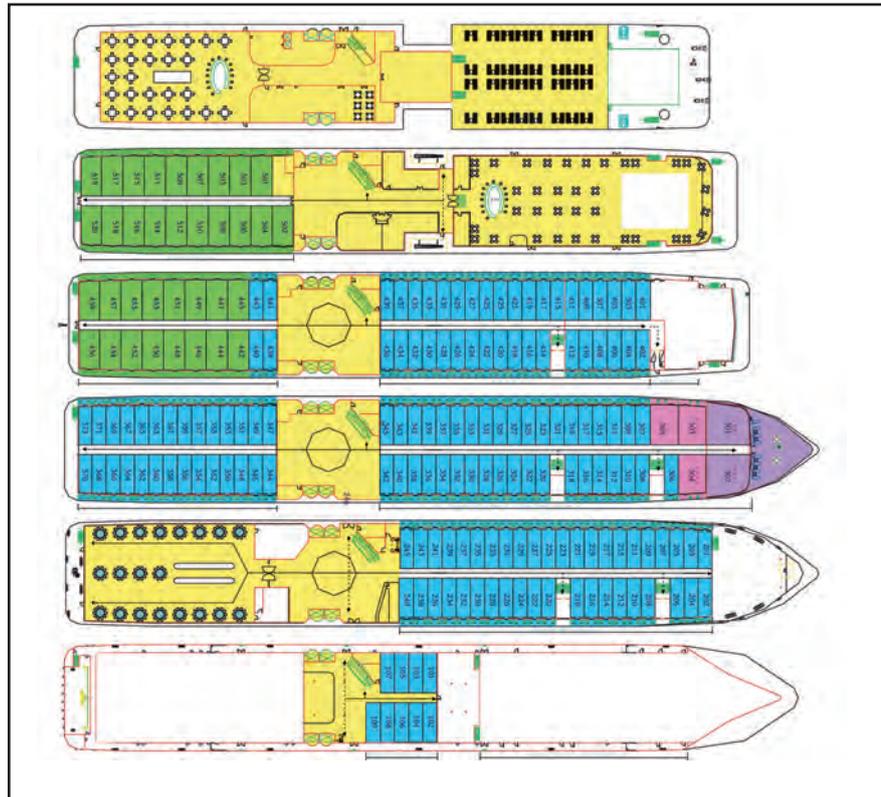
Victoria Cruises has a fleet of eight vessels including the recently launched *Victoria Jenna*. The completion of the *Jenna* has been planned for several years say Victoria Cruises, with one sailing every day in each direction upstream and down stream, plus one sailing a week from Chongqing to Shanghai and vice versa.

The *Victoria Jenna* will sail exclusively on the Yangtze River and will be the largest ship in Victoria Cruises' fleet, measuring at 133.8m in length and 18.8m in width. It will be capable of carrying 400 passengers up and down the Yangtze River.

"The vessel was built at Chongqing Dongfang Shipyard and has provided many firsts for Victoria Cruises," says Larry Greenman, manager public relations & customer service at Victoria Cruises. It is the largest river cruise vessel on Yangtze River by length, width, tonnage and passenger count.

The vessel will also be the first river cruise ship on the Yangtze River with four elevators, two full service separated kitchens, full bath tubs and wireless CDMA internet.

The vessel also uses advanced sonar, GPS, engine and Navigation systems to ensure maximum safety. Looking after the



Deck plan of *Victoria Jenna*.

environment is also a concern onboard the vessel with paper usage cut down by streamlined onboard software, double water filtration, dual flush toilets and energy saving light bulbs.

*Victoria Jenna* will be sailing on Victoria Cruises four and five day itinerary to the Three Gorges, both up stream and downstream between Chongqing and Yichang. **NA**

*Victoria Jenna* cruises down the Yangtze.



TECHNICAL PARTICULARS	
<i>Victoria Jenna</i>	
Year built .....	2009
Gross Tonnage .....	10,000tonnes
Length.....	133.8m
Beam/Width.....	18.8m
Draft .....	2.6m
Speed .....	26km/h
Passenger Decks .....	5
Crew.....	180
Standard Cabins.....	149
Executive Suites .....	35
Deluxe Suites .....	3
Shangri-La Suites.....	2
Total Cabins .....	189
Total Passengers .....	378

# Viking strikes again

Viking Cruises launches its largest passenger vessel to date *Viking Legend*.

**V**iking Cruises has added *Viking Legend* to its fleet and it is now the company's largest and greenest vessel as it operates on a diesel electric propulsion system.

*Viking Legend* is 135m in length with a width of 11.4m, and can accommodate 189 passengers and 50 crew. The vessel will be sailing on the rivers of Europe, with its maiden voyage having started in Amsterdam, The Netherlands.

Vacon was commissioned for the job of supplying and installing the AC drives on *Viking Legend*, which sees the world's first river cruise vessel featuring a diesel-electric propulsion system.

The diesel electric propulsion system of the vessel makes the manoeuvrability of the 135m vessel easier on narrow rivers. It is estimated that the vessel will achieve a 20% boost in fuel efficiency in comparison to any other river cruising vessel in the region says the company. The ship will also provide a quieter ride for guests by using four smaller propellers

instead of two large propellers. Moreover, both engine rooms have been insulated to further reduce noise and vibration.

*Viking Legend* is equipped with an integrated propulsion and network system, based solely on inverter-driven asynchronous generators and propulsion motors. The system uses Vacon's variable-speed AC drives, and asynchronous generators and motors by AEM, Germany.

"*Viking Legend* provides several new and remarkable technical performance features which will not only significantly reduce fuel consumption and CO<sub>2</sub> and NO<sub>x</sub> emissions, but will also improve the manoeuvrability of the vessel and minimise cost and maintenance. We are very excited that our technology is part of the world's first diesel-electric river cruise vessel, which is one of the largest river cruise vessels in Europe," says Heikki Hiltunen, executive vice president, Vacon Group.

The integrated diesel electric network and propulsion system was developed and delivered by German-based e-powered

marine solutions GmbH & Co. KG (e-ms).

"The innovative network and propulsion topology of e-ms is based on the cutting edge inverter technology from Vacon. It will now offer new and interesting opportunities for the marine and offshore industry. Thanks to the technically excellent, efficient and comprehensive support from Vacon's engineers and my own team's performance, it was possible to materialise this project within the given time frame," says Peter Andersen, managing director, e-ms.

The Main propulsion system consists of four electrically-driven Schottel rudder propellers. The required electrical power for propulsion system and ship's network is provided by three diesel generator-sets. These are dimensioned in a way (2 x 1000kW, 1 x 560kW) that sufficient power for the network and propulsion drives of the *Viking Legend* will mostly be provided by two diesel generator-sets only. However, the vessel also has the option of operating on one diesel generator-set. [NA](#)

*Viking Legend* sails out with its diesel-electric propulsion system.



# The Royal Institution of Naval Architects

## SHIP DESIGN AND OPERATION FOR ENVIRONMENTAL SUSTAINABILITY



10 - 11 March 2010, London, UK

First Notice & Call for Papers

As Mr. Mitropoulos the Secretary General of IMO has stated it is now generally accepted that *"The time for apportioning blame as to who is responsible for the state of the planet has passed. Now it is time for action. Developed and developing countries, industrialized and emerging economies alike are left with no option other than to get together and, together, work out solutions that will serve well the good cause of reversing the route to planet destruction."*

The environment must be considered in every aspect of the design and operation of all shipping, from construction all the way through to decommissioning. The earlier these issues are addressed in the design stage, the more cost effective and successful they are likely to be at reducing the environmental impact of shipping industry. However, much can also be undertaken on existing vessels to reduce the impact of the remainder of their lives. The IMO is systematically introducing regulations on a number of topics to reduce the impact of the marine industry on both the sea and atmosphere, including exhaust emissions, anti-fouling, and ballast water amongst others.

RINA invites papers from designers, regulators, class societies, builders, owners, suppliers and researchers on all related topics including:

- Lower fuel consumption
- Reducing air pollution (CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub> and particulates)
- Ballast water treatment & management
- Waste management & sewage
- Reducing accidental spillage and discharges
- Minimising impact on maritime flora and fauna
- Improving ship energy efficiency index
- "Clean" production and maintenance methods
- Design for end of life & recycling
- Road map of upcoming and future legislation

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# German inland waterways set to expand in 2010

Even though the economic climate has put most luxuries such as holidays on the back-burner, the German inland passenger vessel market remains strong.

Whilst other areas in the German shipbuilding industry have suffered a blow from the economic downturn, newbuilds in the inland vessel sector look to be holding steady.

The Building of inland waterway vessels in Germany 2004-2008, reports that in 2008 the inland vessel shipbuilding sector had a turn over of €150million, which was twice as much as 2006 and €25million more than 2007.

Christian Schilling, of the German Shipbuilding and Ocean Industries Association, comments on the German market's growth: "It is growing! As we can see from the figures [see the report: 2008 Building of inland waterway vessels in Germany 2004 – 2008]".

The Growth of the German inland shipping industry has mainly been in the passenger/daytrip/river cruise vessels, which in turn is followed by harbour tugs and freight vessels.

"We see growth in mainly the passenger vessel sector, which is probably the most expensive area for the industry, but probably why it is still good in this area," says Mr Schilling.

He adds: "From the figures, we see that 2009 should generate or hold steady with 2008's figures for newbuilds."

Further development in the inland vessel sector has seen more ships enter service on rivers such as the Rhine and Danube this year.

This year AMA waterways announced that it had launched two more vessels adding to its fleet of vessels, *Amadolce* and *Amalyra* which will operate on the Rhine. Also, German-based A-Rosa has launched two further vessels this year, *A-Rosa Aqua* and *A-Rosa Viva*, designed to further expand the A-Rosa fleet.

Last year saw Alster Lake in Hamburg get a 'green' touch to passenger shipping



The *Alsterwasser* was launched September last year with latest fuel cell technology onboard. (Credit: SSB Oortkaten shipyard)



*A-Rosa Aqua* sails past *Celebrity Equinox*. (Credit: Meyer Neptun and Meyer Werft)

with the latest development from fuel cell technology, which was installed on Zemships 'Zero-emission' passenger ship the *Alsterwasser* (see *Naval Architect*, Nov 08, pg 56).

*Alsterwasser* was delivered September last year and is the first vessel of this type to operate on the Alster Lake. The *Alsterwasser* was constructed at SSB Oortkaten Shipyard and is operated by ATG Alstertouristik, who drafted the designs for the vessel.

The fuel cell hybrid technology in the vessel was designed by Proton Motor Fuel Cell GmbH. Felix Heidelberg, chief

technology officer, Proton Motor said at the time of delivery of *Alsterwasser*: The FCS *Alsterwasser*, which is twice as efficient as a common ship with a diesel combustion system, is a prime example for innovation we are certainly very proud of it. It demonstrates very well that tomorrow's technology can already be applied for every day life today."

Also, expected in the coming future will be a further three newbuildings with three options being constructed at Volkswerft Stralshund Shipyard to be delivered in 2010-2012. [NA](#)

# Transferium adds to efficiency of inland waterways

Container crane barge *Transferium* is set to enhance the efficiency of transport logistics in Holland, by further reducing the transport of goods by road and, thereby, reducing CO<sub>2</sub> emissions.

**T**ransferium will complement Mercurius Shipping Group's first crane barge *Mercurius Amsterdam* that was launched in 2006. The initial idea behind the launch of *Mercurius Amsterdam* was to relieve roads around Amsterdam from congestion by reducing truck transport, by "providing a daily milk run to companies located on the waterfront in the area of Amsterdam with the crane barge," says Robert-Jan Zimmerman, CEO of Mercurius Shipping Group (MSG).

In its first two years of operation the *Mercurius Amsterdam* had difficulty in attracting customers. "Convincing logistics managers to change their transport operations from road [a flexible transport option] to sea [a not so flexible option] was difficult," said Mr Zimmerman.



*Transferium*, before the fitting of its Liebherr crane, looks to ease congestion of Amsterdam roads.

## TECHNICAL PARTICULARS

### *Transferium*

Length.....	97m
Breadth.....	11.55m
Depth.....	4.25m
Maximum draught.....	3.50m
Maximum tonnage .....	2200tonnes
Propulsion .....	2 x ABC 6MDZC 800rpm 1.103kW
Crane.....	Liebherr (360deg rotary liefronic crane)
Lifting power.....	45tonnes on 24m/ 40tonnes on 28m
Number of crane movements .....	approx. 22 per hour
Anti-heeling.....	automatic anti-heeling system
Spreaders .....	automatic/ telescopic spreader with c.o.g compensation for 20'-30'-40' ISO containers
Operator.....	MTU Lucassen
Owner.....	Mercurius Shipping Group & Vof IJsselstad

He continued: "It took some time to convince logistics managers, but in areas of cost we can work out cheaper for them; that is to say in total cost not just transport. Also, with the crane barge we offer one point of contact for the customers goods, where as with road logistics you can have lots of different drivers and lorry's carrying your goods."

With work coming in for *Mercurius Amsterdam* between Rotterdam and Amsterdam, MSG commissioned *Transferium* to be designed and built at Serbian Shipyard Begej; which MSG bought in 2007 after having worked on the construction of vessels for MSG.

*Transferium* offers an improved design of the *Mercurius Amsterdam* by being 10m longer in length and using Dutch-based ABC engines. Unlike the *Mercurius Amsterdam* that had two engines for power and generation, the *Transferium* utilises two engines for power and two separate engines for power generation.

The vessel is 97m in length with a breadth of 11.25m and a depth of 4.25m and is powered by two ABC 6MDZC 800rpm 1103kW engines. With the enhanced power the *Transferium* is capable of pushing three push barges, two more than *Mercurius Amsterdam*.

The hull form has been built to be strong enough to absorb the movements of the crane, added to this is the anti-heeling system which has two incorporated systems; one of which has two large weights of 40tonnes each located on the fore- and aftside of the crane on lorry's that can be pulled to starboard or portside within seconds. The second system operates four large 10inch cross-over waterpipes, each with a 4000m<sup>3</sup> pump, able to push water from side to side very fast.

Currently, *Transferium* is under going further testing after it recently fitted its Liebherr crane in coordination with its anti-heeling system and is due to commence operations at the end of October. **NA**

# AMA Waterways expands fleet with *Amadolce* and *Amalyra*.

As part of its on going expansion programme since its start in 2005, AMA waterways launches another two vessels for 2009.

As part of its on going expansion programme since its start in 2005, AMA waterways launches another two vessels for 2009.

The 148-passenger vessel *Amadolce* was christened earlier this year at a ceremony in Durnstein, Austria. A sister vessel *Amalyra* was delivered shortly before the *Amadolce*, with a christening ceremony in Vilshofen, Germany.

“The vessel is part of our on going expansion programme,” says Ana Figueroa, of AMA Waterways.

With the slowdown in the economic climate it may be considered brave to be expanding a fleet at this time. However, Ms Figueroa comments on the expansion of the AMA waterways fleet: “We plan all of

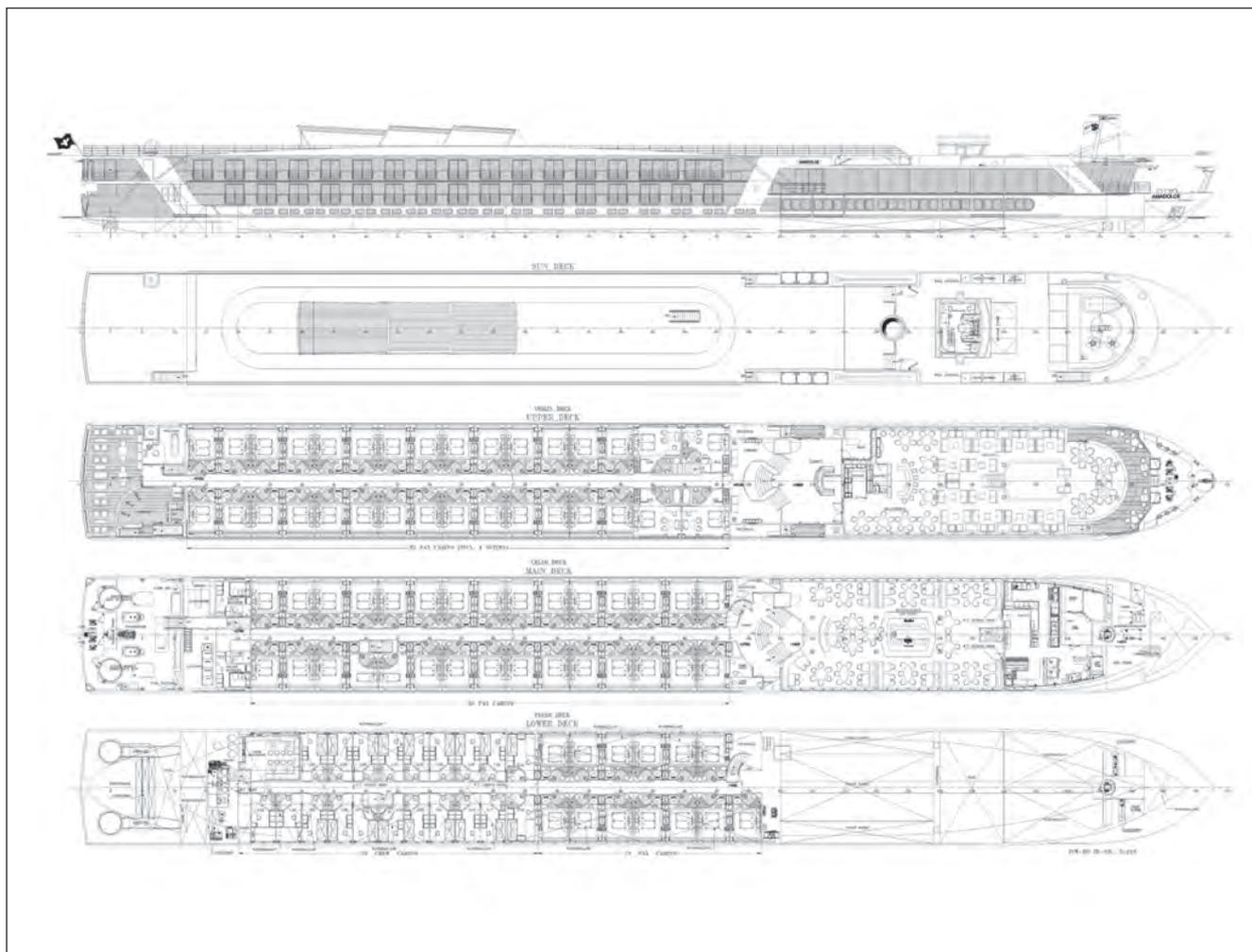
our ships a lot of time in advance, which is part of the expansion programme. We are also looking at our Macon River expansion programme as well and feel confident about 2010.”

The vessels were both constructed at Grave Shipyard in The Netherlands and are scheduled to sail on the Danube River.

*Amadolce* is 110m in length, with a breadth of 11.45m and uses Caterpillar type C-32 748kW at 1800rpm to power her, which is complimented by a Caterpillar type C-18 420kW at 1800rpm bowthruster. **NA**

TECHNICAL PARTICULARS	
<i>Amadolce</i>	
Length.....	110m
Beam.....	11,45m
Depth.....	2,75m
Draft (in ballast) .....	1,60m
Passengers.....	148 passengers

GA of *Amadolce*.



# The *W*orld Superyacht Awards

## Young Designer of the Year 2010

A prestigious award for talented young superyacht designers is to be awarded at the  
Boat International Media 2010 World Superyacht Awards

The Royal Institution of Naval Architects, the Boat International Media and Camper & Nicholsons International invite entries for the 2010 World Superyacht Young Designer Award competition.

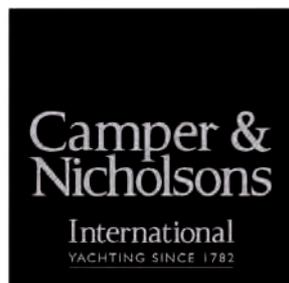
Introduced with great success in 2008, the World Superyacht Young Designer Award competition provides a showcase for young designers to demonstrate their ability and talents, and encourages the development of the next generation of superyacht designers.

The World Superyacht Young Designer Award will be presented to the winner of the competition at the World Superyacht Awards ceremony in May 2010, at which the remarkable ingenuity and innovation demanded in the design, engineering and construction of the world's finest luxury yachts is demonstrated, and is the most obvious place for new designer talent to be recognised and celebrated.

### The Competition

The competition is open to anyone who is studying for a degree or vocational qualification in a subject relating to yacht or small craft design, or anyone who has already graduated within three years of the closing date for entries, which is 31 January 2010.

The 2008 and 2009 competition saw many entries from all over the world, as far afield as NZ and China, as well as from all over Europe. RINA's CEO Trevor Blakeley is proud that RINA is continuing to support this award for young designers: 'The superyacht industry is one of the most successful sectors of the maritime industry, and owes much of that success to the work



of its designers who provide that unique combination of form and function, which is the modern superyacht.'

### The Award

The World Superyacht Young Designer Award will be presented to the young designer who produces the best concept design for a superyacht. The entries will be judged by a group of leading world-class designers selected by the Royal Institution of Naval Architects and Boat International Media. The winner of the Award will receive a prize of €5,000 and will be invited to receive the award at the renowned World Superyacht Awards ceremony.

### The sponsor

The Award is organised by the Royal Institution of Naval Architects and Boat International Media, and is sponsored by Camper and Nicholsons International: 'Following the joint Camper & Nicholsons International - Boat International initiative three years ago to reward the work of yacht

designers and naval architects, we thought it was only natural to continue to collaborate with the Boat International Media and RINA in order to identify the young designers of the future,' says Camper & Nicholsons International's CEO Jillian Montgomery. 'Taking an active part in this competition prepares the grounds for the future in many ways. Firstly, by giving up and coming designers exposure and the opportunity to get in touch with potential clients, and secondly by offering our existing and future clients a glimpse of designs that could soon be on the drawing boards,' explains Laurent Perignon, director of marketing for CNI.

The closing date for entries is 31 Jan 2010. If you are interested in submitting an entry or would like more information, contact Giuseppe Gigantesco, E-mail: [ggigantesco@rina.org.uk](mailto:ggigantesco@rina.org.uk), Tel: +44 (0)20 7235 4622

The Royal Institution of Naval Architects, 10 Upper Belgrave Street, London, SW1X 8BQ The rules for the competition can be viewed at [www.rina.org.uk/wsyaward](http://www.rina.org.uk/wsyaward)

# Rotterdam Rules 2009

On the 23 September it was announced that 16 countries had signed up to support the latest United Nations (UN) convention the Rotterdam Rules, at a signing ceremony in Rotterdam.

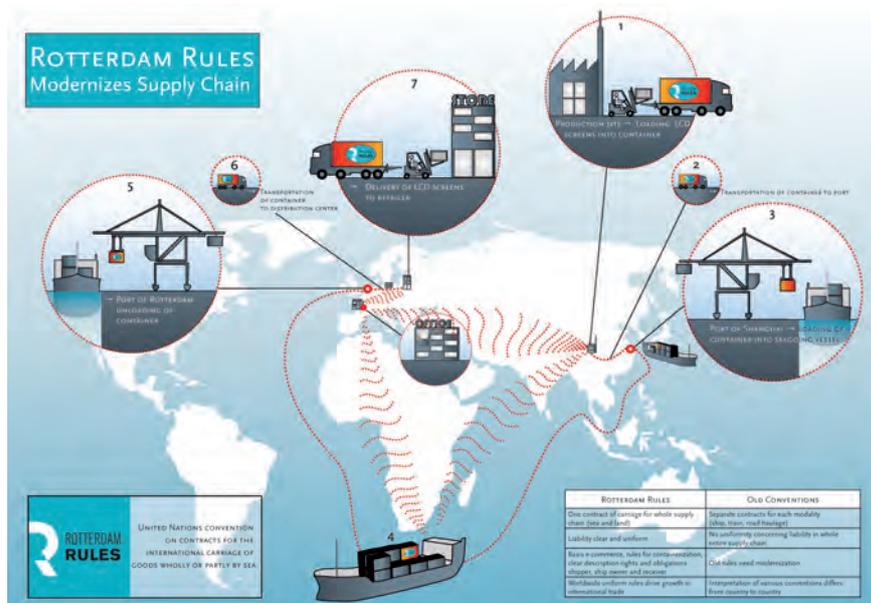
The Rotterdam Rules are the first rules that will govern the carriage of goods by sea (shortsea or inland) connecting areas previously served by land transport. These rules are a modernisation of maritime law and will replace the Hague Rules (1924), the Hague-Visby Rules and the Hamburg Rules (1978).

“The Rotterdam Rules are for the contracts of maritime carriers of goods and sets conditions in place, with contracts now including inland places,” says Mr van der Ziel, head of the Netherlands’ delegation to UNCITRAL.

The convention lay’s in place the rights and obligations involved in the carriage of goods in the maritime industry. The Rules are expected to bring more clarity for who is responsible and liable for what, when, where and to what extent when it comes to travelling by sea.

“The primary liability will still be with the maritime carrier, but if a sub-contractor is used then this can also mean liability is with them as well,” says Mr van der Ziel.

However, he points out that: “It doesn’t apply to all. It is only applicable to maritime sub-contractors that are assisting the vessel, for instance when loading and unloading. It excludes inland sub-contractors.”



The Rotterdam Rules will modernise the maritime inland transport industry.

The Rotterdam Rules needs 20 countries to ratify the convention to bring it in to force. To date, a further three countries have signed the convention, bringing the total up to 19 countries that have signed the convention, with further countries showing an interest in signing the convention.

Mr van der Ziel notes though: “That it is wise to point out that signing and ratifying a convention are two different actions.

That to ratify a convention would involve governments making legislation in their countries to enforce the convention. With the signing of the convention it still may take a couple of years to ratify.”

It is further hoped, however, that by adopting the Rules it will boost world trade conducted by sea by 80% and create a more efficient manner in which, contracts and documentation are handled. *NA*

The only way to be really sure ....



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## Marine Coatings 17 - 18 February 2010, London Second Notice

The marine environment has always been a harsh and unforgiving environment for both anti-fouling and corrosion control coatings systems. In the current economic climate the industry faces an even greater need to improve the performance and cost effectiveness of coatings systems. The industry is now being affected by more and more legislation on safety and environmental protection issues.

The ballast tank Performance Standards for Protective Coatings (PSPC) is now incorporated in SOLAS and standards for oil tank coatings are being finalized. These regulations also require the shipowners to maintain a Coating Technical Files (CTF) to record details of the coating system and its maintenance. This file will be subject to regular audit by Class.

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By Professor Chengi Kuo FRINA Ref: BFE01

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By Lisa C. Hix Ref: IDMYD

In a first-time release to industry and the general public, the Westlawn Institute of Marine Technology announced in April 2009 this textbook was now available for purchase. Specifically prepared as a textbook for Westlawn's intensive Yacht & Boat Design Program, and also used as the text for Westlawn's continuing education course in boat interior design this book provides detailed technical information not available from any other source. Heavily illustrated, with numerous line drawings and photos on nearly every page, this textbook will answer almost any question a designer, builder, surveyor, crewmember, or serious boater may have about the accommodations and arrangements required for safe, comfortable, and efficient crew and passenger spaces. Though focused on boats (vessels under 200 feet or 60 meters), the information is equally valuable for commercial vessels of all sizes.

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By Dr DA Taylor FRINA & Dr Alan ST Tang MRINA

Ref: MSNA

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By Michael Penny Ref: SO

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By V. Dubrovsky FRINA, A. Lyakhovitsky Ref: MHS

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By Maurice Cocker Ref: RNS

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By Professor Chengi Kuo FRINA Ref: SMMA

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By V. Dubrovsky FRINA Ref: SHWO

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By Anatoly Lyakhovitsky Ref: SWSS

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By Ian Buxton FRINA Ref: SHBS

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