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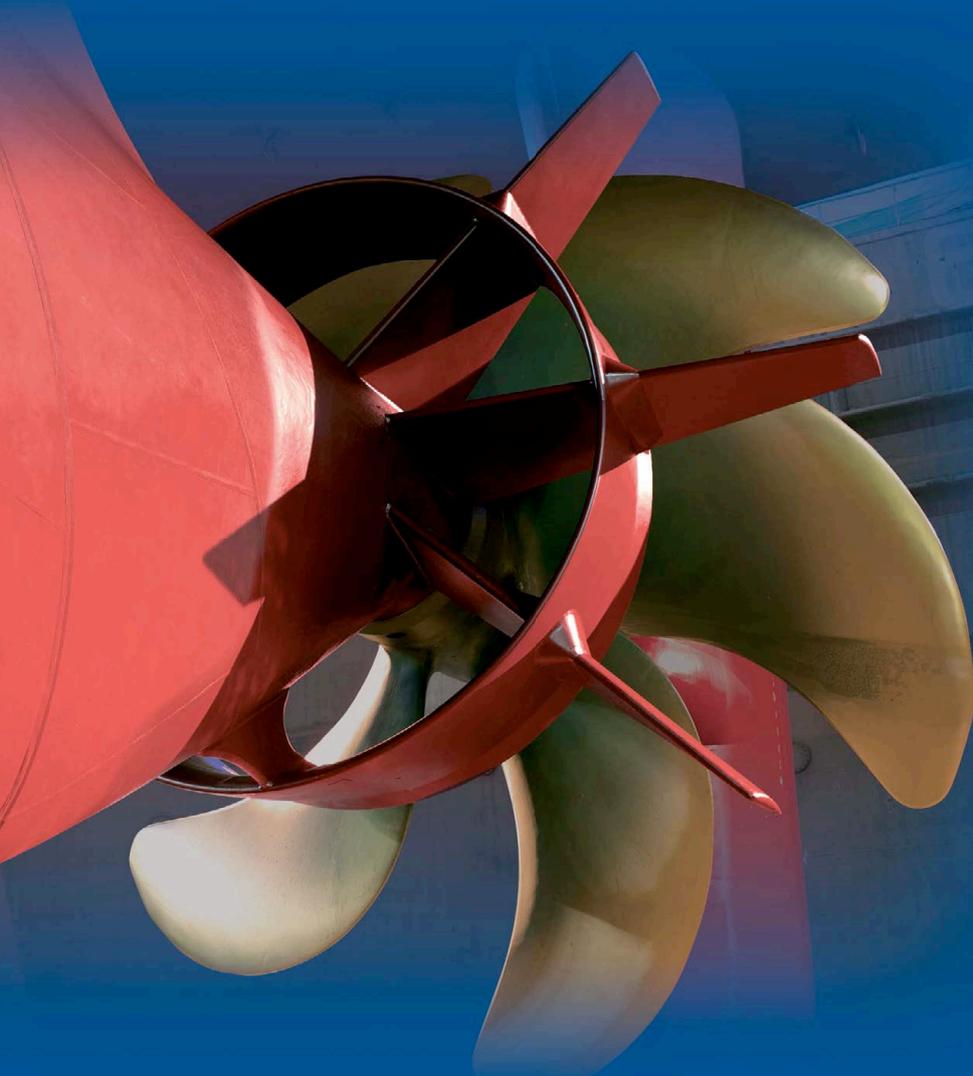
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Environmental legislation / Fast ferries / Cargo handling / China / Germany / **September 2013**



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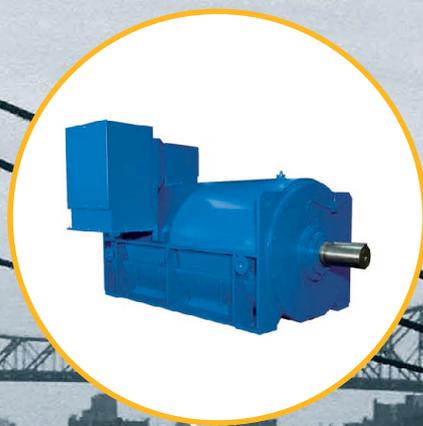
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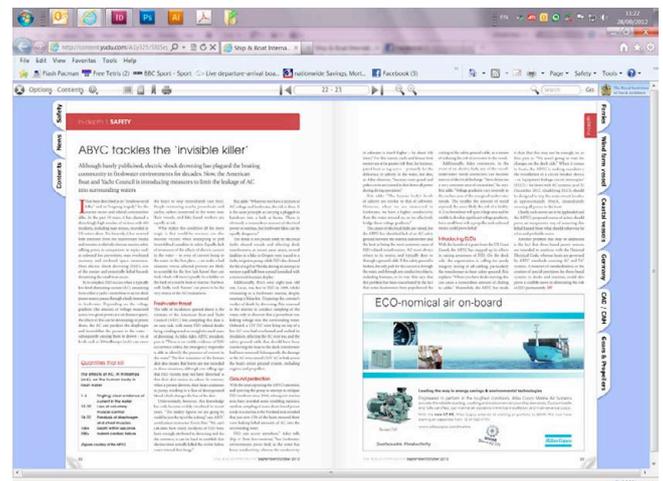
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Bolt from the blue

The mis-declaration of cargo weight or the type of cargo container in boxes appears to be the cause of a significant number of maritime accidents; it is time for the authorities to action to deal with this problem

It is unusual for an event to take place in commercial shipping that takes the entire industry by surprise. There are a few events that fall into this category, like the losses of *Titanic*, *Estonia*, *Pennsylvania* and most recently *MOL Comfort*.

Speculation surrounding the demise of *MOL Comfort* is widespread partly because the loss of the vessel has taken all in the industry by surprise. The latest news from the ClassNK Investigation Team is that the fault in the vessel's structure did not originate in the upper deck area or hatch coamings.

These initial findings increase the speculation that cracks in the ship originated within the vessel's double bottom. Further speculation regarding the necessary strength of the scantlings has been mooted. This speculation has been further fuelled by the strengthening of scantlings on the vessel's sisterships.

Perhaps one area of investigation that should not be overlooked in the loss of *MOL Comfort*, and *The Naval Architect* has no reason to believe that it is being overlooked, is the role that cargo owners play in some of these major accidents, particularly where containerships are concerned.

Pennsylvania is a case in point. The Centre of Documentation, Research and Experimentation on Accidental Water Pollution (CEDRE) reports: "According to the managing company Hanjin Shipping, the fire was understood to have started below deck and the fireworks were supposed to be carried on deck. The similarity of the explosions and fire onboard *Hanjin Pennsylvania* present a resemblance to accidents where a commodity known as calcium hypochlo-

rite has been identified as the main cause, like in the *CMA Djakarta* case."

In fact CEDRE believe that the original fire was started by calcium hypochlorite which was wrongly stored in the hold and spread to the fireworks which were also wrongly stowed in the hold. Two crew died in the *Hanjin Pennsylvania* accident and it bears similarities to both the *CMA Djakarta* and last year's accident on *MSC Flaminia*.

MOL Comfort did not suffer a fire, but rather a catastrophic failure of its structure. Nevertheless, all of these accidents appear to have one thing in common and that is the belief that cargo owners had mis-declared their cargo. In the cases where fire has broken out and calcium hypochlorite is the suspected cause P&I clubs suspect that shippers have 'renamed' the cargo.

In a report by the Steamship Mutual P&I Club the writer states: "During the investigations [into maritime accidents], many shipping companies restricted the carriage of calcium hypochlorite and as questions arose concerning the safety and classification of the chemical as a cargo, the variety of names under which the cargo was declared increased. These included: chloride of lime, lime chloride and hy-chlor, none of which appeared by name in the index to the IMDG Code."

Mis-declaration of cargo is not confined to dangerous goods, however, and this is where the failure on *MOL Comfort* comes into play. Often cargo owners will mis-declare the weight of cargo, that is, for cost purposes they claim that a container is significantly lighter than is actually the case.

The suspicion is that the Japanese vessel was carrying cargo that was significantly heavier than was declared by owners and this caused the crew to stow the containers in positions which caused significant stress on the structure of the vessel, causing it to crack and finally split in two and then sink.

Cargo that is heavier than declared by the shipper is a problem that shipping lines and maritime authorities have been aware of for many years and yet no system has been put in place to deal with the problem.

It is believed that, with the speed of operations paramount in the just-in-time logistics chain, cargo owners are reluctant to accept any system that would slow the carriage of the cargo down and shipowners and operators are not keen to disappoint their customers.

However, with lives at risk and the complex litigation that ensues following the loss of a container vessel, due to the number of cargo owners and, as in *Flaminia*, general average means that all cargo interests are liable for the loss of the vessel, it may be time to look at ways to address the problem of mis-declared cargo.

One way to deal with this problem would be to introduce a weigh station at every container terminal. Another solution would be to introduce a weighing mechanism on the gantry cranes and to have a system in place where mis-declared cargo weight will mean the container will not be loaded onto the vessel and there would be penalties for the cargo owner.

Such a system would not be difficult to introduce, would not slow cargo down significantly and would ensure the structural integrity and safety of vessels. *NA*

Newbuildings

Stat's reveal ongoing ordering decline

The decline in the orders of new vessels is brought into sharp focus by Clarksons statistics (see pages 66-67) which reveal that the peak for vessel deliveries was reached in 2010 and 2011, with 2,299 and 2,295 vessels delivered in these years respectively.

Since then the figures show a steady decline with 2,115 vessels delivered in 2012 and 1,814 projected for this year and only 1,604 slated for delivery next year. But, unless orders show a marked recovery then 2015 could well be the crunch for many yards with just 674 vessels currently due to be delivered.

Declines in the ordering of Capesize bulk carriers and VLCC's compared to these boom years is perhaps no surprise, but the continued ordering of very large container carriers, over 8,000TEU perhaps is surprising given the poor state of the market.

In other sectors, Panamax bulk carriers are still showing healthy ordering, while LNG carriers are showing significant growth while product tankers of between 30,000-60,000dwt are expected to show a significant increase in deliveries from 53 vessels last year to 87 this year and climbing to 137 next year.

Clarksons statistics overall show a patchy recovery with some sectors clearly fairing better than others, but the overall picture reveals that there is still a lot of work to be done in order for the shipbuilding industry to recover from its current difficult period. Perhaps further consolidation will mean that competition will be keener and that the yards themselves will be able to find enough work to maintain a viable business.

Engines

Danes in gas engine licence deal with DSME

Danish engine designer MAN Diesel & Turbo has signed a licence agreement with South Korean shipbuilder Daewoo Shipbuilding and Marine Engineering (DSME) to produce the yard's high pressure-fuelled gas supply (HP-FGS) system.

Under the terms of the contract MAN will use the HP-FGS system to power its LNG engines in commercial vessels. MAN currently supplies 80% of all marine two-stroke diesel engines and is also the only engine designer to produce a two-stroke LNG powered engine in the ME-GI.

According to DSME when the ME-GI engine was first introduced, around 10 years ago, the high pressure gas compressor system used as its fuel gas



DSME is to offer licences for its high pressure fuel gas supply system to be used with LNG powered engines

supply consumed a lot of power and occupied a large amount of space.

"The ME-GI engine had a hard time being commercialised in the marine field. But, the development of the high pressure pump-based FGS system by DSME is now contributing to the recent building of several LNG-fuelled ships with the radical improvement in the power and space efficiency," DSME claims.

DSME developed the HP-FGS in 2007 and currently holds the intellectual properties on the designs and integration tests of the ME-GI and HP-FGS have already been completed.

"In 2014, DSME will provide its FGS system to NASSCO which will build the world's first 3,100TEU LNG-powered containership owned by TOTE," the company revealed.

The TOTE containerships are currently being designed by DSME subsidiary, DSEC, and the new designs will include DSME's HP-FGS system and ME-GI dual fuel slow speed engine.

Newbuilds

HHI deliver ice class LNG carriers

George Prokopiou's Dynagas, the LNG transportation division of the company, has taken delivery of the first two 155,000m³ ice-class LNG tankers from South Korean shipyard Hyundai Heavy Industries (HHI).

Yenisei River and *Arctic Aurora*, were delivered in late July and are fitted with GTT designed MKIII containment system which was fitted using polyurethane glue.

Jose Navarro, Gas Technology Principal Specialist at Lloyd's Register says: "A key achievement was

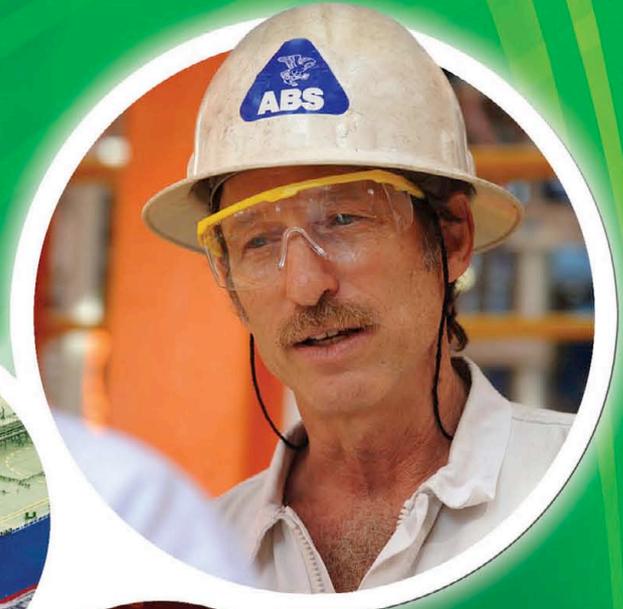
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implementing a fully automated bonding system for the cargo containment system's secondary barrier, which was achieved using polyurethane glue. In addition, the primary barrier has been reinforced with ribs and wedges to enhance its sloshing resistance."

The designs meet classification society Lloyd's Register's Ice Class and Winterisation rules and they have also been awarded the North Atlantic fatigue notation, ShipRight FDA, which continues for a 40-year period.

Four Wärtsilä-Hyundai dual fuel engines, operating on either LNG or diesel will power two propulsion motors which in turn will drive a single, fixed pitch, propeller. In addition the vessels have installed Lloyd's Register's trim optimisation system which will further improve the vessels' fuel efficiency.

Bridge layout and systems comply with rules allowing bridge operations to be supervised by a single member of staff and the bridge systems also comply with integrated bridge system requirements which allows for a centralised supervision of navigational controls.

Ship design

Tianjin uses Finnish PCTC designs

Wallenius Lines' order for two post Panamax pure car and truck carriers (PCTC), with two options, will be built at the Chinese yard, Tianjin Xingang Shipbuilding Heavy Industry (TXSHI).

The PCTC's are reportedly of a highly efficient design, in keeping with the owner's tradition of ordering environmentally friendly tonnage. Designs of the vessels will be carried out by the Finland based Deltamarin and they are expected to be around 200m in length with a 36.5m beam and to have a total capacity of around 8,000 cars.

Deltamarin says it has signed a contract with TXSHI "for approval and detail design work" on the vessels.

Before signing the contracts Deltamarin says it had already developed the outline and contract design with the shipyard for the Swedish owner.

"The vessels are designed to offer improved fuel efficiency and ensure low environmental impact. The hull is optimised for the lowest fuel consumption, excellent sea keeping and operability over a worldwide operational profile. Special fuel saving devices will also be applied to reduce fuel consumption," says the designer.

Deltamarin expects to complete the €3.5 million (US\$4.63 million) contract over the coming 12 months with work being conducted mainly at its European offices, while some of the detail design work will be carried out by its Chinese partner company, CSIC.

Past contracts between TXSHI and Deltamarin has seen the two companies develop a close working relationship; currently the yard is building 10 B Delta37 bulk carriers designed by the Finns, four for the French operator Louis Dreyfus Armateurs and six more for MT Maritime of the US.

Electric propulsion

Stadt to build on AHTSV order

Norwegian company Stadt expects to build on its latest order for electrical equipment on four AHTSV's, won against stiff competition from major companies such as ABB, GE Convertteam and Siemens.

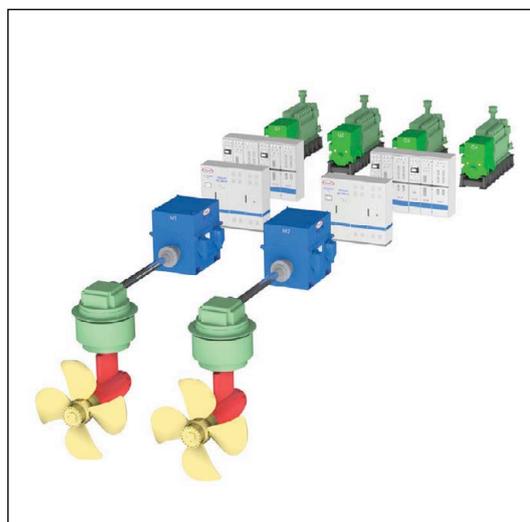
Stadt will provide electrical switchboards, drives and motors for the four vessels which are expected to be built in Nam Cheong's yards in Malaysia and China and will be delivered in late 2014 and early 2015.

The ships will have four gensets, provided by Japanese manufacturer Daihatsu which will drive two azimuth pods supplied by Rolls Royce. The 80tonne bollard pull AHTSV's will also have a DP2 positioning system.

Hallvard Slettevoll, a Stadt director, told *The Naval Architect*: "Nam Cheong chose us for technical reasons; we had a more efficient and more robust system and it is more compact."

He went on to say: "Our system will last three times longer than our main competitors, the lifetime of the Stadt system is 30 years and it is more reliable because we do not use capacitors in our system." [NA](#)

Plan of the drive for Nam Cheong's AHTSV designs



LNG Bunkering: GTT Solutions



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MOL prepares for Comfort reports

With results of the preliminary investigation into the *MOL Comfort* casualty set to be delivered early this month, the report's publication is bound to generate considerable industry interest, writes *Sandra Speares*.

Although it is tempting to speculate ahead of the findings about what could have caused such catastrophic hull failure, one plus point was that MOL has moved swiftly to reinforce the hulls of the *MOL Comfort's* sister ships and work on three of the six in the series has already been completed.

MOL said on 12 August that the company, with Lloyd's Register (LR), who it has appointed as technical consultant have conducted a thorough investigation into the causes of the hull fracture, which led to the 8,100TEU, 2008-built vessel breaking its back.

Measures taken to reinforce the hulls of *MOL Celebration*, *MOL Courage*, and *MOL Creation* were recently completed, and these vessels returned to Asia-North Europe service beginning 10 August.

The work done on the three containerships aimed to strengthen the hull structures to approximately twice that required by classification society ClassNK, which conforms to the safety standards of the International Association of Classification Societies.

ClassNK has confirmed that the work done on these three vessels was executed according to plan. Furthermore, LR expressed its opinion that the structural reinforcement completed for the vessels is considered to be the best preventive measure against a similar failure at present, MOL said.

MOL Charisma and *MOL Competence* are among three remaining sister vessels, which are already



Stern section of *MOL Comfort* getting towed

at the dockyards of Mitsubishi Heavy Industries, which built all the vessels, and their hull reinforcement will be completed by the end of September to the beginning of October. The work for *MOL Commitment*, which was only delivered this June will be completed by February 2014.

"MOL has extended and will extend all possible cooperation to the Committee on Large Container Ship Safety, which was launched by the Ministry of Land, Infrastructure, Transport and Tourism", the company said.

The Japanese ministry has launched a review of containership safety under the chairmanship of Yokohama National University professor Sumi Yoichi, with industry input from class societies, shipping companies, shipyards and research facilities. New safety guidelines are expected to be published by the end of this month.

MOL will receive the preliminary investigation this month to the *MOL Comfort* accident



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While LR and ClassNK have both declined to comment on the likely outcome of the investigation ahead of the preliminary survey findings, some industry observers suggest that a hidden defect, probably in the ship's double bottom led to a crack developing, which eventually led to the breakup of the ship.

Concerns have also been expressed at how such a hull failure could occur for a ship that was only five years old. Obviously, the fact that both bow and stern section have sunk means that the investigation will not have access of a lot of valuable information on what went wrong with the vessel.

Nautilus senior national secretary, Allan Graveson put his money firmly on the fact that it was a construction issue, and reflected current demands to reduce the weight of ships, "We have reduced scantlings to a minimum, cutting out steel by 40%" he said. He also pointed to the use of high tensile steel and a "prefabricated" building process.

He said he commended MOL's swift move to reinforce the ships, but said that the same issues were now reappearing that had once affected the bulk carrier sector. "We are going round again here. The builder, class and flag have some explaining to do". He also raised concerns about loading and discharging in ports, which had been a factor in the *Napoli* case. "We need to consider the stresses on the ship. There is something wrong with the international process. We are not engineering in a safety factor," he added.

Container weighing was another issue he highlighted from the safety perspective. Industry views have been split on the benefits of this.

MOL Comfort went through her special survey only weeks before the accident and ClassNK commented that as part of the on-going investigation, an exhaustive review of *MOL Comfort's* design as well as the plan approval process has been completed. "This review has verified the results of the plan approval process, and confirmed that the vessel design fully complied with all requirements of the ClassNK Rules and IACS regulations.

"A similar review of the vessel's survey records has also been completed, and confirmed that the Special Survey of the vessel completed on 29 May 2013 was carried out in full compliance with the regulations and guidance for Special Surveys. The review also verified that no abnormalities were observed during the Special Survey and that the vessel was in full compliance with all requirements of the ClassNK Rules and IACS regulations at the time of survey completion," ClassNK said.

Like *MOL Comfort*, all the six ships are built by Mitsubishi Heavy Industries, classified by ClassNK with P&I cover from the Japan P&I Club. They are all flagged in the Bahamas except *MOL Commitment*, which is flagged in the Marshall Islands.

The Japanese investigation into containership safety is not the only one in progress at the moment.



Getting further information from the vessel will not be possible as both halves have now sunk

A need for transparency was a key message from Roberto Cazzulo, chairman of RINA Services, as he took over as chairman of the International Association of Classification Societies which has formed an expert group for containerships set to deliver its first results before the end of the year.

The spotlight will clearly be on the recent *MOL Comfort* incident, and what structural factors had to play in it, journalists were told at a press conference in July after he took over as IACS chairman. Cazzulo stressed that while, "in any incident the individual class society will offer its contribution", the aim will be for a more collective approach on the part of the expert group, with an emphasis on the exchange of information.

While preventative measures have already been taken by MOL, in *MOL Comfort*, case he said he hoped that the expert group would be used to identify what other measures could be taken. "Collective is a unique word in IACS", he added, and collective discussions were a key part of its mandate.

Harmonised rules for tankers and bulk carriers are already in the pipeline, but Cazzulo said it was not possible to pre-empt what the expert group on containerships will find. One issue will be to establish if there are good grounds for developing common structural rules for container ships.

While global trends were positive in terms of reducing the lives lost at sea, the general public might focus its attention on a single negative example, he said. The industry could never "sleep on its achievements and needed to be transparent, which might lead the public to "becoming a bit more mature" in its approach to the industry.

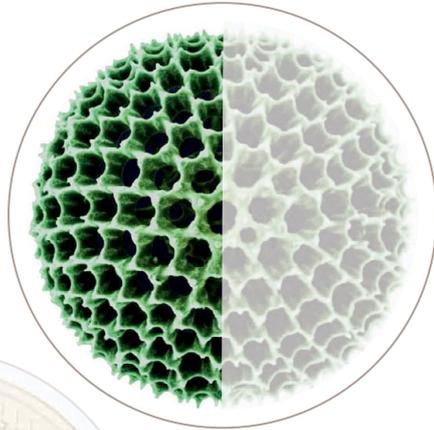
With at least three investigations underway into either the causes of the casualty or the safety of containerships generally, if all of them are delivered on time, there should be plenty of food for thought as to whether any changes to shipbuilding construction, or whether classification society rules needed to be tightened as a result of the findings. The most fortunate thing to say about this casualty, is the crew survived the incident. **NA**

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Cargo handling

MacGregor snaps up Hatlapa

Cargotec's MacGregor has entered into an agreement to acquire privately owned Hatlapa Group, merchant ship and offshore deck equipment provider, for an enterprise value of €160 million (US\$212 million). Hatlapa's main products are a wide range of winches, steering gear, compressors, multi-deck-handler cranes, and other winch related handling equipment. The company's service business includes spare parts, maintenance, refurbishment and training.

The company noted that by acquiring Hatlapa it will strengthen MacGregor's portfolio and market position. "This acquisition is an important step in executing MacGregor's growth strategy and providing customer-focused solutions in both the merchant shipping and offshore segments. The markets are consolidating and MacGregor wants to take an active part in this development. We see a significant growth potential in offshore and are now better equipped to grasp those opportunities. Together we make a strong team with good results. Hatlapa also provides excellent opportunities within services," says Mikael Mäkinen, president, MacGregor.

Hatlapa will be fully integrated into the MacGregor operating structure and will continue its work as a new business line within MacGregor. Hatlapa's reporting will be consolidated into MacGregor's financial reporting once the transaction has been completed. The acquisition is subject to regulatory approvals from competition authorities, which are expected to be received during the second half of 2013.

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Engines

MAN seals the deal for LNG carriers

MAN Diesel & Turbo has won the contract to supply the engines for six Chinese LNG carriers (LNGCs). The order is for the supply of 30 MAN 51/60DF dual-fuel engines for LNG carriers being constructed at Chinese shipyards for a consortium of owners, formed by Sinopec Kantons, MOL and Shanghai-based CSLNG, a daughter company of China Shipping.

The contract for the six LNG carriers order covers five 8L51/60DF engines, all of the engines are IMO Tier II-compliant in diesel mode and will have lower exhaust-gas emissions in gas mode than IMO Tier III stipulates, the company said, along with a fuel-sharing mode which will be applied to each unit.



MAN's 8L51/60DF to be installed in Chinese LNG carriers

Each newbuilding will have a payload of 174,000m³ and be dual-fuel diesel electrical (DFDE)-driven. The vessels will be the first large LNG carriers with a DFDE configuration built in China, noted the company. Steel cutting on the first ship will be in January 2014 with the sixth ship in the series delivered in the fourth quarter, 2017. MAN Diesel & Turbo reports that the engines will be designed and built at its Augsburg works in southern Germany.

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Interiors

Estillon on a cruise

Estillon has outfitted the cruise ship *MSC Preziosa* with its Fenix Base underlay, the ship was delivered to MSC Cruises at the STX France shipyard earlier this year.



MSC opts for Estillon Fenix Base underlay onboard *MSC Preziosa*

The cruise ship has had 25,000m² of the underlay installed to give better comfort, the company says. The underlay is made of composite polyurethane foam and is fully certified, which gives carpet better comfort and durability, claims the company.

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Ancillary equipment

3M grinds on

3M has introduced its range of bonded abrasive grinding wheels into the European market, which are set to offer an innovative approach to the grinding process, the company says.

The grinding wheels use a highly advanced abrasive grain technology, precision shaped grain, introduced with the Cubitron II Abrasive Belts and Discs from 3M. The new grinding wheels are said to be able to cut faster, last longer and require significantly less pressure than conventional grinding wheels.



Cubitron II offers better grinding to the market with its Bonded Abrasive Grinding Wheels

Suitable for heavy weld removal as well as numerous other grinding applications, Cubitron II Bonded Abrasive Grinding Wheels are capable of delivering extremely high cut rates on an extensive range of metals, making them ideal for shipbuilding, maintenance and repair.

An additional benefit is that Cubitron II products will substantially reduce the amount of pressure an operator needs to apply compared with traditional grinding wheels made from aluminium oxide, zirconia and ceramic grain, noted the company.

www.3m.com

Navigation

Korea Lines opts for Voyager 4

Korea Lines has chosen to upgrade its navigation system to the latest Thomas Gunn Voyager 4 chart system. The latest contract will see four LNG gas carriers upgraded from Voyager 3 to the new Voyager 4 digital chart management system with immediate effect.

The latest Voyager offers 100% complete British Admiralty update service, including key compliance requirements, Annual and Cumulative Notices to Mariners, Navarea Warnings and the Admiralty Information Overlay (AIO). It downloads, updates and displays both



Korea Lines upgrades to Voyager 4

AVCS (Admiralty Vector Chart Service) charts and the AIO to overcome any limitations within the ECDIS system to help ensure the safest digital navigation.

The latest Voyager 4 offers a number of additional services, which enable the user to tailor each system to their own operating requirements. Regs4ships, findaport, AtoBviaC, Piracy information (via ICC) and Met515 are all available and displayed on one single GIS interface.

www.thomasgunn.com

Vessel management

CJ Korea Express fits OCTOPUS-Onboard

Amarcon, a member of the ABB group, has announced that it has received an order for two OCTOPUS-Onboard motion monitoring systems for Heavy freight cargo vessels *Korex SPB* no.1 & 2 from CJ Korea Express.

Amarcon's Motion Monitor system (TMS-3) is based on three accelerometers, which will be installed on the two Heavy freight cargo vessels. The system allows for multiple critical locations of the vessel, for instance the cargo, to be measured and displayed on the bridge of the

CJ Korea Express install OCTOPUS-Onboard on its ships

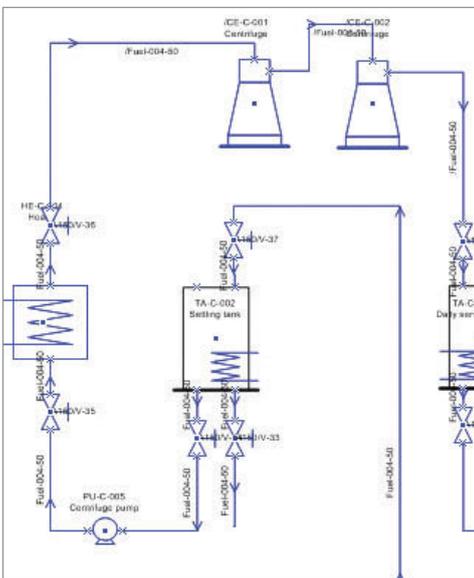




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Undefined	cyan
Information	yellow
OK	green
Accepted Difference	cyan
Check Required	limegreen
Warning	yellow
Minor Error	yellow
Member Attribute Diffe	orange
Attribute Difference	orange
Sequence Difference	orange
Connection Error	royalblue
Item Missing	yellow
Not Matched	brightred
Critical Error	brightred

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vessel. By using OCTOPUS-Online, the vessel owner can also download and display all measured motions and accelerations that are collected from the vessel. The integration of Google Maps provides an accurate viewing of routes and ship positions. The data is downloadable for further evaluation in the office.

www.abb.com

CAD/CAM

Aveva launches Bocad software

Aveva has released its Aveva Bocad range of structural steel detailing software. The latest products are set to increase the user's structural detailing capability and enable more design standardisation and automation, claims the company. Together, by enabling more effective decision-making and increasing project transparency, these new features offer potential project time and cost savings of up to 30-40%.

In addition, Aveva Bocad has been integrated with Aveva's 3D design products, Aveva Everything3D, Aveva PDMS and Aveva Outfitting. Engineering contractors and fabricators working in the Process Plant and Marine industries will be able to achieve greater productivity and project quality, by eliminate many sources of errors, leading to time and cost savings, highlighted Aveva. Advanced change highlighting and real-time updates will also give the user swift and effective communication between design teams to achieve time and cost savings.

www.aveva.com/aveva_bocad_steel

Deck equipment

TTS decks out in Korea

TTS Group has through its subsidiary TTS Marine GmbH in Bremen signed three contracts for deck equipment with a value of approximately NOK46 million (US\$7.8 million).

The two contracts have been signed with a Korean shipyard for the supply of anchor and mooring winches for seven new ships under construction for German and Greek shipowners.

In addition, a third contract has been signed with another Korean shipyard concerning hatch covers for five new container ships under construction for a Chinese shipowner. When launched, these container ships will be among the largest in the world (18,400TEU). The deliveries will take place in 2013 and 2014.

www.tts-group.com

Cranes and cargo handling

Liebherr swings into action

Liebherr has received an order for the delivery of



Liebherr gets orders from Rickmers for its heavy-lift CBB cranes

six heavy-lift ship cranes for the traditional German shipping company Rickmers.

Four of the heavy-lift cranes are type CBB 4700 with a lifting capacity of 450tonnes and the remaining two are type CBB 3450 with a lifting capacity of 120tonnes.

The six heavy-lift cranes are to be built by Liebherr-MCCTec Rostock GmbH and will be delivered to the customer in 2014. They will be installed on two ships in the Hudong-Zhonghua Shipyard in Shanghai, China.

Liebherr says that the CBB cranes have a comparatively low total weight and a low centre of gravity, allowing for better ships' stability. This stability and better handling has been provided by the Litronic control system.

www.liebherr.com

Communication

Jeppesen partners FarSounder

Jeppesen and FarSounder have announced a joint promotion for the FarSounder-500 and FarSounder-1000 sonar systems. FarSounder's software will use Jeppesen charts as part of their 3D forward looking sonar's chart overlay feature. Jeppesen has said that it will provide a three month trial of the latest Jeppesen charts for key regions of the customers' travel areas. The promotion will run through 1 March 2014.

"We welcome this opportunity to strengthen our partnership with Jeppesen, one of the leading global providers of digital vector chart data," stated Matthew Zimmerman, vice president of engineering, FarSounder. "Chart overlay is a valuable feature, which aids operator comprehension and enables users to more quickly see where potential navigation obstacles are located."

www.farsounder.com



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Getting to GRIPs with fuel efficiency

Energy Saving Devices (ESDs) are designed to prevent the inevitable energy losses in the ship propulsion system or to recover some of these losses. The GRIP project has been established to examine these ESDs

The idea of an ESD is not new; during energy crises and other periods where shipowners have an urge to reduce the operational costs a great deal of attention is paid to the development of such devices. ESDs have been tested in model basins and have shown great potential for some cases at model scale; correlation with full-scale performance cannot always be found.

It is the objective of the FP7 project GRIP (Green Retrofitting through Improved Propulsion) to obtain an insight into the working principles of ESDs and validate the potential by full-scale trials.

Furthermore, GRIP focuses on the (retro-) fitting process including the costs to provide shipowners with a decision making tool concerning the payback period of ESDs. An example of an ESD retrofit, a Wärtsilä EnergoProFin is shown in the figure below.

Wärtsilä EnergoProFin as retrofit

GRIP will develop an Early Assessment Tool (EAT) of which a simplified version will become publically available. The energy saving potential is determined through the gained knowledge and improved designs which will come from the improved knowledge on the working principles. This improved understanding comes from applying the latest numerical tools to the flow calculations.

GRIP partners will also look at the building process to optimise the process and reduce docking time and costs. The complete design and fitting practice will be validated by a test case where an ESD will actually be fitted to a ship. During this process the energy saving at full scale will also be validated.

Early assessment Tool

The field of application of an ESD is often not made clear by the manufacturer, which makes it difficult for a shipowner to select



Wärtsilä EnergoProFin as retrofit

the best ESD for a specific vessel. Next to that, reliable performance data of these devices is not readily available. Therefore, the GRIP project will deliver an EAT for shipowners to characterise the potential energy and emission reductions and associated costs in case of retrofitting.

The EAT will be released as a web-based tool for public use with an extended version for GRIP project members. Target users are the technical staff of shipowners, consultants etc. The tool is meant to give guidance in the preliminary selection of ESD's.

The EAT will determine the viability of various ESD's based on a limited amount of general input data such as vessel type, main engine power, vessel speed and propeller diameter. The tool is aimed specifically at vessel types which have a dominant share within the world fleet regarding fuel consumption: tankers, bulk carriers and container ships.

For the selection of ESD's to be analysed within GRIP, a set of assessment criteria were defined. Based on these considerations three types of ESD's were chosen: pre-swirl

stators, upstream ducts and propeller hub loss recovery devices (e.g. hub cap, rudder bulb and small rudder stator fins).

Part of the assessment is the option to review ESD performance data as described in literature. For this purpose a database with reviewed papers is added to the tool. To date, over 40 papers have been added to the database. A cost model completes the EAT and makes it possible to judge the economic viability of various ESD's. The cost estimate is based on the actual component and installation costs. The benefit is based on a suitable measure like a return on investment.

CFD-based design procedure

One of the reasons for the reluctance of shipowners to invest in ESDs is the uncertainty in the performance gains at full scale. The latest CFD techniques available are used in GRIP to set up a design procedure including the analysis of the hull – propeller – ESD interaction.

Current CFD tools are capable of capturing small deviations in the flow caused by the presence of the ESD for

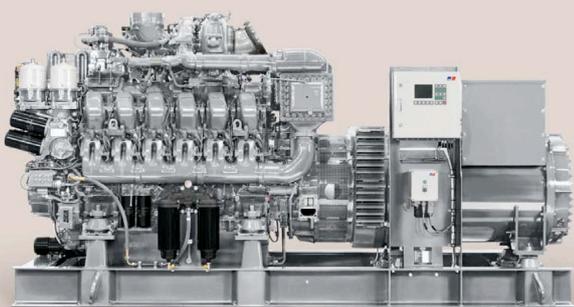


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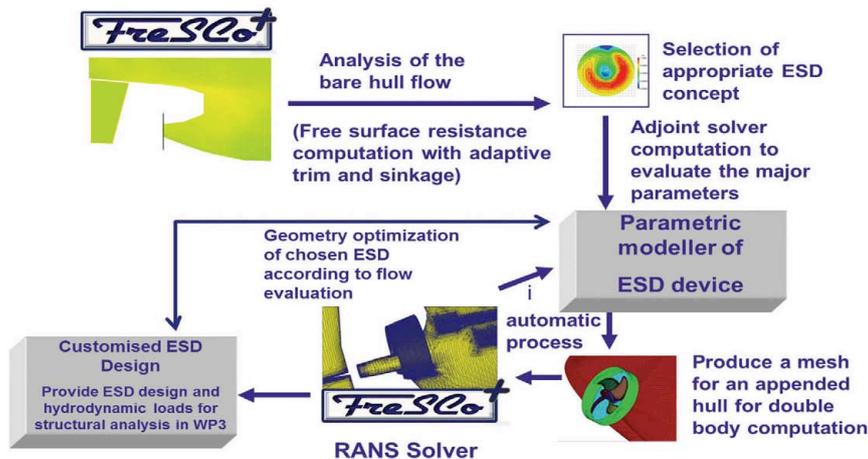
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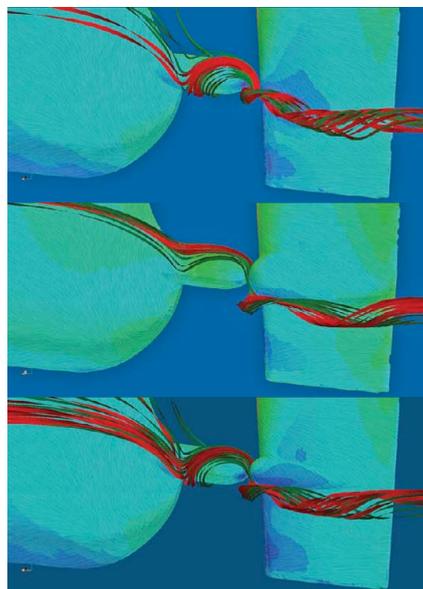
Optimisation flow chart using RANS method

both model and full-scale vessel. These new capabilities are utilised in accurate analysis of the improvements of propulsion efficiency by an ESD. A fully automated optimisation process, as illustrated in the figure below, has been applied by GRIP to obtain an optimised ESD design.

Optimisation flow chart using RANS method

A parametric variation has been completed for a rudder bulb installed on a bulk carrier. One single design variable, being the bulb thickness, has been varied with constraints being $\pm 20\%$ of the initial values as first step.

The streamlines in the below figure indicate that the bulb reduces the energy loss in the hub vortex, especially in the case



of the optimised geometry. The figure also shows that the hub vortex is mainly present on the port side of the rudder. This prompts the idea that the potential of energy saving may be further improved by an asymmetric rudder bulb.

Further investigations using a newly developed adjoint solver are envisaged to see whether the sensitivities would also indicate an asymmetric design of the rudder bulb in this case. Two different object functions are applied: the total resistance and the rotational energy behind the ship.

A similar optimisation will be done for the three ESD types also included in the EAT for a container vessel, a bulk carrier, a ro-ro vessel and a reefer ship. The analysis will study an optimised design as well as scale effects on the ESDs.

Structural assessment

Today the ESD structure is not reviewed, only its attachment to the hull is considered. Estimating the loads on the ESD is challenging and regulations give no guidance to validate the ESD design. The GRIP project tackles this challenge by developing a methodology to assess the strength and to approve the ESD design

Streamlines passing through the propeller hub of the FORMPRO bulk carrier for cases without bulb (left) and with the baseline (right) and the optimised (bottom) rudder bulb using only the bulb thickness as a single design parameter

considering static and dynamic loads, fatigue life and vibrations.

The main challenge is to evaluate the dynamic loads applied to the structure in sailing conditions. In order to consider the dynamic loads, Bureau Veritas has developed a methodology to define the maximum forces applied to an ESD in the design wave condition. This methodology is based on the local flow incidence variation and the estimation of the inertia loads on the ESD.

The first step of this methodology, as indicated in the workflow figure below, consists of hydrodynamic computations for a specified velocity using BV's HYDROSTAR software. From the resulting fluid velocity Response Amplitude Operators (RAO's), a long-term spectral analysis over the ship life is done using BV's STARSPEC software.

The third step transforms spectral analysis into the time domain to calculate the non-linear ship response of the equivalent design wave. In the final step the pressure distributions from the CFD computations are set on a Finite Element Model (FEM) of the ESD structure using an interface specifically developed in the GRIP project.

Global workflow for strength assessment

Further focus of the structural work group is on the vibrations of the ESD caused by fluid-structure interaction. Vibration induced by fluid flow can be classified by the nature of the fluid-structure interaction. The main objectives of these investigations are to develop software able to compute the natural frequencies of the structure depending on fluid velocities and the associated damping and to give recommendations to designers in order to avoid them.

Assessment of the ESD structure only is not sufficient, it is also important to ensure that the ESD installation does not modify the significant loads applied on the structure surrounding the ESD. Flow modification could change pressure distributions on structures such as rudder, shaft bracket and shaft line. A comparison of computations with and without an ESD allows an estimate of

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XBow model courtesy of Ulstein Group ASA

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- Electrical Cable Router
- eBrowser model comparison
- eBrowser location views
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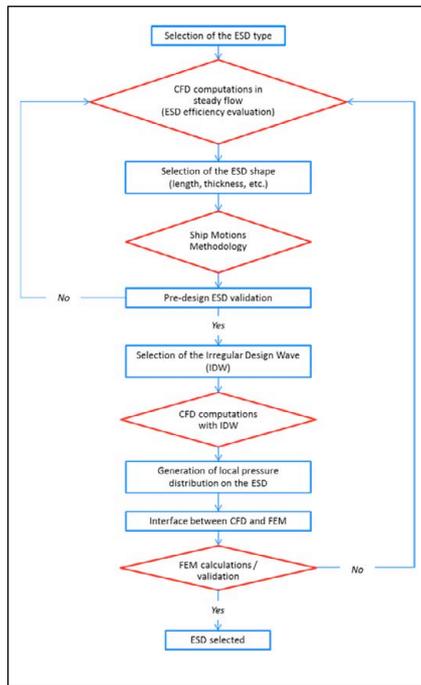
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Global workflow for strength assessment

the effect of these modifications on the structural response.

Retrofitting process

Perhaps an unexpected uncertainty in retrofitting vessels with ESDs is the actual shape of the hull. Unfortunately, detailed information on the geometry of the hull is often not available for the shipowners. Ships change owner quite often, diffusing existing information. Many shipyards do not disclose the actual ship geometry to the shipowner, enforcing the owner to return to the original yard for fitting appendages.

To make the shipowners independent of the original yard, methods are developed within GRIP to determine the exact geometry of the ship.

Different methods of measuring the ship hull were studied. During the selection process it was shown that Photogrammetry and Photo modelling are suitable technologies to measure the possible application cases.

Photogrammetric systems with a high mobility can be used for complex structures and where a high accuracy is needed. Photo modelling is primarily applicable for the fast capture of complex geometries with a relatively low requirement concerning the accuracy of measurements.

First test measurements with the selected measurement systems were carried out.

This allowed for the achievable accuracy and the operation of hard- and software to be examined. Furthermore, first 3D models of test objects, which represent structures in the project scope of GRIP, were created. An example of a rudder model is shown in the figures below.

Another obstacle for retrofitting ships is the cost of investment. The actual costs of an ESD are rather modest compared to the loss of earnings due to downtime in the dock. More efficient retrofitting processes are needed without endangering the accuracy of the retrofitted device.

A business process model and a retrofitting technical process model were created within GRIP to represent the requirements of a retrofitting process in a shipyard. At present a simulation model is already modelled according to the layout of Fincantieri Shipyard in Trieste. The simulation model consists of a dock, warehouse and connecting roadways between dock and warehouse.

At present, a model Ship has been created in the dock. The dock is modelled with a crane that has a maximum capacity of 19tonnes. For testing purposes, at present a simple retrofitting procedure of a single device is performed in the simulation model. Upon receiving further details on the Ship dimensions, ESD installation procedure and details for the aforementioned tables, the simulation model will be further developed.

Validation

Validation of the actual fuel saving effects of an ESD is an important aspect of a retrofit process. Validation will be done on a vessel directly after it has had its routine dry-dock hull cleaning, and directly

after it has left the dock for the second time for the fitting of the ESD.

In order to improve accuracy of the speed/power trials, sensitivity studies will be made to identify which factors affect trials most, and can be minimised. A trial practice and analysis methodology will be established that allows ESD validation with sufficient accuracy for validation purposes.

Apart from the validation of the fuel saving effect of the ESD, the flow improving properties of the ESD will be validated. This will be done by full-scale flow measurement. For this purpose, a flow measurement system will be developed and tested based on Laser Doppler Velocimetry.

The sensor will be compact enough to be used within the tight spaces between frames of a ship, and allow the measurement of 2D flow field surrounding the propeller. Only one dry-dock will be required to install the portable instrument. No divers will be required for operation (e.g. for calibration purposes). Trials are scheduled for early summer 2014.

Outlook

At the time of publishing the project has just passed the midterm and has already reached significant results. The next steps in the research are to design ESDs for a number of target ships. The sensitivity to the energy efficiency improvement of an ESD to the operational profile of specific ship types will be studied. This will result in an ESD optimised for a validation case. In order to validate the performance improvement, the ESD will be manufactured and fitted to the ship and trials will be done before and after installation of the ESD.

On 7 November 2013 the GRIP project together with the RETROFIT EU project will hold a workshop at the Europort conference where the intermediate project results will be presented. The workshop is open for all. **NA**

Authors

Maarten Flikkema (MARIN), Anton Voermans (Wärtsilä), Yan Xing Kaeding (HSVA), Stephane Paboeuf (BV), Thijs Hasselaar (MARIN)



Rudder model (left) and point cloud of the rudder measured with Photo modelling (right)

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The art of balance: China's path to developing ultra-large containerships

The 16,000TEU containership model developed by MARIC (Marine Design & Research Institute of China, No. 708 Institute of China State Shipbuilding Corporation (CSSC)) has recently gained recognition from the international market, Hu Yu reports

CSSC (Hong Kong) Shipping Company Limited has ordered three vessels of the 16,000TEU type from Shanghai Jiangnan Changxing Heavy Industry Co Ltd and Shanghai Waigaoqiao Shipbuilding Company Limited and is negotiating leasing contracts with for the three new ships.

China is ready for the Ultra Large era

In order to compete with South Korean shipyards, Chinese shipbuilders must enter the ultra-large boxship market as many liner operators are heading towards the ultra-large ship operation model.

The ultra-large containership project at MARIC is one of the breakthroughs of CSSC, which aims to develop high-end ship models. The project has also helped the group evolve from a follower to a technology leader.

Nevertheless, Chinese yards are behind their South Korean counterparts in terms of design and construction capabilities in the ultra-large containership market. "The gap between the two groups of shipyards does not only reflect on design quality and performance of their products, but also on ship prices and delivery schedules," says Yu Lai, deputy chief engineer of MARIC and head of containership division of CSSC.

Yu adds that Chinese yards have no competitive advantage when compared with South Korea's. If China does not achieve a breakthrough, the gap between shipbuilders of the two places will only grow larger. Due to the advancement in construction technology, South Korean shipyards can deliver one vessel a month easily – which is important to liner operators, while only a limited number of Chinese yards can do this.

"To stop the monopoly of South Korean shipbuilders in the ultra-large boxship market, we must change our ship design concept. If we always only follow others, we



MARIC's 16,000TEU containership is a result of a change in ship model design concept and communications and interactions with liner companies, classification societies and equipment suppliers

will only be able to bag newbuilding orders in a good market, and eventually lose our competitive edge and receive no orders in difficult times like now," Yu says, "therefore, we have to lead the market in terms of ship model development, and meet shipowners' demands ahead of everyone else. To do this, we must understand the operational conditions of shipowners and be able to integrate different technologies."

With the help of China Shipbuilding Trading Company, MARIC has strengthened its communications with international liner operators and has collected data on what owners demanded from ultra-large container ships over the past two years. The institute has also exchanged ideas on the application of various technologies with shipowners to prepare for new ship model developments.

"Whether a model is good or bad depends on its ability to meet shipowners' demands at the moment and in the future. Research must

be conducted to discover the real needs of shipowners," says Yu. The communications between MARIC and international liner companies have helped the institute to locate the most important areas to focus on when developing new ship models.

Beauty of balance wins buyers' hearts

Shipowners that operate large container vessels are rather stable. They put particular emphasis on the integrated performance of ships and the brand of shipbuilders while placing new orders.

Chinese yards have had no experience in designing and building 16,000TEU ships before receiving the latest orders from CSSC (Hong Kong) Shipping Company Limited, which often means they will not be considered by buyers in the first place, according to Yu. Therefore, the question is how Chinese yards can show they have the right design

and construction capability to shipowners. The design team at MARIC aims to strike a balance between the various requirements in a number of areas highlighted by shipowners.

It is very difficult to develop an ultra-large containership without experience. MARIC has therefore decided to start with exchanging ideas and cooperating with institutes with different specialities, such as classification societies, shipyards and equipment suppliers.

Another obstacle for the design team is a lack of international data on ultra-large container vessels. In order to solve this problem, Yu asked the team to substitute real figures with reasonable hypotheses. "In fact, it is very difficult to develop a new ship model based on mere hypothesis," said Yu. He added it is necessary for the design institute to meet all the technological requirements and indices to win the approval from shipowners.

However, the above were not the most difficult issues the team had faced during the R&D process. The toughest period came when the Euro crisis hit and a shipowner cancelled an order for the new model following difficulties in obtaining financing.

"We lost the drive to finish the project. We asked ourselves if we should still continue," Yu said. It is common sense that the risk of investing huge resources in new model development without securing an order is very high. "Our rationale to continue was that if our group is determined to enter the ultra-large boxship market, we will have to do all this work one day. It's better for us to finish it sooner than later. And we should not give up half way," he said. The team thus continued its work and kicked off various design and testing tasks for the new model.

"I think our model of 16,000TEU containership has achieved the beauty of real balance by delivering the best performance in many aspects," said Wang Cailian, deputy head of general design division of the civil vessel department at MARIC. In order to avoid short plate design and to fulfil the present and future needs of shipowners, the team has started the design process with the most basic steps such as the selection of the engine room location, according to Wang.

"If the design of an 8,000TEU containership model is regarded as undergraduate level, the design of 16,000TEU boxship should be regarded as postgraduate level," said Han Yu, deputy head of structural design division of civil vessel department of MARIC. For container vessels that are longer than 350m, the structure of the ship body is a critical part of the ship design.

Through conducting a large amount of tests and considering many different methods such as the application of high tensile-strength steel, the team has finally come up with a satisfying solution and solved problems such as engine room front-end fatigue. The team has also managed to attain relatively desirable performances in various aspects such as bending moments, light ship weight and ship speed etc.

"We realised that with the existing size and strength of ship plate, our original design may not work. Therefore, we have restarted the design project based on existing technology standards," said Han. Based on test results, MARIC's design of 16,000TEU containership is not inferior to those delivered by South Korean shipyards in terms of statistics. But, the institute understands that it is not enough

to win shipowners' hearts and to lead the market. MARIC aims to create new value for shipowners based on their real operational conditions.

"In the current market, the same ship model may create different levels of economic return under different operational styles. With the same ship, some shipowners win and some lose. Why is that?" asked Yu, "Because there is no best ship design, but only the most suitable design for each shipowner."

To create a model with the best integrated performance, the design team of MARIC has proactively communicated with shipowners to understand their needs, operational conditions and styles before moving on to the next step.

"We know the no-load ratio and at berth requirement of the shipowner well, therefore we have adjusted our design so that the 16,000TEU boxship has better fuel consumption performance while sailing at 13-23knots. This will allow shipowners to operate the ship flexibly and save fuel and create a unique advantage of the model," said Wang.

MARIC's 16,000TEU containership model has showcased the highest level of R&D capability of Chinese shipbuilders and there is not much room for improvement at the moment taking into account the current technology level of the Chinese shipbuilding sector, according to Yu. "As the operation conditions of shipowners change and our technology level improves, there will be room for improvement. We will then follow up with the changes and provide relevant upgrade solutions," Yu concluded. **NA**



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Learning from the navy

Sherwin-Williams is applying technology that has been developed for the US Navy to protect the ballast tanks of commercial vessels

Mitigating ballast tank corrosion is essential in ensuring safe operations and longevity for commercial vessels worldwide.

The plate and structural members found within seawater ballast tanks provide vessel strength and integrity analogous to the human skeleton. Because the combined square footage of all tanks exceeds that of the entire exterior hull, it has become mission critical for shipowners to find long-term solutions to prevent corrosion and thereby reduce total ownership cost.

With the implementation of the IMO's Performance Standard for Protective Coating (PSPC), controlling corrosion in ballast tanks is now a defined requirement.

These standards were designed to provide effective ballast tank coating lifecycles of 15 years. Some large vessels, for instance, have as much as 92,903m² of surface area in their ballast tanks. The potential cost of coatings and/or steel replacement due to corrosion from premature coatings failure can become a significant cost driver, resulting in lost revenues.

Unfortunately, due to difficult access, poor visibility, and complex structural geometries, controlling corrosion in these tanks is challenging. As a result, commercial owners are now giving careful consideration to advanced technologies used by the US Navy that help overcome the limitations of the epoxy coatings traditionally used in ballast tanks.

In the interest of reducing total ownership cost for the fleet, the US Navy shifted from solvent-based polyamide cured epoxies to ultra-high solids (UHS) coatings, which have lower volatile organic compounds (VOC), edge retentive characteristics (over 70% of dry film retained on edges), and resulting extended service life.

That shift resulted in a 20-year life expectancy for ballast tanks painted with these UHS coatings, compared to less than five years when using solvent-based systems. After more than 13 years since initial application of UHS coatings to the US Navy's fleet, indicators to date are favourable in meeting that 20-year life cycle expectation based upon Naval Sea Systems Command (NAVSEA) tank inspections.



Due to the complex structural geometries of marine ballast tanks, controlling corrosion can be challenging

Once extended lifecycle requirements were addressed, the US Navy challenged manufacturers to develop coatings to achieve faster return to service through accelerated recoat and cure to service intervals and a reduction in the number of coats applied. The ultimate goal was a single-coat ballast tank system capable of providing a 20-year service life. It was out of that intensive research and development effort that Sherwin-Williams' Fast Clad ER was born. Fast Clad ER is edge-retentive, cures to recoat within one hour, and can be placed into immersion service in 24 hours at 25°C.

"This rapid return to service dramatically reduces scheduling time associated with traditional coating application and cure," says Tony Lambrosa, Protective & Marine Research & development manager, The Sherwin-Williams Company. "It is now possible to apply a full coat in the morning and begin touch-up in the afternoon."

Fast Clad ER can be applied as a single coat system for ballast tank service with a minimum DFT of 20mils (500microns). Through the use of this new coating technology, the US Navy has realised a 20% reduction in total paint application costs, and a 50% savings in repair schedules.

"We can also formulate Fast Clad ER with fluorescing optically active pigments that enable applicators and inspectors to easily identify holidays, pinholes, defects and areas with improper film thickness using simple visual inspection tools, thus preventing costly rework and premature failure," says Lambrosa. The technology is fully detailed in *SSPC Technology Update No. 11: Inspection of Fluorescent Coating Systems*.

"Fast Clad ER exceeded all expectations from a performance perspective," says Lambrosa. "The system's robustness has made it practical to transfer this technology to commercial marine applications. It has also been the platform for product innovations that are highly effective in the water-wastewater, rail and petrochemical sectors that had the same need for single-coat, high performing, rapid return to service coatings."

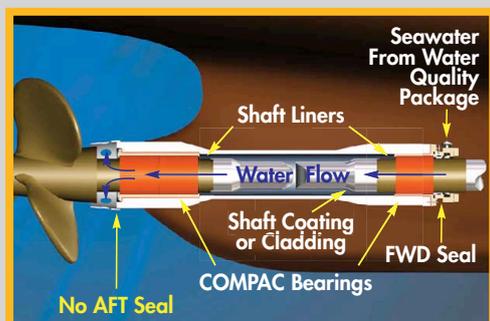
One of the most natural transitions for Fast Clad ER was for commercial ballast tanks. All US Navy tank linings are qualified to MIL-PRF-23236 and rigorously tested for critical performance characteristics. Many of the US Navy requirements meet or exceed the test requirements for IMO PSPC. Key among them:

1. Cathodic protection compatibility – A 90-day test to ensure coatings can withstand

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the rigours associated with cathodic protection requirements for sacrificial and impressed current.

2. Edge coverage – Testing ensures coating meets the 70% edge retention requirement on a 90deg angle compared with the adjacent flat areas.
3. Dedicated seawater service – One year cyclic immersion comprised of salt water immersion, air dry, and hot water exposure (80°C minimum).
4. Fuel & fuel/seawater ballast service – One-year cyclic immersion comprised of salt water immersion, aviation fuel and hot water exposure (80°C minimum).
5. Aviation fuel compatibility – Immersion testing to ensure that the coating does not degrade or compromise fuel quality.
6. Collection, holding & transfer (CHT) service – A 20-week cyclic immersion consisting of exposure to acetic acid, ammonium hydroxide, sulphuric acid, urea and cleansers to verify suitability.
7. Single-coat coating systems – The above series of tests performed on single-coat applications in lieu of traditional primer and topcoat application.
8. Numerous other requirements regarding VOC, HAPS, stringent limitations on heavy metals, safety, application parameters, and cure properties.

PSPC code's genesis was tied to changes in modern ship design such as the use of computer modelling and high-tensile carbon steel. While these advances allowed



Tank interior coated with Fast Clad ER formula with fluorescing optically active pigments to ensure proper film thickness during application

shipbuilders to minimise plate and structural member thickness and reduce overall vessel cost, when steel thickness was reduced, so was the standard margin of error for corrosion allowance.

Corrosion of vessels designed in the 1970s and 1980s, coupled with the lack of formal coating requirements such as the PSPC rules, led to catastrophic ship losses. IMO's adoption in 2006 of Resolution MSC.215 (82) was aimed at protecting ship integrity, its crew and the environment.

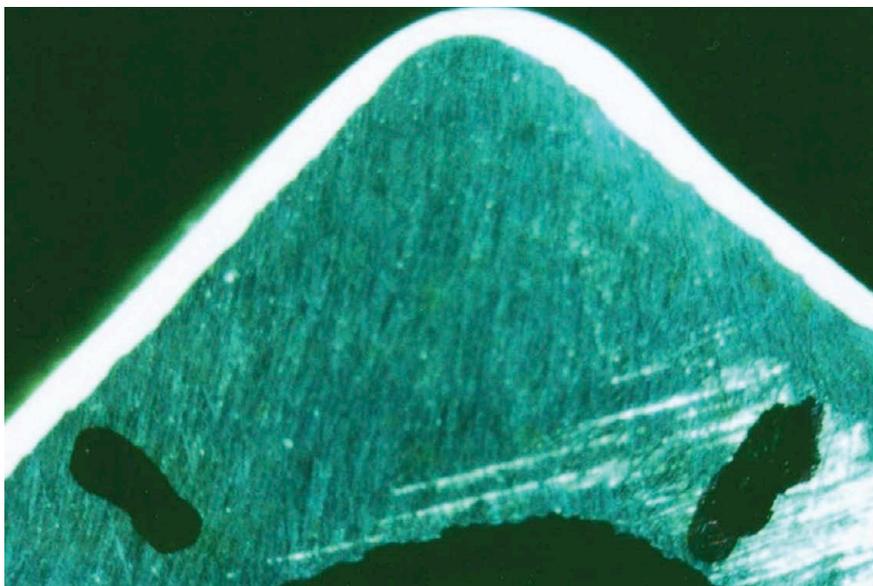
The PSPC regulation took effect via an amendment of the Safety of Life at Sea (SOLAS) II-1/3-2 regulation, and has been mandatory since 2008 for dedicated seawater

ballast tanks on all types of ships of not less than 500gt and for double-side skin spaces of bulk carriers of 150m in length or greater.

The PSPC rule's useful coating life of 15 years is considered to be the time period, starting from initial application, over which the coating system is intended to remain in 'good' condition (the equivalent of less than 3% breakdown). Approval for a coating can be achieved either by extensive laboratory testing or by five years minimum in-service exposure with a final rating of 'good'.

Critical performance is verified through lab testing in which the coatings are subjected to simulated ballast tank service conditions such as cathodic disbondment, wave action, cyclic heating and cooling, and hot and cold wall effect exposures. Once the full coating system, including any specific preconstruction primer, has been evaluated, it is eligible to receive an IMO PSPC Type Approval certificate. At the time of writing, the Sherwin-Williams' Fast Clad ER is in the Type Approval process.

The combination of single-coat, rapid-cure, edge-retentive and fluorescing features in one protective coating system changed the game for the US Navy. Now this next-generation coating technology is bringing reduced schedules and lower total vessel ownership cost benefits to commercial owners worldwide. **NA**



Magnified view of an effective edge retentive coating (over 70% dry film retained on edges)

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Top yards suffer in aftermath of economic decline

A rapid three-year decline in global orders for new merchant ships caught up with shipbuilders this year, and nowhere was that more evident than at some of China's top yards, writes Mark Vassel

With new orders at Chinese yards having fallen by two thirds between calendar years 2010-12, even a recent surge in orders – 22.9 million dwt in the first six months of this year – has done little to dampen calls for a consolidation of the country's more than 1,600 yards.

The China Association of the National Shipbuilding Industry (CANSI) in July said over 500 yards may have to close within five years. Last year, one in five lost money.

With hundreds of hungry shipyards competing for limited business, the downward pressure on prices derailed some of China's top shipyards.

Jiangsu Rongsheng Shipbuilding Co, China's biggest private yard, in July sent shockwaves through the industry when it appealed to the government and shareholders for a cash injection after losing more than RMB620 million in the five quarters to 31 March, this despite receiving almost RMB1.3 billion (US\$211.78 million) in state subsidies over the same period.

Korean-owned STX Dalian, China's No 6 yard by orderbook, was put on the auction block in the second quarter to help overcome the debt crisis at its parent; Dalian's city government has distanced itself from purchasing the yard, leaving the China Industry Shipbuilding Corp, state majority owner of many of China's northern shipyards, as likely buyers, according to local reports.

With two of China's most successful yards buried under mounting debts, analysts are rightly asking who will be next. China's top yards were still building ships but, for many, profits were proving elusive.

In Beijing, the Chinese authorities were concerned about the fortunes of their shipbuilders, but they could not have been wholly surprised.

In 2007, China's state planners, unfazed by the sudden rise of the country's shipyards towards the top of the world shipbuilding charts, warned that only a similar sprint up



China sees decline in its order book

the technology ladder would secure their long-term dominance.

In its July 'compendium' from that year, the powerful Commission of Science, Technology and Industry for National Defence (COSTIND) mandated three main avenues of technological development to secure China's position atop the global shipbuilding ladder.

With a written mandate that was unusually direct, it said China's shipyards and their supporting industries must:

- Focus on the basic and generic technologies that are conducive to the development of different ship-types, and the emerging green (environmental) and safety-related technologies
- Optimise and upgrade major ship types in light of the latest international standards, rules and regulations
- Make breakthroughs in the core technologies of selected new hi-tech ship-types in markets which have strong potential, while developing independent research, design and building capabilities ...

COSTIND's leadership will take cold comfort in knowing the directives were

prescient, but that a prolonged economic slump, over-capacity and industry hubris had limited their shipyards' ability to follow them.

With nearly all resources directed towards fulfilling delivery of their bulging orderbooks from 2007-2010, many yards failed to ensure strategic product and financial planning.

In short, for many onlookers, some of this year's events were predictable.

According to CANSI, revenues of the 80 benchmarked Chinese yards it monitors fell 18.5% year-on-year to RMB120.3 billion in the first half; more worryingly, their profits collapsed by 53.6% to around RMB3.6 billion

CANSI attributed the profit fall to higher expenses, due to rising financing costs, increased labour expenses and the stubbornly high cost of raw materials.

China was not alone in feeling the pinch. The industry has seen the global orderbook fall to 16% of the fleet from 51% since 2009, according to a presentation given by Clarkson Asia's managing director Martin Rowe made in March.

But, China's stubborn dependence on the construction of lower-value ships such as bulkers and its failure to rein in burgeoning



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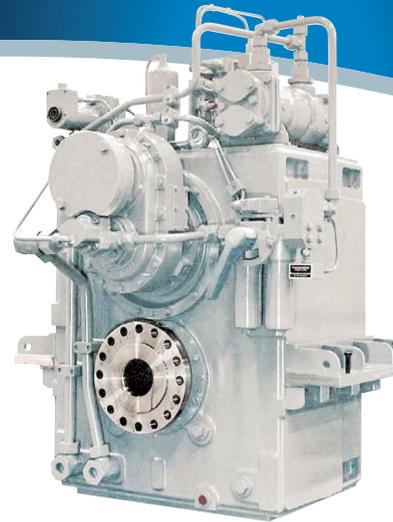


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construction capacity made its builders more vulnerable to the inevitable pricing pressure than its regional competitors.

It is that 'bulker' dependence that analysts said was at the core of Rongsheng's recent problems, despite having secured the sector's highest profile order: 16 400,000dwt bulkers from Vale and operator Oman Shipping, in a deal reportedly worth US\$2.1 billion.

Bulk carriers represented about 60% of Rongsheng's orderbook in June.

Some shipyards in China have managed to diversify into building higher value vessels; in June, for example, Shanghai's Hudong Zhonghua Shipbuilding secured an order for six 174,000m³ LNG carriers from the state-owned China LNG.

But, China's orderbook remains dominated by lower value ships. According to Clarkson's *China Intelligence Monthly* for May, 296 of the 467 ships the country's yards had on their books were bulkers, or 63% of orders.

To be fair, some of China's builders and design houses have taken steps of varying magnitude up the technology ladder since COSTIND's 2007 pronouncement.

For example, there have been advances in hull and propeller designs, which have seen some yards promote new ships offering up to 40% less daily fuel consumption against what was on offer just three short years ago, according to a senior class executive.

That society is also currently involved in about 10 LNG-as-fuel research and development projects with Chinese yards and design houses.

However, COSTIND's leaders undoubtedly would have envisioned more ambitious advancements by now. Analysts say China's inability to shake off its reputation for inexperience in project and production planning is limiting its success in the two high-value sectors that are defying the present shipbuilding downturn: offshore and gas.

According to a Clarkson report in March, two thirds of the US dollar investment in shipbuilding was divided between offshore and gas; and China has been a spectator for most of it.

As of March, the value of the global orderbook for commercial shipping was US\$180 billion, against US\$170 billion for offshore construction such as mobile offshore drilling units and their associated storage, production and support vessels.

Chinese yards have made a few forays

into construction for the offshore industry, most notably in Dalian, where Cosco has won contracts for drill ships and where Seadrill has ordered eight hi-spec jack-up rigs at Dalian Shipbuilding Industry Corp (DSIC). Shanghai Shipyard has also won two orders for drillships from the Thai-owned Opus Offshore.

But, much of what been contracted in the offshore sector this year – 24 rigs with an aggregate US\$5.5 billion, according to CANSI – was at the bottom end of the market, CIMB analyst Lim Siew Khee told investors in a recent note.

"Other than [DSIC] and [Shanghai Waigaoqiao], which have the financing muscle, other aspiring Chinese yards such as Yangzijiang, [Cosco Dalian] and Rongsheng are entering the jack-up space with lower-spec rigs," Lim said.

Industry concerns about China's inexperience having the potential to cause late deliveries and budget overruns for these capital-intensive projects have affected its ability to land more of the higher-value work, despite any technical advances individual yards may have made.

"Undoubtedly, the top Chinese yards are streets ahead of where they were a few years ago in terms of capability. However, our industry is conservative and having the ability to do something and convincing clients of that are two different things," Clarkson's Rowe told *The Naval Architect*. "To a lesser or greater extent, the clients and some of the entities financing them remain circumspect about Chinese yards. Whilst there are yards in China who would love to be given a chance to build, for example, the complex topsides of offshore structures, time and again it's Korean yards who snatch up those orders."

Matthew Flynn, managing director at Worldyards, agrees that Chinese yards have made advances in attracting offshore business, but says most still have some way to go to match their regional rivals.

"China is making some strides, but the projects they are working on are not as complicated, certainly as those undertaken in Korea, and in Singapore," Flynn said. "Newcomers to the offshore sector are more likely to order in China rather than in Singapore or Korea, where the established [offshore] players have established relationships with the yards."

The Chinese authorities, however, are clear about the strategic importance of the sector, not only to ensure the health of their shipbuilding industry, but also to secure national interests such as energy supply.

At the 18th National Congress of the Communist Party of China in November, the central government named the offshore industry as part of its National Ocean Defence Strategy, promising to invest and develop a supportive national policy framework.

As with the offshore sector, China has made only a modest foray into building large gas ships, mainly LNG carriers. All orders for the bigger ships have fallen to Hudong Zhonghua Shipbuilding (HDZ).

Cosco's Dalian Shipyard and Tianjin Xinhe Heavy Industry both secured orders for smaller LNG carriers (below 40,000m³) this year, but Hudong remains China's uncontested leader in LNG gas-ship construction.

Jiangnan Changxing Shipyard is leading China's LPG construction market with a modest orderbook of eight ships.

HDZ secured China's first orders for LNG ships in 2003; it delivered the first 147,000-cm³ ship in 2008 after an arduous four-year construction period, an important milestone for China. But, there remain significant questions about whether it can build these ships profitably, with some people close to the initial project suggesting that the yard lost millions, if not 10s of millions, of dollars on every unit.

Nevertheless, with Korea's leading yards able to build and deliver similar ships in under a year, it is likely to be many years before China is able to capture a meaningful share of this high-value market.

Until then, demands for consolidation will grow louder.

China had 1,647 shipyards with annual sales of more than RMB5 million (US\$818,000) at the end of 2012. But, history suggests that closure of the poorer performing ones will be easier said than done, according to Flynn.

"I wouldn't hold your breath [for yards to close]. Historically, it has taken a long time for shipyards to disappear. In Europe, they were hanging around for a long time. The same could be said in Japan," Flynn said. "A lot of yards are not operating in China right now. And if a yard isn't operating for two years, it clearly will lose its workforce. But, stop and pause are two separate buttons on the remote." **NA**

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STX stumbles on road to super-stardom

Faltering orders and global economic decline have taken their toll on STX Dalian, until recently one of China's gold standard yards, Mark Vassel reports

The majority Korean-owned STX Shipbuilding (Dalian, [STX Dalian]), China's No 6 yard by orderbook, was another of the country's shipyards to make headlines this year for its deep financial problems.

Making matters worse, with the prospect that it will be sold to lessen the considerable debt problems accumulated by its parent, STX Offshore & Shipbuilding, the wholly owned Changxing Island-based yard had secured orders for just two ships this year, as of 21 July.

Seen as one of China's elite yards since its opening shortly before the collapse of Lehman Brothers in September 2008, it now faces the very real prospect that it, and its sister yards in Finland and France, will have new owners by the end of the year.

"Selling all of its stake in the Dalian shipyard is good for STX Group because the bulk of debt tied to STX Offshore is from that Chinese yard," Park Moo Hyun, an analyst at E*Trade Securities Korea in Seoul told Bloomberg in June. "Severing all ties should cut off that debt for STX Group."

An early frontrunner for the purchase, the Dalian government has since removed itself from the list of contenders, making the state-owned conglomerate that manages the country's northern yards, China Shipbuilding Industry Corp (CSIC), the buyer apparent.

In an intriguing twist, the CSIC is reportedly looking to move the Dalian Shipbuilding Industry Corp, the country's No. 3 yard by orderbook, away from its prime location on the city's downtown waterfront to STX Dalian's 5.5 million m² site on Changxing Island about an hour from Shanghai, according to Sinoship.

There has been no confirmation from either party; the STX Group did not respond to enquiries from *The Naval Architect*. But, a merger of STX Dalian and DSIC would rival Jiangsu Rongsheng and Shanghai Waigaoqiao for biggest shipyard in China in terms of contracted tonnage.



STX looks for ways to improve business for its Dalian yard

According to Clarksons, STX Dalian's book as of 21 July included 60 ships of an aggregate 3.94 million dwt; DSIC held an orderbook of 50 ships equivalent to 6.15 million dwt.

STX Dalian's massive site is divided into three main sections: shipbuilding, offshore, and a machinery and engineering plant. It primarily produces bulk and car carriers, tankers, containerships and floating production, storage and offloading units and other offshore structures.

It has four slipways ranging in size from 81,000 to 320,000dwt and a 320,000dwt drydock for offshore production.

Initially developed for prefabrication and block production to support the STX Group's network of yards, STX Dalian was the beneficiary of the type of rapid investment that brought the parent to its present perilous financial state, gaining in a few short years all stages of the ship-production process, including part processing, engine assembly, outfitting and testing. Production and conceptual design work is undertaken by the STX Group.

Adding to the uncertainty currently surrounding STX Dalian's future, 17 of the 60 ships now on its orderbook were contracted by STX Pan Ocean, the STX Group's merchant shipping arm that filed for court receivership in June after being unable to work out a deal with its creditors.

Those ships include a 400,000dwt ore carrier similar to the one's being built for Vale a Shanghai Waigaoqiao and a series of 10 56,000dwt open hatch bulkers, according to Clarkson.

If support from national interests could be adjudged to be weakening for Korea's STX Dalian, nothing could be less true for DSIC, which has 117 years of shipbuilding history.

As with Hudong Zhonghua, DSIC has benefited greatly from the Chinese state's recent entry into the global ship-leasing business; in July, the leasing arm of China International Marine Containers added to its growing list of box ships currently on DSIC's books (11 8,800 and 9,200TEU ships for foreign shipping lines).

In fact, DSIC's orderbook looks like a virtual 'who's who' of Chinese state shipping, with China Merchants, the China Shipping Group and the COSCO Group currently holding contracts for 15 ships, or 3.2 million dwt, between them.

If an FPSO on DSIC's books from the China National Offshore Oil Corp is included, more than 70% of its orderbook has been contracted by state interests. Singapore's Pacific International Lines and the Frederiksen Group are the other significant contributors.

In June, Frederiksen's Seadrill ordered two more 'hi-spec' jack-up drilling rigs at DSIC Offshore, bringing to eight the number of jack-ups it has on order there. The Norwegian company said the rigs are worth about US\$230 million per unit; two are scheduled for delivery this year, five in 2015 and the last in 2016.

DSIC Offshore has an independent 660,000m² yard with capacity to deliver about 10 offshore projects a year.

It can design and build tankers of up to 300,000dwt, containerships of up to 10,000TEU, bulkers up to 180,000dwt and VLOCs to 300,000dwt at its main commercial yard.

Its wholly owned associate, the Dalian Ship Research and Design Institute, has been developing designs for large LNG ships since 2009, but the yard has yet to sign a contract that would break Hudong Zhonghua's monopoly over that sector. **NA**

MPP specialist catches the eye

As a comparatively small yard in the global shipbuilding market Zhejiang Ouhua Shipbuilding often slips under the radar. However, Mark Vassel reports that as an MPP builder the yard is fast gaining a reputation for quality that negates the need for scale

Known since its first delivery in 2006 as a competent builder of small to medium-sized containerships, Zhejiang Ouhua Shipbuilding has recently built a reputation as a specialist in multi-purpose vessels.

With 34 ships totalling 1.22 million dwt under contract as of 22 July, the yard's orderbook ranked No 14 in China, according to Clarkson. But, despite its modest status on the national scale, it continued to catch the eye of demanding foreign buyers in Greece, Singapore and Germany.

In March, China Navigation, the deepsea shipping arm of the multinational Swire Group, returned to Zhejiang Ouhua to buy four 22,000dwt multi-purpose vessels (MPP), bringing to 10 the number of ships it has on order at the yard.

According to fleet director, Martin Cresswell, China Navigation chose to build at the yard because of the accuracy of its design and construction methods resulting in fit-for-purpose ships at a competitive price and with attractive delivery packages.

"[Zhejiang Ouhua] are experienced MPP shipbuilders and use the Neptun Ship Design, Rostock, to design all ships built at the shipyard. Neptun is a very experienced German ship designer which specialises in MPPs and containerships," Cresswell says. "The ships are designed in 3D Tribon, producing very good accuracy, and shipowners and the yard can be fully involved in the design. This has been proved in practice, as the design is excellent."

3D Tribon is a software programme designed specifically for naval architecture.

Singapore-based China Navigation also has six of eight 31,000dwt MPPs originally ordered in December 2010 still on the books at the yard.

For a relatively new yard, Zhejiang Ouhua has built its reputation with foreign owners quickly, and expanded to keep pace with demand. In early 2011, it purchased the nearby Zhejiang Dexing Shipyard, adding a 100,000dwt outfitting quay, a 100,000dwt dry dock, a manufacturing plant and other infrastructure.

The purchase increased its shipyard area to 1.4 million square metres, but it didn't come without visible growing pains.

In July, Zhejiang Ouhua had to cut by 25% (or almost US\$8 million) the price of two Kamsarmax bulk carriers ordered by subsidiaries of Hellenic Carriers to appease the Greek owner after delivery delays.

The cause of those delays was attributed to "expansion of the shipyard and taking over the adjacent facilities of a non-functioning yard", according to a broker who spoke to Lloyd's List. Zhejiang Ouhua declined to comment.

Zhejiang Ouhua has also benefited from the close relationships between Chinese financial institutions and Greek shipowners, who have tapped the yard for a number of 4,600TEU container ships, adding to the 10 1,700TEU boxships it has contracted from Greek and German owners.

It is expected to set a company record for output this year, when almost 1 million dwt is scheduled for delivery from the yard. **NA**

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Speedy delivery and cheap prices are no longer enough

Chinese private shipyards have to build their own brands and be able to deliver unique products and services, says Sinopacific. Sandra Tsui reports

China's shipbuilding industry has become known in the market for its competitive pricing and fast delivery times. But, since the global banking crisis hit the shipbuilding industry, hitting demand and vastly intensifying competition for new ship orders and the emergence of new competition, this is no longer enough says one of China's more successful yards, Sinopacific.

Yards in China need to establish their own identity and create a customer base that is loyal to the yard.

"Nowadays, shipyards can no longer rely on speedy delivery and cheap prices to win, we have to be able to provide unique, value-added services and establish our own brands to gain market recognition to survive, especially in the emerging offshore market, such as Africa, North America and Russia," says Simon Liang, chairman and CEO of Sinopacific Shipbuilding Group.

Sinopacific is one of the few private shipbuilders in China that has its own R&D unit. The shipyard has chosen to focus on the R&D of offshore service vessels and mid- to large-sized bulk carriers.

For offshore vessels, Liang says the focus is on safety. He stresses that a balance between safety, environmental friendliness, cost-effectiveness and comfortableness must be struck.



JS Amazon designed for a green future

When developing a new bulk carrier, being economical is the most important consideration, according to Liang. The three factors to evaluate whether a cargo ship is economical are: ship speed, main engine fuel consumption and cargo capacity. A good design of bulk carrier also has to match the latest IMO regulations and standards and take into account latest market trends, such as the Panama Canal's expansion, he adds.

The shipyard's most popular bulk ship model, CROWN 63, is a product designed with all these factors taken into account, Liang says.

The 63,500dwt bulk carrier, of which the first vessel was delivered in February 2012, has helped the yard bag new orders of nearly 30 ships from Greek, Turkish, British, Singaporean and Norwegian shipowners since February 2013.

CROWN 63 was developed on the basis of the CROWN 58, a 58,000dwt bulk carrier also designed by Sinopacific. Under the same speed, the loading capacity of CROWN 63 is 9% higher than the CROWN 58, but its fuel consumption is 13% less. The daily fuel consumption of the CROWN 63 designs is around 25.75tonnes, much lower than the daily fuel consumption of 30.4tonnes of CROWN 58.

In order to raise the cargo capacity of CROWN 63, its ship length is 10% longer than CROWN 58 and its depth 0.5m deeper and its scantling draught higher. These changes have introduced challenges for the structural design. Meanwhile, in order to maintain the CROWN 63's deadweight, its light ship weight per metre was reduced.

The energy saving function of the CROWN 63 is mainly achieved by its hull lines and propulsion system design. Using a main engine with a lower rotating speed allows the application of a propeller with larger diameter. The rudder bulb also has been adjusted to match the propeller hub fairing.

With the application of low sulphur fuel system, CROWN 63 is able to lower the level of its sulphide emission. CROWN 63 has also reserved an interface and space for future installation of ballast water treatment system.

Meanwhile, CROWN 63 has already been granted Clean Ship classification, it can also fulfil the requirements of Green Passport under the Hong Kong Convention.

Sinopacific, with two shipbuilding bases in east China's Zhejiang and Yangzhou, is able to complete 24-30 offshore support vessels and 30 bulk carriers a year. The yard has delivered 319 ships so far by May 2013 and its turnover of 2012 exceeded US\$1.4 billion. **NA**

TECHNICAL PARTICULARS

CROWN 63,500 DWT BULK CARRIER

Length oa:	199.99m
Length bp:	193.74m
Beam:	32.26m
Depth:	18.50m
Designed / scantling Draft:.....	11.30/13.30m
CAPACITIES & DEADWEIGHT	
Cargo holds (grain):.....	77,500m ³
Deadweight:	63,500dwt
SERVICE SPEED & FUEL CONSUMPTION	
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Hudong Zhonghua is putting on The Ritz

Hudong Zhonghua Shipbuilding, a key member of the China State Shipbuilding Corp's (CSSC) stable of southern yards, is the poster child for China's strategy to produce high-value ships, writes Mark Vassel

With orders equal to 3.3 million dwt on its books as of 16 July, it ranked seventh among Chinese shipyards in terms of raw tonnage. But, if its orderbook is measured in compensated gross tonnes, which considers the labour-intensity involved in building a specific merchant ship, it ranked second, according to a July edition of Clarkson's *China Shipbuilding Weekly*.

High-value and specialty ships dominate its orderbook, ostensibly making it less vulnerable to the pricing pressures currently threatening the profitability of its domestic rivals.

Hudong Zhonghua has long been the preferred yard of China's ruling elite, a position and privilege that has historically put it at the front of the line to build domestic and foreign naval vessels and, more recently, the country's LNG ship programme.

A recent example arose in April when Hudong Zhonghua again trumped domestic competitors to land a prestigious order for six 174,000m³ dual-fuelled gas-ships from a consortium led by the China Shipping Group.

They were the largest of their kind ordered in China and the deal protected Hudong Zhonghua's domestic monopoly for building such ships despite reportedly fierce competition from wannabe debutants Dalian Shipbuilding Industry, Nantong COSCO KHI Ship Engineering and China Rongsheng Heavy Industries, according to local reports.

The selection of dual-fuel diesel-electric propulsion for the ships marked a turning point in China's LNG construction programme, which had been restricted to steam turbine or two-stroke engines for propulsion of the big LNG ships. Electrical propulsion technology is more efficient and more in line with emerging IMO and regional environmental legislation due to its lower fuel consumption and carbon emissions.



Hudong Zhonghua sees its orderbook increase in 2013

They are fitted with medium-speed MAN B&W dual-fuel diesel engines and GTT designed NO96 type LNG containment systems.

The order marked the third significant series of LNG ships being built at Hudong Zhonghua, following its inaugural 147,000m³ series, which met with longer than expected construction delays.

Most analysts agree that Hudong Zhonghua has yet to build one of these ships profitably, with its foreign partners having to share the cost overruns. And, with China mandating that half its energy demand be delivered on Chinese built ships, buyers also will share its technological growing pains.

However, Hudong Zhonghua's LNG monopoly can't last forever, according to a recent White Paper from Sinoship.

"By 2020, China will need up to 60 new liquefied natural gas carriers worth about US\$12 billion to meet the energy goals set out in the 12th Five-Year plan, [requiring] ... a minimum of four Chinese shipyards building these high-spec vessels in the coming years," it said.

For merchant ships, Hudong Zhonghua has a diverse orderbook of 43 ships equally contracted by foreign and domestic buyers, boasting large containerships (above 8,000TEU), 10 LNG ships, chemical tankers, multi-purpose heavy lift vessels, ro-ro / containerships and medium-sized bulkers.

In the past, it has also built LPG carriers, floating production and storage units for the offshore industry and crude

oil tankers, in addition to naval frigates and various amphibious landing ships.

With its state support, that technical diversity is expected to continue to grow.

According to Rodskog Shipbrokers, China's powerful Ministry of Industry and Information Technology in February mastered the core design and construction technology for 8,000-unit car carriers.

It instructed the Shanghai Merchant Ship Design & Research Institute (SDARI) to work with Hudong Zhonghua and Xiamen Shipbuilding to develop domestic production capability for the 13-deck behemoths. SDARI believes the project is an opportunity to improve its design capability and lay the foundation for a 10,000-unit PCTC design, in which Hudong Zhonghua undoubtedly will play a part.

In January, the CSSC asked management at Hudong Zhonghua to take a controlling interest in Shanghai Jiangnan Changxing Shipbuilding as part of a group-wide yard rationalisation. The move alleviated Hudong's capacity constraints and gave Shanghai Jiangnan Changxing, which currently has 10 ships on its books, access to resources and capital.

China Shipping's 174,000m³ LNG ships are being built at Jiangnan Changxing's No. 1 dock. Combined, the yards have an output capacity estimated at 5 million dwt.

Before the Jiangnan acquisition, the Hudong Zhonghua group controlled the Hudong and Zhonghua shipyards, Hudong Heavy Machinery, Dong Ting Steel Structure and almost 100 other marine equipment manufacturers and sub-companies.

It offered a VLCC dry dock (300,000dwt), a 120,000dwt class floating dock and five shipbuilding berths for the construction of ships ranging from 20,000 to 120,000dwt. **NA**



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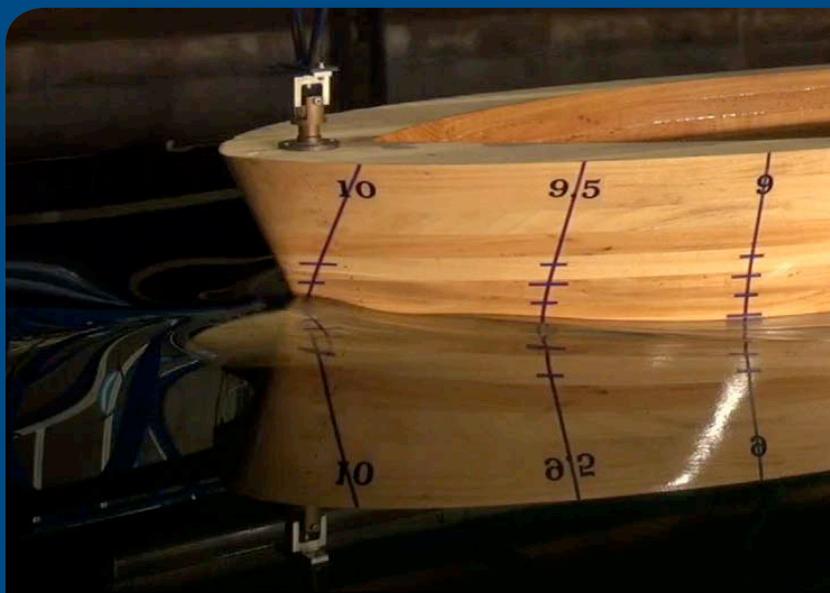
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Hard analysis favours Rongsheng

Financial flaws will not undermine China's most innovative yard with a diverse orderbook that is the envy of China's shipbuilding industry, writes Mark Vassel

It would be understandable if management at Jiangsu Rongsheng Shipbuilding Co, located about an hour's drive from Nantong on the Yangtze River, felt their organisation had been in the industry spotlight this year for the wrong reasons.

Extensive publicity about the substantial cash flow problems of the company and its Hong Kong-listed parent spurred recent media reports that the government may allow the shipyard with the biggest orderbook in China to be the "largest casualty" in a country that has too much building capacity.

However, more sober analyses quickly arose to cut short the speculation.

"Rongsheng is a flagship in the industry," UOB Kay Hian analyst Lawrence Li told Reuters. "The government will definitely provide assistance if firms like this are in trouble."

Rongsheng has reported government subsidies of RMB3.38 billion (US\$550.77 million) from 2010-12, but it recently warned that, in future, state support is far from assured.

All the focus on its financial challenges has diverted attention away from a construction programme that historically has been at the centre of China's shipbuilding success story.

The yard emerged in 2004 and had delivered its first ship by 2007; 18 more followed by the end of 2009.

As of 10 July this year, it had 10.6 million dwt in confirmed orders on its books, equally balanced between domestic and foreign buyers, according to Clarkson Shipping Intelligence Network.

The jewels in Rongsheng's present shipbuilding crown are certainly the remaining orders for Vale's 400,000dwt 'Valemax' ore carriers. But, closer inspection of the book reveals a



Could the largest be the first to fall?

product diversity that would be the envy of most yards in China.

Its commercial focus is said to be on capesize and Suezmax tankers, VLCCs, containerships (above 5,000TEU) and the ore carriers, and the predominant vessel type in its present book is evenly split between bulk (26 units) and boxships (30 units).

Rongsheng also has 23 orders for 157,000dwt tankers from elite owners in Greece, Turkey and market-movers such as Norway's Fredriksen Group, as well as two orders for 320,000dwt tankers from state-owned interests in India.

Notwithstanding its present financial woes, a reputation with owners for three reliable streams of vessel production would appear to protect it against the demand fluctuations of a dedication to individual commercial shipping sectors.

Designs for its vessels originate from Europe and Korean Maritime Consultants, who partnered with the China Ocean Shipping Group to create COSCO-KOMAC and offer design and construction support to yards in China.

Rongsheng also offers designs from two domestic houses: the Shanghai Merchant Ship Design & Research Institute and the Marine Design & Research Institute of China, both of which have played large parts in the

rise of China's shipbuilding industry.

It currently has orders for 76,000 and 205,000dwt bulkers, aside from the 400,000dwt ore carriers; 6,588, 6,600 and 7,019TEU containerships; 157,000 and 320,000dwt tankers and a 75,000dwt shuttle tanker for Shanghai North Sea, according to Clarkson.

It is one of the elite shipyards in China in terms of the infrastructure it has at its disposal, with a potential annual production capacity for offshore and marine projects estimated at 8 million dwt.

In 2008, management put three docks into operation, each equipped with two 900tonne gantry cranes. That was followed in 2010 with Dock No. 4 (139.5m x 580m), which was equipped with a 1,600tonne gantry crane.

The company also owns eight 300,000dwt outfitting quays.

The first phase of its construction saw Rongsheng offer more than 2.4 million m² of shipyard area; phase two calls for a further 4.2 million m² to come on stream.

In a sign of its determination to become a player in constructing fixed and floating assets for the offshore industry, in 2011 it started an offshore division for building floating production, storage and offloading units, as well as jack-up rigs and other offshore products.

As with many yards in China, Rongsheng's orderbook is showing some strain from the present shipbuilding recession: it only has seven ships on its books for delivery after next year (2014).

It won orders for just US\$55.6 million worth of vessels in 2012, a year when it told the market it was targeting sales of US\$1.8 billion. **NA**

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CSBC Taiwan dances with the market

In launching its Panamax conversion solution ahead of the completion of the Panama Canal expansion those in the commercial world know that being flexible is critical to a businesses' success, but not all can deliver. Containership expert CSBC Corporation, Taiwan shares with *The Naval Architect* its unique way of adapting to the evolving shipbuilding market, Sandra Tsui reports

TRANBO (TRANsformer JumBO), a patent pending product that converts Panamax container vessels to fit the new Panama Canal dimensions, has been launched by the Taiwanese shipyard.

In the past, the ship breadth of Panamax container vessels was constricted by the size of the Panama Canal's locks. Therefore, Panamax boxships are in general less stable and require more ballast water. The expansion of the Panama Canal is expected to be completed in 2015. At the moment, less than 30% of the containerships in operations are Panamaxes, a majority of which are new models. If they cannot be upgraded in terms of operational and loading efficiency, they may be ousted, Tsai Kun-Tsung, director of sales department at CSBC Corporation, Taiwan explains.

"One of our core strategies is to improve our technological capability to match the latest and future needs of shipowners," says Tsai.

TRANBO converts existing Panamax containerships by widening its ship breadth through adding sponsons that extend underneath the waterline to the two sides



Diagram 2: TRANBO increase homogenous load by 40-50%

of the main ship body. This can enhance the stability of the ship, reduce the required volume of ballast water and increase the cargo capacity of the ship; and ultimately lower the per unit operation cost. The design of TRANBO is also in line with the

current trend of lower operational speed. (Diagrams 1 and 2).

After the conversion, the stability of Panamax containerships can be improved greatly and their cargo capacity can also be raised by up to 50%. According to ship model test results, even if the speed is lowered by two to three knots, the ship's manoeuvrability can satisfy operational requirements. The Energy Efficiency Operational Indicator (EEOI) of the ships can also be lowered by 20%.

The time needed for the conversion is around one to two months; the yard is negotiating with a few shipowners regarding design and procedures, while they expect more and more interest will follow in the coming years.

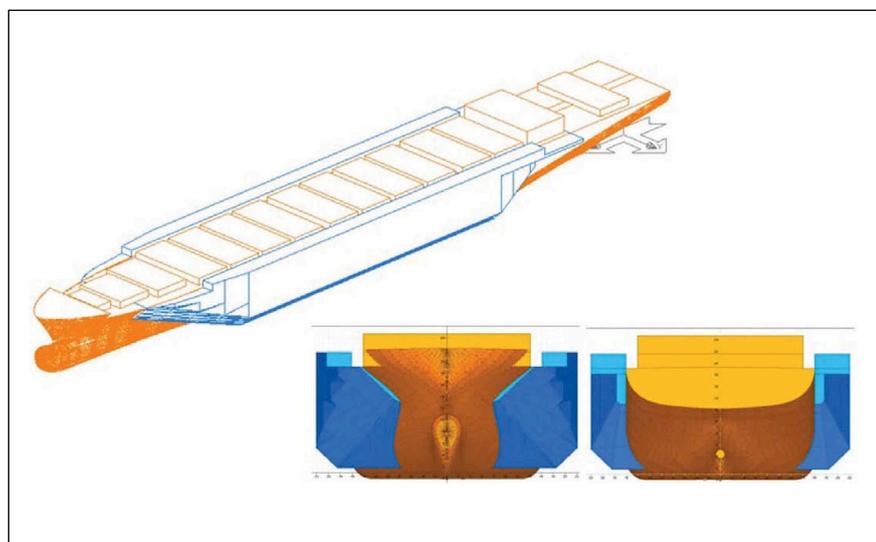
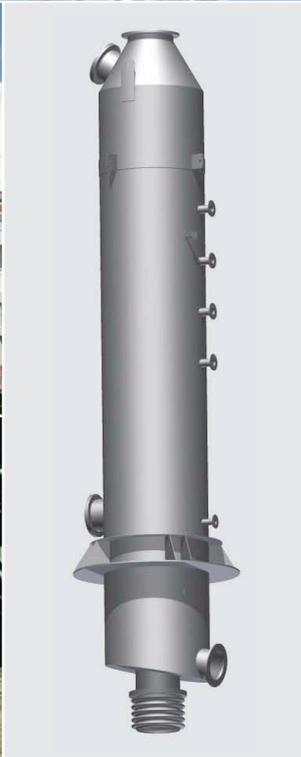


Diagram 1: TRANBO converts the existing Panamax containerships by widening its ship breadth through adding sponson on the sides



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Diagram 3: The shape of ES Bow

Apart from TRANBO, CSBC Corporation, Taiwan has started other initiatives to match future market needs. In the “Shipping 2020” seminar held in Taipei in March 2013, DNV and CSBC Corporation, Taiwan – the two organisers of the event – shared their views on the operational model of the world’s fleet in year 2020 and held in-depth discussions with participants on a wide range of issues of concerning future energy-saving technologies.

CSBC Corporation, Taiwan expects to see stricter regulations on environmental protection, which will encourage the application of energy saving technologies. The shipbuilder also forecasts that dual-fuel vessels will become more popular.

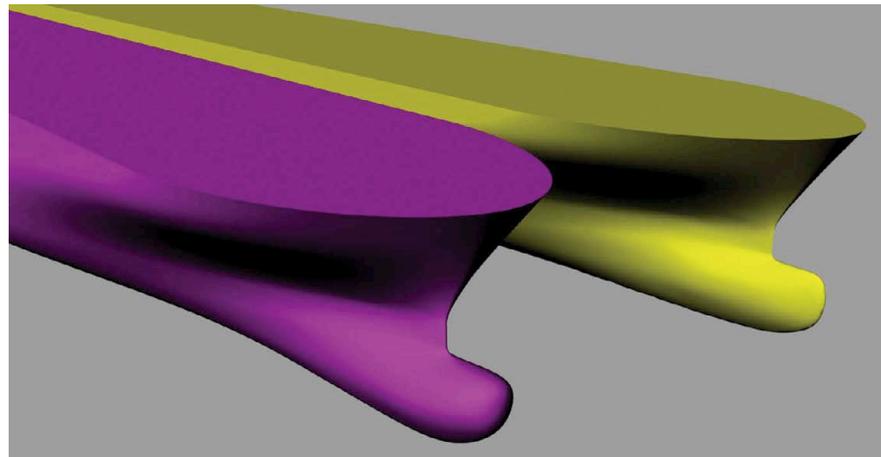
“Natural gas price is falling in the long run, narrowing the gap between prices of oil and natural gas. Also, there have been not enough LNG refill facilities at ports, but now major ports in Singapore, mainland China and Europe are building LNG refill stations to meet the growing need,” says Tsai.

Another trend expected by CSBC Corporation, Taiwan is that more container lines will operate in alliances in order to better organise their resources through cooperation.

To address these projections of future market changes, CSBC Corporation, Taiwan is on the one hand boosting its R&D efforts towards specific directions, and on the other hand looking to diversify its product portfolio.

“Container vessels make up around 90% of our sales now, and we aim to lower that proportion to 80% by 2018 and diversify into the building of non-cargo ships, such as offshore support vessels, as well as wind turbine installation vessels, which is partly to match the Taiwan government’s policy of promoting green energy,” Tsai notes.

“We will also shift our research efforts to the reduction of carbon emissions and the design of dual-fuel vessels,” Tsai adds. “Meanwhile, we are promoting the application of our own exclusive research results on energy saving technologies, such as our Energy Saving Bow (ES Bow), Energy



Saving Sea Sword Bow (ES SSB) and other energy saving devices.”

Since 2010, CSBC has helped shipowners to refine the design of ship bows to save energy according to their operation model and ballast water requirements. (Graph 3).

According to operational statistics from shipowners, CSBC’s ES Bow can help save fuel by about 8-10% for 8,000 and 4,600TEU class container vessels, when the ship’s speed is reduced from 24-25knots to 17-18knots. Shipowners can usually see their investment on applying ES bow returned in one to two years, according to CSBC. A few shipowners are negotiating with the corporation regarding the application of ES bows on their ships at the moment and will complete the retrofit before the end of 2013 in some cases.

CSBC has also developed the design of

the Energy Saving Sea Sword Bow (ES SSB), and has tested the design with ship model tests this year, (Graph 4). Test results showed that the ES SSB’s reduced resistance level in seaway is better than the traditional bulbous bow and the speed loss of ES SSB is also relatively lower, leading to lower fuel consumption.

This design has been applied to CSBC’s fourth generation Super ES 1,800TEU boxship model, which was launched in the third quarter of 2012. The shipyard has already received an order for four Super ES with an option for four more vessels from Chinese shipowner SITC International Holdings Company Limited in April 2013. The first four ships are scheduled to be delivered between the fourth quarter of 2014 and the first quarter of 2015.



Diagram 4: The shape of ES Sea-Sword Bow

In the second quarter of 2013, CSBC Corporation, Taiwan also launched its new 2,400TEU Bangkokmax containership model, on which the ES SSB is applied to reduce speed loss and green water impact.

The shipyard has also increased the ship breadth to 32.2m in order to enhance the vessel's stability and allow the ship to carry 34% more laden containers than other vessels in the same class. The ship model tests of this new Bangkokmax model will be carried out at HSPA around the end of 2013. It is estimated that its Energy Efficiency Design Index (EEDI) could be as much as 30% lower than the international standard, and it will, therefore, meet the highest standards that will become effective from 2025.

Wide beam Panamax boxship

On top of the TRANBO, CSBC has also launched a new design for a 5,000TEU Panamax container vessel in the first quarter of 2013 in preparation for the new

	Kaohsiung	Keelung
Total Area of Premises	1173051 sq. m	355866 sq. m
Building Dock	950m x 92m x 14m	275m x 45m x10m
Repair Dock	275m x 45m x 12m	210m x 26.4m x 12.4m
		270m x 45m 11.5m
Length of Waterfront	1800 m	1098 m
Crane Capacity	350 tons x 2 sets	150 tons x 1 set

Table 1: Capacity of the two shipbuilding bases of CSBC Corporation, Taiwan in Kaohsiung and Keelung

Panama Canal. The new design has also taken into consideration the requirements of pendulum routes for emerging countries, the north-south American routes and Intra-Asia routes.

A "wide beam" design is applied on the new Panamax model, which allows the ship to carry less ballast water and maximise the ship's laden container capacity; thereby reducing the unit cost of transportation and avoiding the effects of overcapacity

through the cascade effect of vessels from other trades. The new model also has a super-shallow draught to suit the ports of emerging countries.

CSBC Corporation, Taiwan has two shipbuilding bases, one in south Taiwan port city Kaohsiung and one in north Taiwan's Keelung. The shipbuilder is able build 14-16 cargo ships a year, of which nine to 10 mid-to large-sized vessels and four to six smaller cargo ships are included. (Table 1). *NA*



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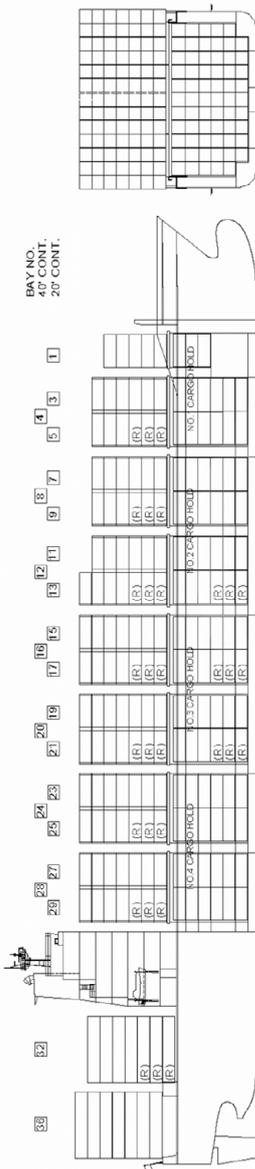
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New Bangkokmax model

TECHNICAL PARTICULARS

CSBC 2,400 TEU container vessel

Length overall	abt. 172.00m
Length between Perpendiculars	162.10m
Breadth (moulded)	32.20m
Depth (moulded)	16.40m
Design draft (moulded)	8.80m
Scantling draft (moulded)	9.70m
Deadweight at scantling draft	abt. 24,900tonnes
Tonnage	
GT	abt. 23,400
Speed	
Service speed NOR with 15%SM at design draft	abt. 18.8kn



TECHNICAL PARTICULARS

CSBC 5,000 TEU container vessel

Length overall	abt. 244.60m
Length between Perpendiculars	232.50m
Breadth (moulded)	42.00m
Depth (moulded)	22.00m
Design draft (moulded)	11.50m
Scantling draft (moulded)	12.50m
Deadweight at scantling draft	abt. 60,000tonnes
Tonnage	
GT	abt. 55,700
Speed	
Service speed NOR with 15%SM at design draft	abt. 21.5kn





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Jiangsu New's elite yard evolution

The first half of 2013 may have been a period of retrenchment for many of China's big shipyards, but at Jiangsu New Yangzijiang Shipbuilding (Jiangsu New) it was a time of growth

Part of the growing stable of shipbuilding companies under its publicly traded parent, Jiangsu Yangzijiang Shipbuilding (Holdings), Jiangsu New entered China's top five shipbuilders in the first half of the year in terms of contracted tonnage.

The company has secured orders for 27 new ships – worth just over US\$1 billion – and with the benchmark Baltic Dry Index posting a 52-week high in July, it said it was confident that many of the options owners held for bulk carriers (combined estimated value of US\$1.08 billion) would be converted.

All in, Jiangsu New has 51 options outstanding in July worth about US\$2.6 billion, according to Seatrade Global.

As of 13 July, its orderbook boasted a healthy 59 ships, or 4.3 million dwt, fairly evenly split between bulk and container ships, according to Clarksons. It also has four 70,000dwt woodchip carriers, due for delivery this year and

next, part of a six-unit order placed by an arm of Singapore's Asia Pacific Resources International Ltd (APRIL). The ships have been hailed as the largest of their kind.

After receiving the first unit in March, Indonesian tycoon Sukanto Tonato, founder and chairman of APRIL's parent, RGE, said they would "greatly enhance [APRIL's] capacity to import raw materials, and help Rizhao port in Shandong to be the largest woodchip transport port in China".

The first-half ordering surge at Jiangsu New appeared to put the parent company in a confident mood. In April, it announced the US\$17.6 million (RMB110 million) purchase of the remaining 49% of Jiangsu Yangzi Changbo Shipbuilding not already owned by the group. It took control of the yard in 2011.

The group had been splitting its merchant shipbuilding activities between its old facility Jiangsu Yanzijiang Shipyard

in Jiangyin city on the south bank of Yangtze River 50 miles east of Shanghai, and Jiangsu New, on the south bank near the city of Jingjiang. The two cities are connected by a bridge.

It is thought that the acquisition would hasten the group's transfer of its current construction activities from the old yard to Changbo, as per the wishes of the local government.

Two orders in the past few years have highlighted the yard for foreign buyers.

For years, the group was known as competent builders of small and medium-sized bulk and container ships. But, in June 2011, it entered a more elite league of shipbuilders when Seaspan International agreed to build seven 10,000TEU containerships at Jiangsu New for a reported US\$98 million per unit; perhaps reflecting the dour market conditions, Seaspan ordered four more this January at the reduced rate of US\$90 million per unit.

Jiangsu New has split its workload between its two locations



According to Seaspan, the Yangzijiang Shipbuilding Group has an excellent reputation and track record in building container ships.

"[Jiangsu New] joined us and MARIC to develop the 10,000TEU, fuel-efficient 'Saver' design. Compared with current 10,000TEU container vessels presently in operation or being built, the new design features have led to substantial improvements," a Seaspan spokesman said. "The cargo capacity has increased by 10%, while fuel consumption has been reduced by 20%. The new hull design allows the vessels to carry minimum amounts of ballast water while in operation ... and they are designed to reduce the emissions to air by approximately 20% to meet future regulatory emission requirements."

In what would be an impressive feat, all 11 ships are to be delivered next year, according to Clarkson's Shipping Intelligence Network.

In December, the parent turned heads again when its 78%-owned Jiangsu Yangzijiang Offshore Engineering Co (YZJ Offshore) made the group's first foray into offshore construction by signing a US\$170 million contract with Malaysia's Mena Offshore Investments to build a jack-up rig.

In a statement to the Singapore exchange, its indirect minority partner in YZJ Offshore, Creon Resources, laid bare the extent of the company's ambitions in the energy sector.

"The directors believe demand for newly designed rigs will be underpinned by the phasing out of the existing stock of rigs over the next few years ... [and] consider that, based on the current stock and new rig builds in the pipeline, there could be an under supply of almost 200 jack-up rigs by 2020, given that almost half the current fleet are more than 30 years old," it said. "Both Creon and Yangzijiang believe the requirement to provide higher specification rigs to enable even deeper and more efficient drilling represents an excellent investment opportunity."

The Le Tourneau Super 116E Class self-elevating mobile offshore rig, classed by the American Bureau of Shipping, is scheduled for delivery in 2Q 2015. The order included an option.

In July 2012, YZJ Offshore secured the land rights to approximately 1.6 million

m³ of land in Taicang, some 50 miles north of Shanghai, where the group is building another yard dedicated to the construction of offshore assets, including Mena's jack-up rig.

In its more traditional commercial theatre, the group offers newbuilding, re-fit, repair and ship-breaking services for merchant ships of up to 100,000dwt. The older production facilities focus on smaller ship types on three slipways with maximum capacity of 50,000dwt (for

example, it currently has 14 containerships under that size on its books).

Jiangsu New features a drydock able to simultaneously build to 100,000dwt vessels, in addition to a supporting outbuilding berth.

Design services, both concept and production, are provided by its affiliate, the Hengao Design Institute.

According to Clarkson, it is scheduled to achieve an output of 2.08 million dwt this year, its busiest ever. *NA*

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Plain sailing for SWS

Shanghai Waigaoqiao Shipbuilding (Waigaoqiao) has comfortably sailed through the turbulence felt by many yards in China this year, buoyed by a surge in bulk ordering, a growing product portfolio and timely support from state shipowners, Mark Vassel reports

One of the China State Shipbuilding Corp's (CSSC) stable of elite southern shipyards located near Shanghai, Waigaoqiao capitalised on the first-half buying spree of new 'eco' ships to secure contracts for 31 new ships (23 bulk carriers) so far this year.

Many of China's top yards are promoting design enhancements that can improve bunker fuel consumption by as much as 40% over the previous classes of ships, ostensibly saving owners money, making the ships easier to charter and more in line with emerging environmental legislation and regulations.

Norway's market-leading Frederiksen Group alone agreed to buy 12 such Capesize bulkers while prices for that type of ship were at or near historic lows.

In fact, Taiwan's Sincere Shipping was reported in April to have paid a record low of US\$46.8 million per unit for two similarly sized ships at Waigaoqiao.

Sincere's deputy general manager Li Yiren reportedly said that the prices were too good to ignore, even when the sector was suffering from rampant overcapacity.

"Frankly, ordering newbuildings now is not a good thing for the market in general," Li said. "But, the price is really low. Buying new vessels at this price can improve our long-run returns and make us more competitive."

For Waigaoqiao, two orders and a 'letter of intent' have stood out so far in 2013. First and foremost, in July, its parent, the CSSC Group, stunned the industry by announcing that its Hong Kong-registered leasing arm had agreed to build three 16,000TEU containerships at the yard.

Despite its impressive history, Waigaoqiao has never built a containership; in fact, the largest boxship ever built in China is 10,000TEU, so more than a few industry observers were astonished by the deal.



Shanghai Waigaoqiao shipbuilding develops eco designs

The parent clearly saw this as an opportunity to prop up one of its elite yards during a market downturn while further establishing its leasing company, CSSC (Hong Kong) Shipping, as a market player.

The other, less dramatic order, saw Waigaoqiao's offshore subsidiary, SWS Offshore, secured the yard's first order for platform supply vessels (PSV), further establishing its credential in offshore construction.

However, of all the contracts and agreements Waigaoqiao has signed this year, none ultimately may prove to be more influential than the letter of intent it signed in April with the Greek tycoon George Economou's Cardiff Marine.

Simply called an 'offshore project' (a firm contract is expected before year end); few details have been made available by either signatory. But, the LOI was said to have been influential in CSSC's ability to secure the RMB260 billion (US\$42.36 billion) credit line it signed in May with a consortium of state-owned banks.

The massive credit facility, one third larger than the group's total asset value, would be used to "enhance our core business and help us diversify into other areas", the CSSC said.

It has, in the past, delivered offshore platforms and floating production,

storage and offloading units – Prospector Offshore Drilling in July extended its option with Waigaoqiao to buy a third semi-submersible drilling unit until the end of the year. And Waigaoqiao is seen as one of few Chinese yards with the resources to build high-specification rigs.

But, like many yards in China, offshore work has failed to make a significant contribution to its bottom line.

Promising new sectors aside, Waigaoqiao's orderbook remains dominated by bulk carriers; of the 59 ships secured, 46 are bulkers, ranging in size from 76,000dwt to 320,000dwt.

As of 15 July Waigaoqiao had a cumulative 10.73 million dwt of merchant ships on its books, a volume that had it virtually level pegging with Rongsheng for the biggest orderbook in China by tonnage, according to Clarkson.

The shipyard, established in 1999, has four production centres for steel-cutting and fabrication, flat panel assembly, curved panel assembly, and blasting and painting, reportedly allowing work on up to 15 ships simultaneously.

It offers prospective buyers more than 3-million square metres of shipyard area and is expected to set a company record this year for merchant tonnage output as the last orders from the boom years slide down its slipways. **NA**

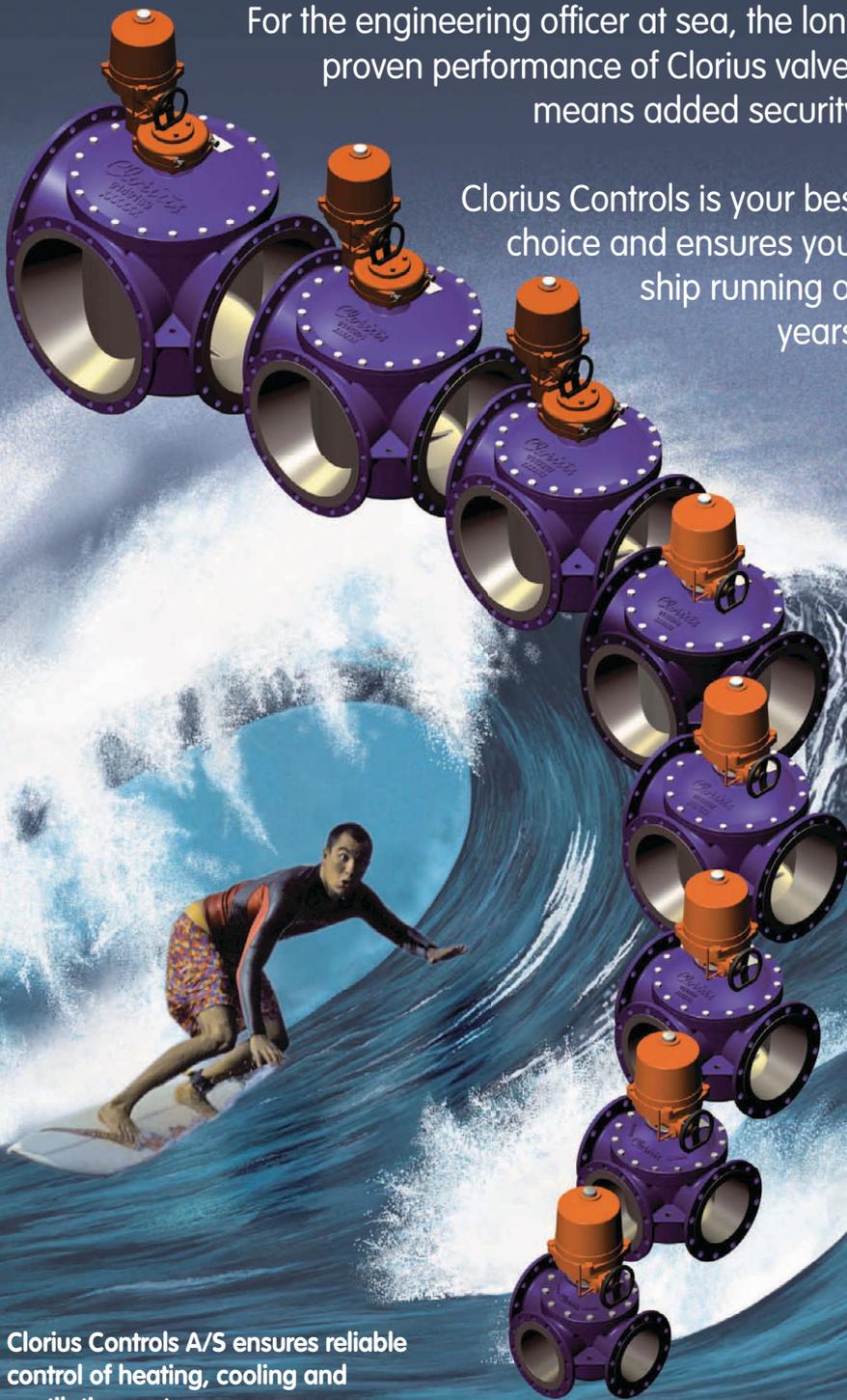
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Emissions remain top of regulatory agenda

Environmental regulations have dominated the regulatory scene over the last 10-years or more. However, the increasing complexity of the legislation and implementation mean that designers and owners must keep abreast of changes. *Sandra Speares* explains the latest changes to green rules

Emissions and ballast are just two of the issues on the IMO regulatory agenda this year, with moves from the EC on ship recycling and monitoring emissions from ships while Canada recently announced plans to join the North American emission control area (ECA).

Question marks remain over the date for implementation of NOx Tier III proposals, which may be deferred from 1 January 2016 to 1 January 2021, with the matter to be considered at the Marine Environment Protection Committee (MEPC) meeting next year, this deferral is by no means a “done deal” according to David Tongue, director of regulatory affairs at the International Chamber of Shipping. “I wouldn’t put money on it”.

MEPC65, which took place in May this year, had among other things to consider a report by a Correspondence Group set up to review whether the necessary technology was in place to be able to meet the 2016 deadline.

Commenting on the group’s review, the Russian Federation made a submission raising doubts about the availability of technologies to meet the requirements of a 2016 implementation, suggesting that most of the review concentrated on the use of selective catalytic reduction. The submission warned that one of the drawbacks of SCR technology “is the risk of ammonia, a gas no less toxic than NOx, appearing in the exhaust system when the diesel engine is working in variable load regime, due to the catalyst inertia.

“The system is reliable only within the narrow temperature range (250-400°C). Furthermore, where NOx is neutralised with urea, emissions of greenhouse gas (CO₂) increase in the quantities approximately to those of the neutralised nitrogen oxides. If greenhouse gases are to be taken into account that are emitted into the air from the whole operational cycle



Jacqueline Tan, UK P & I club backs shipowners concerns about the BWMC

of neutralisation plants and urea, the SCR technology may become a factor seriously contributing to greenhouse emissions from shipping.”

Costs to install an SCR system on a 20,000dwt ship, Russia put at €6 million (US\$7.96 million), and the federation gave its opinion that the implementation date for the NOx regulation should be put back five years, to allow a further review of available technology.

According to David Tongue, delegates were split into one camp that believed the concerns were valid and a delay was necessary, while other suggested that there was still time to address the concerns there should be not delay in implementation. A third group reserved their position, but the issue needs to be decided by a two-thirds majority.

The IMO’s Tier III restrictions require the approximate 74% reduction in NOx emissions when compared to Tier II-type

engines. Permissible NOx emissions under Tier III are restricted to between 3.4g/kWh and 2.0g/kWh, depending on an engine’s rated speed.

Tier III and how to address it are also themes high on the agenda for exhibitors at this year’s Europort trade fair in November. “We have developed a ‘Green Route’ specifically to guide exhibition visitors through the companies recognised for the technologies they have developed to meet environmental concerns,” says Raymond Siliakus, Europort Exhibition manager. “Visitors to Europort 2013 need to be able to look beyond the buzzwords and explore the real progress the technical innovators are making to meet and exceed emissions regulations,” he says.

GE Marine, for example, will be showcasing its 12V250 marine diesel engine. The company recently confirmed the 12V250 as its first marine engine meeting both US Environmental



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Protection Agency Tier 4i and IMO Tier III in-engine emissions requirements without the need for exhaust gas after-treatment. GE is now able to offer its L250 and V250 medium-speed marine diesel engines (1,550 – 4,650kW) without a SCR.

“This new technology allows the marine industry to meet the upcoming emission compliance requirements and reduce both capital and operating expenditures.” says John Manison, general manager of GE Marine.

In addition to meeting emissions compliance, the GE 12V250 MDC engine has increased power over the IMO Tier II model. The engine’s new two-stage turbo charging also offers a faster response time, the company says.

GE’s L250 engines rated at less than 2,000kW will meet EPA Tier III emission levels ahead of the 2016 deadline, the company claims. Depending on duty cycle and application, the L250 engines have greater than 5% improved fuel consumption compared to Tier II standards. In addition, the 8L250 and 12/16V250 engines rated at more than 2,000kW will meet EPA standard path Tier 4i (interim) requirements in 2014.

MAN Diesel & Turbo will also be at Europort to exhibit the latest addition to its four stroke range, L35/44DF, which is available in both dual fuel and gas only versions. The DF version complies with IMO Tier II emission limits in diesel mode and IMO Tier III limits in gas operation. In line with coming choices facing shipowners on fuel use, MAN Diesel & Turbo made a high degree of fuel flexibility – HFO, MDO, MGO and natural gas- a primary objective in developing the engine.

MAN Diesel & Turbo says that L35/44DF engine is a significant step in marine engine technology, not least because its attributes can be retrofitted to engines already in service – and specifically to the popular 32/44CR series Tier II-compliant engines.

Ballast water

Another issue on the MEPC agenda this year was ballast water management. MEPC65 approved a draft IMO Assembly resolution which recommends that ships not be required to install a ballast water management system until its first renewal survey after entry into force of the BWM



David Tongue, International Chamber of Shipping highlights concerns over NOx Tier III proposals

Convention, the resolution is expected to be adopted by the Assembly in November.

MEPC 65 also adopted a circular to initiate a trial period for the sampling and testing of ballast water by port state control, during which port state control will refrain from detaining a ship or taking criminal sanctions in the event that a BWMS does not meet the discharge.

MEPC has agreed there should be a five year phase in period to fit treatment systems to the existing fleet following entry into force of the ballast water convention, pegged to the ship’s renewal survey date. All ships built before the entry into force of the convention are deemed to be existing ships. It was also agreed that the renewal survey to be used to determine a ship’s regulation D-2 compliance date was that which was applicable to the IOPP certificate under MARPOL Annex I and not the International Ballast Water Convention certification, which means that 20% of the world fleet will be fitted per year over the five year survey cycle.

Tim Wilkins, senior manager for environment at independent tanker owners association, INTERTANKO comments: It’s good to see a pick-up in pace on the work

relating to the practical and operational questions surrounding this issue. With the regulatory aspects associated with the Convention entry into force heading down a more practical path at the IMO and hopefully approved at the November Assembly meeting, what we really need now is to get more confidence into the industry about the ballast treatment systems and the port state control approach. Industry confidence must now come from a more pragmatic approach by port state authorities.

“There needs to be greater recognition by port state authorities that owners who’ve installed systems need to be given the opportunity to test these systems alongside and in conjunction with the sampling research being undertaken. With a broad understanding of the problems now out in public, including port state control sampling problems, type approval and treatment system effectiveness issues, then there should be a concerted effort by all involved to work together for once and not in isolation.

“There are a few initiatives that have stemmed from the recent IMO agreements, which should facilitate this effort and that’s where I think we, as the industry, will be able to gain the confidence to be able to meet the requirements once the Convention enters into force.”

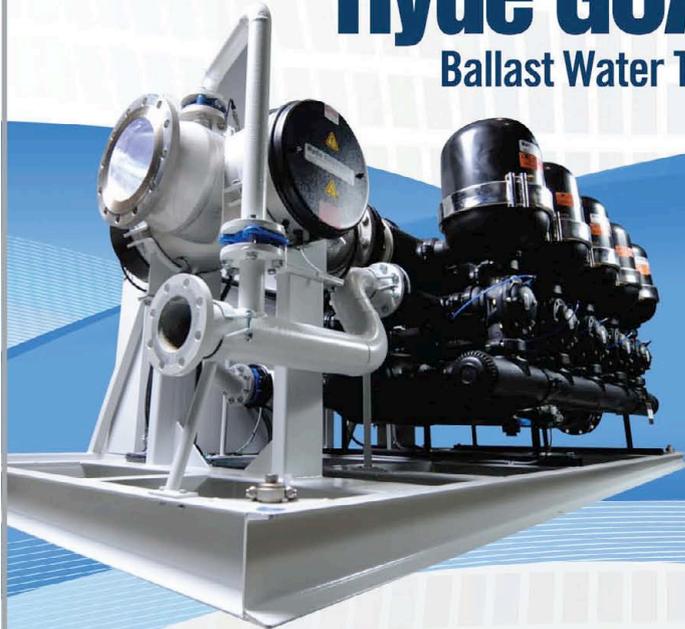
The convention will require owners to understand compliance standards, develop a ballast water management plan, select and install a treatment system and train personnel to operate the system. Their ships will be subject to surveys and inspection to maintain certification.

Ratification by 30 states is necessary, accounting for 35% of world tonnage. While the convention is expected to reach the necessary ratification level soon, there have been suggestions that the pace of ratification has slowed in the last year and large registries like Panama and Greece have yet to do so.

According to the UK P&I Club, “There is strong support for the Ballast Water Management Convention, given the damage caused to the environment by invasive alien species, depletion of fish stocks and the high cost of controlling these effects. However, ballast water management systems must avoid harming

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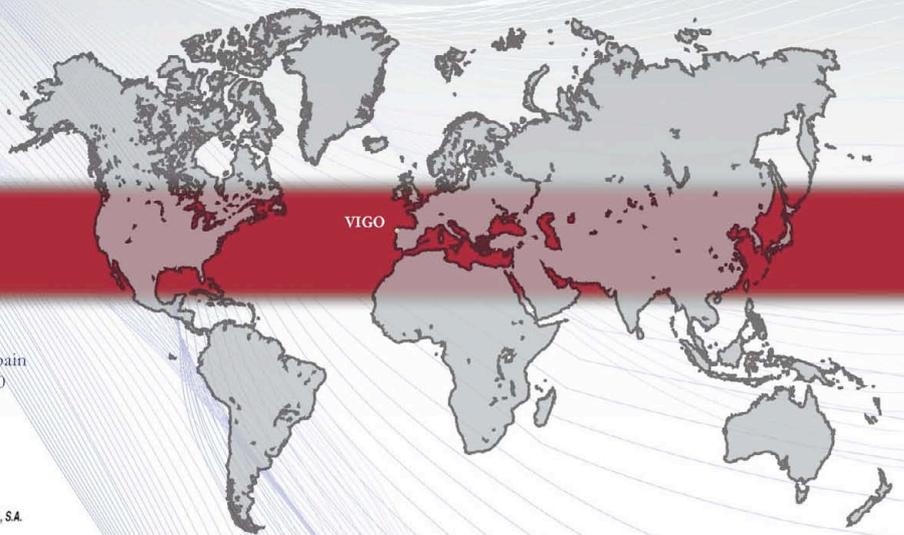
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ship, crew, environment and public health – and gain formal approval, in the UK from classification societies.”

The club estimates that a ballast water treatment system can cost from half a million to US\$4 million. There will be ancillary costs, including developing a ballast water management plan, dry docking and installation.

There are two standards of compliance. The ballast water exchange standard (BWE) does not require the ship to install a treatment system, but will be phased out by 2019. The ballast water performance standard (BWP) does require such a system.

Alternatives to the BWE and BWP methods must ensure at least the same level of protection to the environment, human health, property and resources, the club explains.

Parties to the Convention can impose additional measures on ships to prevent, reduce or eliminate the transfer of harmful aquatic organisms and pathogens through ships’ ballast water and sediments. Ballast water management systems complying with the Convention standards may still fall foul of more stringent standards set in the US and other countries. Shipowners, who trade to those jurisdictions must, therefore, install systems that meet the more stringent standards.

Ballast water management plans must be tailored to each ship and the working language of the crew. They should include a description of the system, how it is operated, safety procedures for ship and crew, managing ballast and sediment onboard and procedures for disposing of sediment. The designated Ballast Water Management Officer has to ensure all ballast water operations are recorded in a Ballast Water Record Book – which must be available on board for inspection by authorised officers, the club explains.

Factors affecting system choice include space onboard, enough energy to operate the system, compatibility with existing systems on board, crew safety, operating time, and cost. Staff training will play a key part in each plan.

The flag state will require surveys of the ship’s construction, equipment and management system to ensure compliance with the Convention’s requirements. An

initial survey concentrates on technical installation and equipment specifications in pursuit of an International Ballast Water Management Certificate or Certificate of Compliance, with addition surveys carried out periodically to check the plan is being carried out.

“There needs to be greater recognition by port state authorities that owners who’ve installed systems need to be given the opportunity to test these systems alongside and in conjunction with the sampling research being undertaken”

Jacqueline Tan, senior claims executive at the UK P&I club’s manager Thomas Miller, appreciates owners’ concerns about the convention. “The high economic costs to ship owners, introduced by the Convention, coupled with a lack of confidence that the proposed equipment and procedures can effectively tackle the adverse effects, probably explains why the rush to ratify the Convention has slowed down.

“While MEPC65 and the revised implementation schedule have given owners breathing space, it would still be prudent for them to get to grips with the Convention’s requirements.”

Emissions

In common with the rest of North America, Canada announced recently that it was putting in place an Emission Control Area (ECA) round its coastline, with a view to

aligning Canadian air emission standards with those of the US.

According to Minister for Transport, Infrastructure and Community Denis Lebel, the aim is to reduce Canadian greenhouse gas emissions by 17% by 2020. New requirements have been introduced to ensure international vessels operating in Canadian waters more energy efficient, while new conditions have been introduced with regard to grey water, which has to be handled to the same standard as sewage for ships carrying more than 500 passengers.

Shipowners also need to address tightening sulphur dioxide emissions restrictions from 2015, particularly in ECAs. Under the currently agreed schedule, the amount of sulphur permitted in marine fuels will fall in ECAs from a current 1% to 0.1% in 2015, and globally in 2020 from 3.5% to 0.5%.

Many industry observers believe that the 2020 global cap of 0.5% will be deferred to 2025. At a conference organised by bunker suppliers Bunkernet in Limassol in April, Robin Meech of Robin Meech Marine and Energy Consulting said he believed there would be enough diesel to meet the 2015 deadline but the transition might be “lumpy”. He warned bunker buyers to ensure they had secured supplies ahead of time. If the global cap comes in 2020, the need for diesel will increase dramatically, and he did not believe refineries could handle it.

He told the seminar there was also a lack of incentive on the part of refineries to invest in diesel for the marine market. If the global cap comes in 2020 there would be a deficit of gasoil, but demand could be met if the cap was delayed by five years, he believed.

Other recent moves on the regulatory agenda include the publication of a proposal by the European Commission for a Regulation on the monitoring, reporting and verification of CO₂ emissions for maritime transport (MRV) and describing the regulatory framework for a mandatory CO₂ MRV, including detailed practicalities for implementing the regulation.

Commenting on the new proposal, Alfons Guinier, secretary general, European Community Shipowners Association, said: “ECSA can see value in the EU initiative for an MRV of CO₂ emissions,



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as a contribution towards finding the most appropriate global solution for CO₂ monitoring from international shipping. It then follows that any mandatory requirements on MRV for the international shipping sector must be agreed upon at IMO level, as this is the only way of securing a globally harmonised system. ECSA appreciates that the Commission is following this line of thinking.

“Any MRV system must be accurate, simple, cost-effective and exclusively based on the vessels fuel consumption. Though the proposed Regulation is supposed to be of generic nature, some details have been included which proved to be sensitive in the discussions with industry and do consequently need further consideration,” Guinier added.

ECSA is prepared to play a constructive role in the up-coming discussions on the specifics of a MRV system for international shipping. However, once the purpose for and the methodology of collecting data have been clarified, it must be ensured that the realities and practicalities of the shipping industry are taken into account and that the system is workable both for the industry and for the authorities.

Ship recycling

MEPC 65 also saw the establishment of a working group under the chairmanship of Kristine Gilson of the United States which is tasked to consider issues relating to threshold values and exemptions under the Hong Kong Convention 2009 on ship recycling, and, the issue of port state control inspections relevant to the Inventory of Hazardous Materials.

According to David Tongue, the Committee did not agree to amend the 2012 Guidelines for the Inspection of Ships under the Hong Kong Convention, as the issues raised in the document had been extensively discussed during MEPC 64.

However, there were concerns by some member states that a failure to update part 1 of the Inventory could lead to errors in the Ship Recycling Plan, despite ICS observing that the survey and certification system under the Convention would pick up any such deficiencies. “ICS will continue to monitor this issue to ensure that future decisions do not result in an unnecessary and burdensome increase of the additional survey provisions of the Convention on its entry into force,” he said.

Proposals to develop separate lists of threshold values for existing ships and for newbuilds on the grounds that certain of the values would not be appropriate for new equipment and could, therefore, be confusing for equipment suppliers were not supported for a number of reasons, he said.

Not least of these was the argument from ICS and other industry partners that two separate lists would create significant confusion for ships and recyclers attempting to comply with the Convention, recognising that the focus of the inventory of hazardous materials was to safeguard the health of workers and the protection of the environment in ship recycling facilities.

Meanwhile, April saw European Parliament reject the suggestion to introduce a levy on all ships calling at EU ports that would finance a fund to support safe recycling of ships. Instead, the

Parliament adopted an amendment inviting the Commission to come back by the end of 2015 with a new legislative proposal for an incentive-based system that would facilitate safe and sound ship recycling.

“We are pleased to note that the European Parliament has rejected in plenary the suggestions on the recycling fund”, commented Alfons Guinier.

“Imposing a regional measure with the proposed levy would have resulted in non-ratification of the Hong Kong Convention by the key recycling states, China, India, Bangladesh, and Pakistan. Indeed, if such a proposal would have been agreed, it would have delayed the intentions to improve recycling conditions globally, which ECSA is asking for on the basis of the Hong Kong Convention.” He urged member states to move ratify it as soon as possible.

According to Tim Wilkins there has been “a lot of noise” on the ship recycling issue in Europe over the last six months and it seems that the more logical path has been chosen, albeit with the odd exception, in terms of a EU based regulation on ship recycling.

“Using the Hong Kong Convention as a foundation must surely be the best for all concerned, giving any regional approach by Europe an impact globally. IMO is still working hard to ensure a strong set of guidelines for the Hong Kong Convention, which are now almost complete. We would hope that with Norway now the first state to ratify the HK Convention we will see one of the major recycling states also step up and be among the first to it”. **NA**

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Second Announcement

Continuing growth in passenger numbers mean that vessels are now operating in locations that are more environmentally sensitive and even more remote. This places new challenges not only on the design requirements of new and existing vessels, but also the operational capability and safety procedures. Recent events - such as the loss of the *Costa Concordia* and a number of machine space fires that have left vessels stranded - highlight the need to review and understand the impact of proposed legislation and the importance of continual regulatory development.

The need to balance economic and environmental efficiency with increased passengers expectations of comfort and onboard amenities, along with improved passenger and crew safety, brings new challenges for those involved in the design, construction and operation of today's passenger vessel. To further investigate this aspect of the industry, RINA invites papers from naval architects, class societies, operators, researchers, and builders on all related topics, including:

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Knowledge is power

Measuring and monitoring efficiency for the global fleet must come from an independent source explains John Willsher, market manager, International Paint

There is no doubt that shipping is becoming increasingly proactive towards emissions reduction. The truth is that the industry now has little choice.

Fuelled by sustained high bunker costs and the need to generate efficiencies wherever possible whilst complying with growing emissions regulations, shipowners and operators are investing in operational and technical measures to safeguard the future of their fleet.

Whilst the choice of viable technologies continues to grow, this is only one half of the emissions reduction equation. The missing piece is a credible, universally agreed and independent methodology for measuring and verifying emissions reduction.

For the market to fully realise the fuel and emissions reductions benefits of new and emerging technologies, it will need to fully trust the fundamental data and analysis behind performance and efficiency claims.

The lack of an independent standard and verification is a claim that has been pursued against the clean technology sector for some time. The conventional wisdom would certainly suggest that the take up of clean technologies would be boosted even further with one.

For owners and operators, such a methodology would provide a significant commercial advantage as they seek to increase and prove their fleets' efficiency. An agreed standard would also demystify current fuel savings claims and provide technology providers with a 'level playing field' from which to measure their products. However, in order to substantiate these assumptions, an objective and independent consortia are required to undertake an independent study to corroborate these assumptions.

Once gathered, this data can be used to reflect the industry's sentiment for a unilateral and independent methodology standard for measuring emissions reduction; importantly it is the sentiment of multiple industry stakeholders, particularly owners and operators, and not just technology companies that inevitably have a vested interest.

To measure is to know, and real-time, automated performance monitoring has the



John Willsher says the maritime industry must have independent verification of efficiency monitoring

potential to enable the crew onboard a vessel to take necessary actions early in response to changing conditions that can adversely affect fuel consumption. From an onshore management perspective, real-time, onboard performance monitoring enables long-term trends to be measured and analysed to enable faster and more precise decision making within the long-term goal of developing more efficient fleet operations.

Currently, most shipowners and operators have limited information about the fuel consumption and the energy efficiency of their fleet. For most, performance analysis is carried out manually with operators comparing energy performance reports and audits in isolation against budget estimates.

Many shipowners and operators today have to rely on inadequate information and data to justify investments. If they don't have confidence in the fuel and emissions reduction figures that are claimed, the take up of these technologies and further innovation will be stifled and customers will spend more on fuel than they need to at a time when budgets are being significantly stretched and charterers are increasingly scrutinising their fuel spend. With current technology and innovation there is the scope for a meaningful framework and roadmap for calculating fuel consumption and a level playing field provided for all.

With hull coatings being the most widely used eco-efficient technology on the market, and as a leading global marine coatings supplier, International Paint has the opportunity, and responsibility to lead the way. However, it should not, and cannot be up to hull coatings companies to set the parameters and methodologies by which their products are measured; a principle that is relevant to all clean technologies and their manufacturers.

The best and most appropriate thing we can do is to let independent, third party expert fuel and emissions monitoring organisations, in consultation with a cross-section of industry stakeholders develop a standard model that can be applied to measure fuel consumption and the savings that can be generated through technology.

Tapping into accurate, high-quality and high-frequency fuel consumption and vessel performance data, collected from ships' sensors monitoring engine torque, navigational systems and the speed log, throughout the service life of a vessel could become a fundamental way of improving the operational efficiency of the global shipping fleet.

Ensuring independence is critical and the most responsible and effective way to generate credibility and accurate eco-efficiency benefits for clean technology manufacturers, which will serve to build trust with shipowners and operators and the wider shipping industry.

Accurate measurement can only serve to challenge coatings manufacturers to continue to develop technology to better serve future demands for greater efficiency within the industry. Technology providers for their part must seek to understand customers' needs and calibrate investment in research and development to stay ahead of the challenges that emerge.

The current economic challenges and the realisation of multi-faceted regulation facing the industry are not the first time in shipping's long history that it has been faced with making hugely impactful decisions. As in the past, challenges should inspire innovation to create long-term sustainability. Investing in innovation now is most certainly the way ahead. **NA**

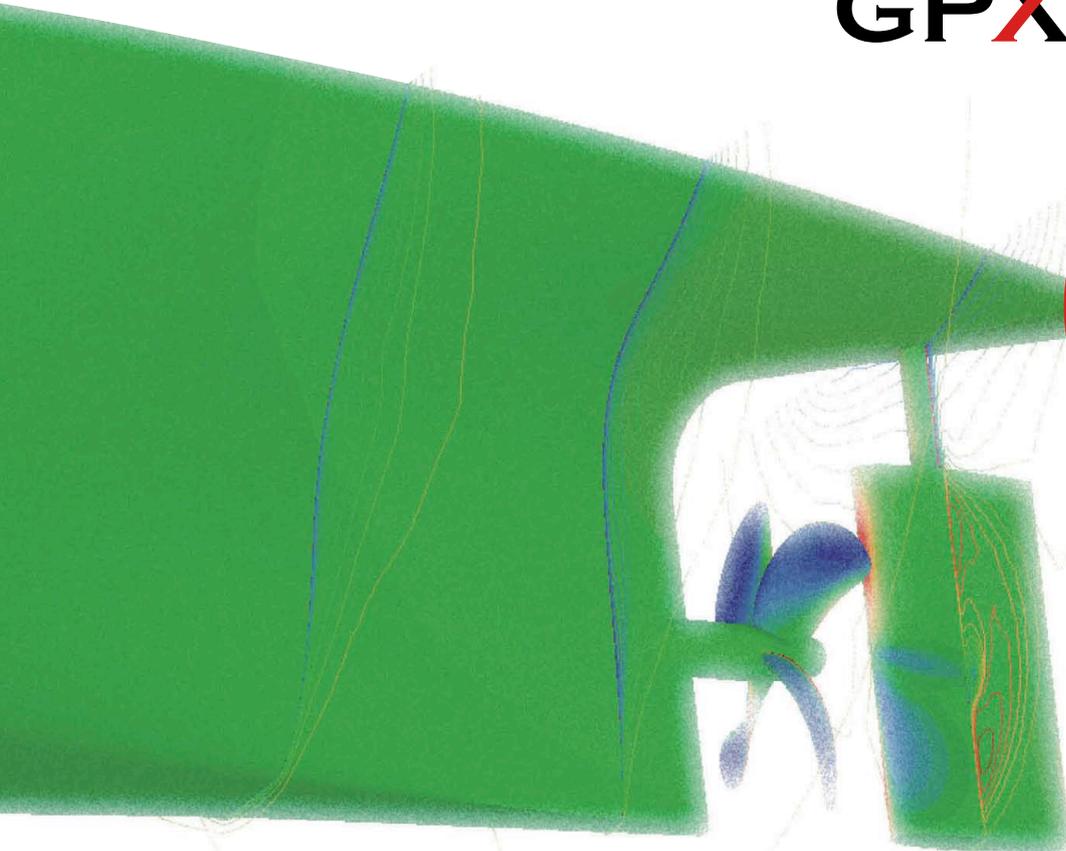
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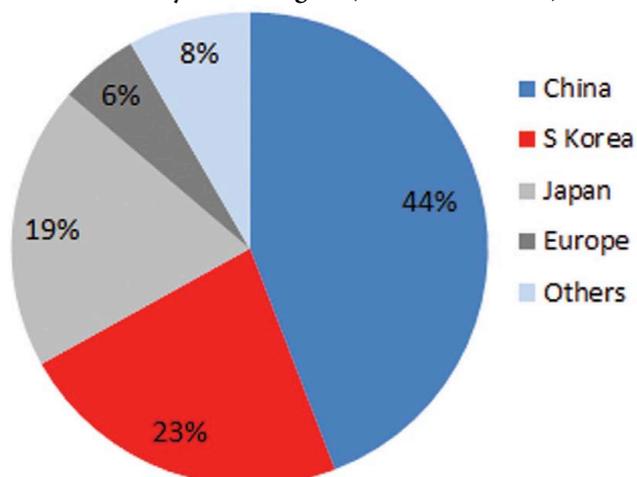


Clarkson Research Services: Historic and Scheduled Delivery

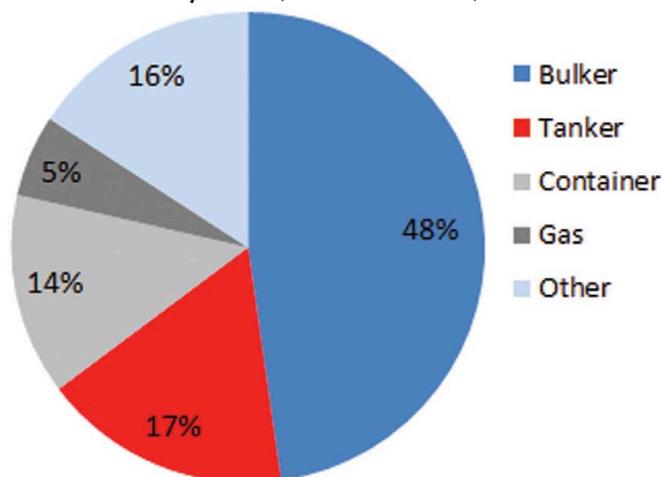
Data extract from

Vessel Type	2004		2005		2006		2007		2008		2009		2010	
	1st Half	2nd Half												
VLCC >= 200,000	15	14	15	16	5	13	15	14	18	23	32	21	30	24
Suezmax 120-200,000	17	10	16	9	14	12	15	11	9	5	22	23	28	13
Aframax 80-120,000	31	21	35	30	29	21	28	28	24	44	62	34	37	31
Panamax Tankers 60-80,000	26	11	24	21	25	20	26	16	16	26	25	13	15	16
Products 30-60,000	58	60	51	48	59	56	68	65	74	92	91	67	63	43
Products 10-30,000	3	4	3	5	2	9	8	10	7	6	5	5	6	7
Chem & Spec. 10-60,000	27	34	35	41	56	45	62	62	81	104	107	71	79	63
Tankers < 10,000	26	16	27	27	20	26	31	43	59	88	68	68	60	43
Capesize > 100,000	21	20	22	25	32	28	29	27	20	24	34	77	101	112
Panamax 80-100,000	3	3	6	11	22	23	22	16	15	17	27	21	60	60
Panamax 60-80,000	35	39	41	35	36	26	22	22	23	20	18	15	18	33
Handymax 40-60,000	37	43	52	48	53	40	50	50	66	59	86	100	166	167
Handysize 10-40,000	30	35	32	36	29	29	38	53	58	58	84	106	132	145
Combos > 10,000	0	0	0	0	0	0	0	0	0	0	0	0	3	2
LNG Carriers	11	9	6	12	12	16	15	17	24	27	22	17	15	12
LPG Carriers	6	5	4	3	9	15	15	20	27	33	25	18	18	19
Containers > 8,000 teu	5	10	14	18	34	28	20	17	25	25	22	13	30	33
Containers 3-8,000 teu	39	35	38	54	45	56	60	70	72	61	62	57	79	41
Containers < 3,000 teu	40	50	63	79	87	115	105	121	140	108	70	51	56	26
Offshore	7	4	5	6	4	5	2	18	13	14	14	14	24	24
Cruise Vessels	7	3	2	2	5	1	7	3	6	3	3	6	9	4
Ro-Ro Ferries	9	6	13	6	8	7	4	7	16	5	9	7	10	8
Other	64	61	73	74	99	120	143	133	151	147	137	150	160	174
TOTAL	517	493	577	606	685	711	785	823	944	989	1,025	954	1,199	1,100

Orderbook by builder region (number of vessels)



Orderbook by sector (number of vessels)



World Fleet Register available at www.clarksons.net/wfr



2011		2012		2013	Scheduled Orderbook			
1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half 2013	2014	2015	2016
35	27	27	22	21	19	32	7	0
23	19	31	16	25	16	25	10	5
27	32	29	14	13	12	37	32	3
19	7	8	6	6	9	15	0	4
46	22	24	29	48	39	137	46	2
2	7	7	0	1	6	3	0	0
53	46	40	13	11	33	17	5	4
45	40	57	23	20	41	20	2	0
128	123	149	64	63	66	106	65	22
83	97	140	94	100	85	163	37	7
38	47	53	39	35	70	103	6	1
192	189	223	133	137	168	244	102	15
143	152	202	102	106	117	176	75	8
3	0	0	0	0	0	0	0	0
5	10	1	2	4	16	32	36	17
15	14	13	7	23	19	38	25	2
46	25	50	28	51	31	108	79	17
33	26	40	19	45	43	62	18	6
32	29	33	33	29	34	48	22	3
28	24	33	15	16	22	92	40	26
4	2	6	1	5	0	8	8	7
10	5	6	4	4	7	12	3	0
175	167	190	89	86	112	126	56	4
1,185	1,110	1,362	753	849	965	1,604	674	153

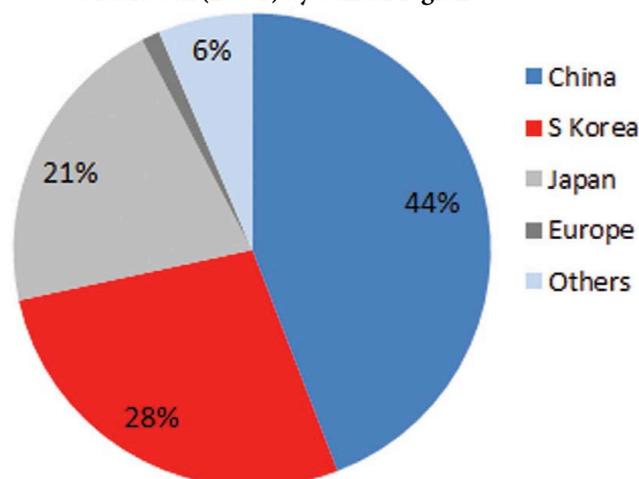
Data includes all vessels with LOA estimated at >100m

Where scheduled month of delivery is unknown an arbitrary month of build has been applied for order-book data

The orderbook by year of delivery on this page is based on reported orders and scheduled delivery dates and do not necessarily represent the expected pattern of future deliveries

All data taken as of 1st August 2013

Orderbook (DWT) by builder region



Source: **Clarkson Research Services**

Danish operator commits to high speed mode

As a North European endorsement of the high-speed mode at a time of general fleet investment wariness, intense cost, regulatory pressures and challenging economic conditions, Mols-Linien's commitment to a second Incat 112m wavepiercing catamaran has particular significance, writes David Tinsley

Contracts for high-speed passenger/vehicle ferries have been at a low ebb since the global financial crisis in 2008. However, following its delivery voyage from Tasmania via the Panamanian isthmus to western Denmark, *KatExpress2* entered service in early May on the 39nm domestic route, between Aarhus and Odden, connecting Jylland (Jutland) with Sjaelland (Zealand).

The vessel has increased Mols-Linien's capacity by 65%, such that it now offers up to 24 daily departures between Jylland and Sjaelland, achieving a significant increase in car and passenger volumes.

The Danish operator has taken a 10-year lease on the vessel, with an option to purchase, as was the case in 2012 with its running mate *KatExpress1*, and the company is unequivocal in its belief in the long-term future for the concept encapsulated by the ships. Positive results achieved by *KatExpress1* in its first year on the Kattegat coloured the latest



Bridge onboard *KatExpress2*

fleet development decision, which was underpinned by a strategy delineated in 2011 to focus entirely on operating high-speed passenger/car ferry services.

Mols-Linien is well experienced in high-speed ferry operations, the initial and ongoing powerful motivation for the company's dedication to this field being the Great Belt Fixed Link. Opened to rail transport in 1997 and to road traffic in 1998, the fixed link had an immediate and significant impact on the Kattegat ferry business. Mols-Linien's preparation for the permanent change in the competitive scenario, and the start point for investment in high-speed vessels, had been to complement its ro-pax operations by introducing two 43knot Danyard Seajet passenger/vehicle semi-SWATH (small waterplane area, twin-hull) ferries on to its Ebeltoft/Odden route in 1996.

Today, with the gas turbine-powered Seajets laid up and awaiting sale, and the last conventional ferries withdrawn, the Mols-Linien network is sustained by three all-diesel wavepiercers, comprising one of the 91m type plus the two 112m vessels, which have conferred greater scale economies and improved operating efficiency. The 91m cat is used on both the Ebeltoft/Odden and Aarhus/Oden services, while the new sisters are deployed exclusively on the Aarhus run.

Fast crossing times and frequent sailings are pivotal to the Mols-Linien offering in the face of the fixed link competition to the south, but the company's philosophy is one wherein speed is complemented by a focus on service quality and passenger comfort, and by the application of 'best practice' in every aspect of operations both onboard and ashore. Since the decision two years ago to expand fast ferry

TECHNICAL PARTICULARS

KatExpress2

Length, overall	112.60m
Length, waterline.....	105.60m
Length, b.p.	95.80m
Breadth, extreme	30.50m
Breadth of hulls.....	5.80m
Draught	3.94m
Passenger capacity	c. 1,000
Ro-ro capacity	415 cars (or 210 cars + 567 truck lane-metres)
Gross tonnage	10,500gt
Main engines.....	4 x 9,000kW
Service speed	36-38knots
Trials speed, @672dwt.....	42.1knots
Class	DNV +1A1, HSLC, R1, Car Ferry "B", E0
Flag.....	Denmark

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The 112m *KatExpress2* has given new momentum to Mols-linien's business development based on high-speed

capacity and bow out of conventional ro-pax operations, restructure has entailed workforce reductions and scrutiny of every aspect of cost, and substantial improvements have been achieved with the introduction of the 112m catamarans.

KatExpress2 provides seating for 1,000 passengers and can load 415 cars, or 210 cars plus 567 truck lane metres. Headroom on the main deck allows for a number of coaches to be carried as well as goods vehicles. While the service speed is in the order of 36-38knots, it achieved 42.1knots at approximately 672dwt during sea trials off Tasmania.

Four resiliently-mounted MAN engines of the 28/33D type, derived from the Ruston RK280 design, each produce 9,000kW at maximum continuous output, making for a power concentration of 36,000kW. Drive is through ZF6000 reduction gearboxes to four Wärtsilä LJX 1500SR waterjets configured for steering and reverse.

For *KatExpress2*, Mols-Linien specified a contemporary, high quality yet functional dual-class interior designed to maximise comfort and onboard revenue. Notable features include a business class with luxury leather seating and panoramic views, a bistro restaurant, a large café bar, two cinemas, a children's play area, a protected promenade deck, and an outdoor area aft.

Access to the passenger lounges is by way of a passenger lift, ramps or stairwells, all designed to minimise embarkation and disembarkation times. The main vehicle deck has hydraulically operated stern gates. The upper car deck can be reached by either a two-lane ramp from the main deck or directly from an innovative, two-tier linkspan installed by Mols-Linien at Odden, at the eastern end of the service on Sjælland.

By taking the initiative to design and provide the new linkspan, the operator has ensured that full-load turn-arounds can be achieved in only 28 minutes, fully exploiting the capabilities of the 112m wavepiercer. In practice, the schedule accommodates slightly

longer minimum turnaround times. Simultaneous loading or unloading of both vehicle decks is currently not available at the western end of the run, in Aalborg, although it is understood that plans are in hand for terminal relocation and provision of dual-tier working at the port.

A technologically advanced structural fire protection system known as Rapid Access Composite (RAC), and claimed to be up to 70% lighter than conventional metal clad solutions, has been fitted throughout *KatExpress2*. Developed by the Tasmanian company CBG Systems (originally Colbeck & Gunton), the panelised configuration of the RAC passive fire protection system offers efficiencies to the shipbuilder by allowing rapid customisation of the vessel according to owners' specific requirements. The arrangements also deliver efficiencies to the operator through the weight saving, estimated in the case of the *KatExpress2* to be of the order of 45tonnes.

KatExpress2 is the fourth of Incat's 112m design. The first pair, *Natchan Rera* and *Natchan World*, were delivered in 2007-2008 to Tsugaru Kaikyo Ferry and initially traded on the Aomori/Hakodate route. The two vessels have now been assigned to Taiwan services following the creation of a partnership between the Japanese operator and the Taipei-based Wagon Group. The third 112m wavepiercer had started service life on the English Channel in 2009 as *Norman Arrow* before being secured by Mols-Linien in 2012 under 10-year charter as *KatExpress1*. [NA](#)

KatExpress2 joins *KatExpress1*



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Innovation showcase for River Plate

Provoking the interest of ferry operators worldwide, Austal presents the world's first high-speed, dual-fuel, gas turbine ferry designed for operation on LNG bunkers is set to enter service on the River Plate, writes David Tinsley

A longstanding investor in speed and advanced propulsion solutions, Buquebus is about to ring the changes in the traffic between Argentina and Uruguay through the introduction of the 99m wave piercing catamaran *Francisco*.

Having attained over 58knots on sea trials, the latest delivery from Incat pushes back the bounds in speed as well as being the first vessel built under the HSC (high-speed craft) Code to be powered by gas turbines using LNG as the primary fuel. Since the ferry is capable of making 47knots-plus with a full payload of 1,000 passengers, plus about 150 cars, the Buquebus service between Buenos Aires and Montevideo has been put on a stronger footing to compete with airline operators.

Due to the high service speed requirement, the owner had discounted the use of reciprocating engines in favour of a gas turbine propulsion plant. The lightweight, small footprint and very high power density attributes of gas turbines are well suited to criteria for the fastest, light



The LNG loading operation onboard *Francisco* can be completed in under one hour

displacement vessels and Buquebus opted for two GE Energy LM2500 gas turbines rated at 22MW apiece. Each prime mover and ancillary equipment is housed within a steel enclosure in each hull, and a 7:1 ratio ZF reduction gearbox is interposed on each driveline to the Wärtsilä LJX 1720SR waterjet, configured for steering and reverse.

While aero-derivative gas turbine machinery is an established propulsion mode in the lightweight ferry sector, the adoption of gas turbine plant using LNG bunkers breaks new ground for the industry. It could prove seminal, given the prospect of tightening environmental controls in areas and regions where ferries are elemental to the transport infrastructure.

GE's experience of dual-fuel operations with land-based applications of the model chosen laid the ground for the adoption of machinery capable of running on either marine distillate or gas. For Buquebus, LNG offers important economic as well as prospective environmental advantages compared with distillate.

LNG will be the ferry's primary fuel, whereby a secondary heat exchanger system

will utilise waste heat energy from the turbine exhaust to vaporise LNG from the storage tanks, changing its state to gas for ingestion in the main machinery. The power plant will use marine distillate for start-up and during the ensuing minutes until the heat exchangers have produced enough gas from the LNG to allow changeover to LNG fuel. On arrival in port, the gas turbines revert to distillate for the vessel manoeuvring phase. The distillate will also serve as standby fuel.

Two 200kW Caterpillar C9 gensets provide electrical power for gas turbine services, including starting, while four Cat C18-based aggregates of 340kW apiece cover the domestic load.

The contract for the design, manufacture and supply of the LNG fuelling system, including the storage tank, piping, controls and bunkering arrangements, was awarded to Chart Ferox, located in the Czech Republic at Decin. A wholly-owned subsidiary of Chart Industries of the USA, the company is a pioneer in the development of LNG fuel delivery systems used within the transportation sector at large.

TECHNICAL PARTICULARS

Francisco

Length overall	99.00m
Length, waterline.....	90.54m
Beam.....	26.94m
Draught	3.00m
Deadweight	450t
Gross tonnage	c.7,000gt
Passenger capacity.....	c.1,000
Cars.....	c.150
Propulsion machinery	2 x LM2500 gas turbines
Propulsion power.....	2 x 22MW
Speed, 100% output @450dwt.....	47kts
Lightship speed.....	53kts
Class	DNV +1A1, HSLC, R4, Car Ferry B, Gas Fuelled, EO
Flag.....	Uruguay

The Chart Ferox 'package' for *Francisco* included two 43m³ capacity LNG storage tanks and cold boxes with vaporisers, pumps, valves, bunker stations, control systems, safety detectors, a glycol circuit and a heat management system for the turbine exhaust gases.

Positioned amidships in a compartment immediately above the double-bottom marine distillate bunker tanks, the LNG tanks are of double-walled, stainless steel construction. They embody proprietary, multilayer composite vacuum insulation to maximise fuel capacity and maintain the LNG in its liquid state at a temperature of minus 163°C.

Onboard tank volume is sufficient to enable the complete, 250nm round-trip on the Plate to be accomplished on LNG with bunkering at just one port, Buenos Aires. The bunkering system has been designed so that the complete LNG

loading operation can be accomplished in less than one hour. Changeovers between LNG and distillate will be automatically controlled and will be performed as a 'seamless' operation.

Buquebus has also put down a new marker for the industry by investing in shoreside plant that will make the company self-sufficient in producing the LNG fuel that will be bunkered by its new vessel. Developed and manufactured by the Argentinean company Galileo, the cluster of seven Cryobox LNG 'nano' stations has a combined, maximum capacity of 84tonnes or 49,000 gallons per day. The plant employs a high-pressure thermodynamic cycle that converts natural gas into liquid by cooling to minus 163°C.

The entire plant 'package' has been designed for transportation on a trailer. The trailer will be hauled from Greater Buenos Aires to the Buquebus

ferry terminal, to undertake dockside refuelling of *Francisco*. The integrated Cryobox solution thereby offers users, and especially smaller or privately-owned organisations, a high degree of delivery flexibility and obviates the costs and issues associated with establishing a permanent bunkering or refuelling point.

Incat has a long track record as an innovator. The new Buquebus ferry and her complex engineering system encapsulates the pioneering approach of the Tasmanian yard its partner company Revolution Design. The vessel represents a step forward in the marine industry as the first blending of a number of different technologies, each well proven in their own right. Substantial technical and regulatory challenges have been presented by the project. For this 'first-in-kind', the required DNV rules had to be reconsidered to ensure compliance. **NA**

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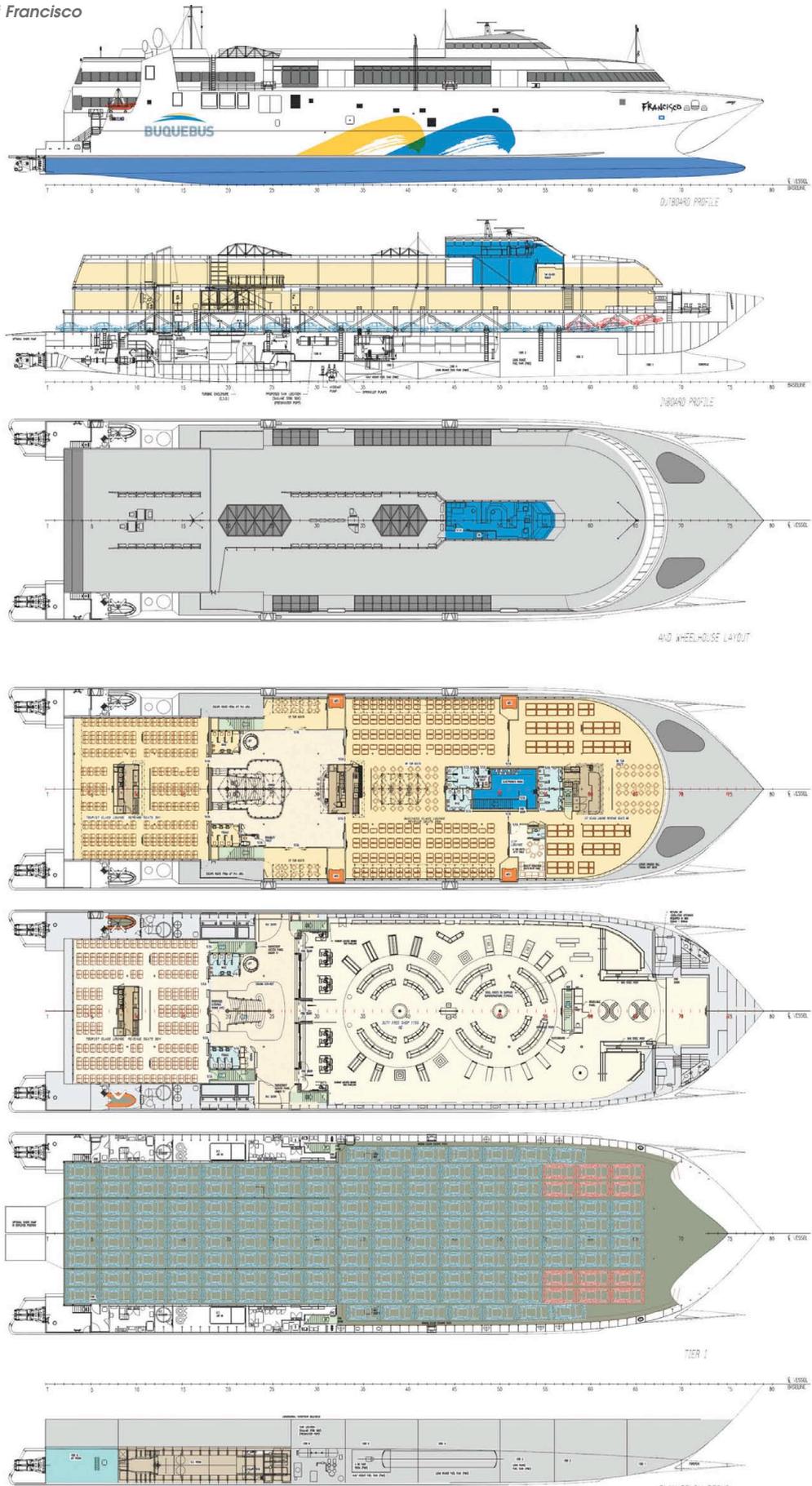


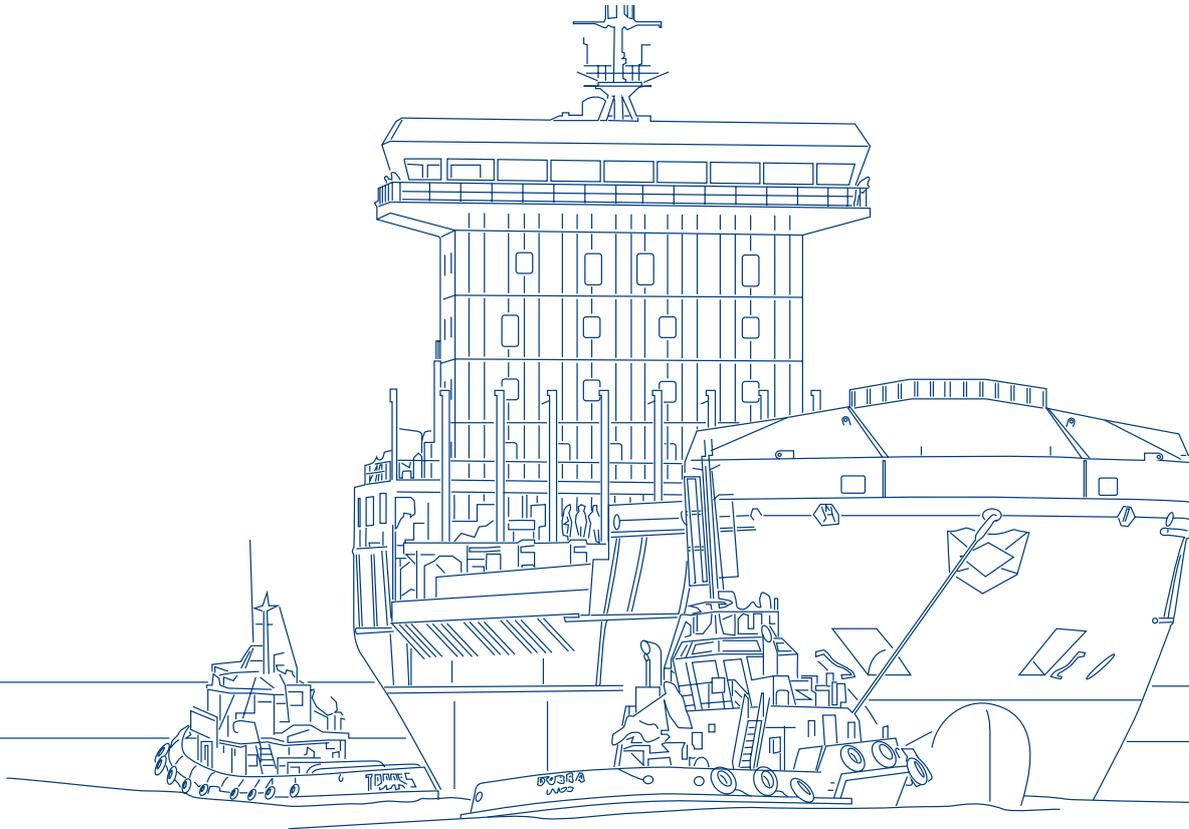
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General arrangement of *Francisco*





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Austal ferries come in all shapes and sizes

Against a backdrop of subdued demand for large, high-speed ferries, and with the strength of the Australian dollar hitting exports of capital products, Austal Ships has continued to mould its specialised know-how and capabilities to other market sectors, writes David Tinsley

The Henderson headquarters yard in Western Australia, the fountainhead of the company's fast ferry design and construction expertise, is currently heavily engaged in patrol boat production, and strategic investments in Australia and beyond are geared to developing the servicing and support infrastructure for military as well as commercial customers, existing and future.

The growth of the defence workload at Austal's cost-efficient, modern shipyard in Alabama, a pillar of group activities, is pronounced.

A common thread in the company's shipbuilding business development in both Australia and the US is Austal's application of fast ferry technology to other fields, notably defence. This is especially well expressed in the US Navy Joint High Speed Vessel (JHSV) and Littoral Combat Ship (LCS) projects, which both leverage heavily from Austal technology originally developed for commercial ferry applications.

Austal's impressive fast ferry pedigree is such that well over 60 separate designs have been built to date in monohull,

catamaran and trimaran configurations from 24m to 127m in length. Amid the distinctly more diversified group output of recent years, and notwithstanding a quieter ferry market overall, the lightweight aluminium ferry lineage continues to be extended.

Continuity of production is evident at Austal's Philippines shipyard, where an 80m vehicle/passenger catamaran is at an advanced stage of construction for a leading French Polynesian operator and is thought to be the largest ferry built in the Philippines to date.

Offering capacity for 967 passengers and 146 cars, or a mix of cars and trucks, the newbuild will be phased into Tahiti/Moorea service with Aremiti Ferry, and will be the company's fourth Austal vessel.

Adaptation to altered economic conditions is manifested in the specified, fully-laden service speed of 20knots, engendered by a four-engine MTU installation driving fixed-pitch propellers. The nomination of a 'medium' speed for the 80m vessel compares with the very high service speeds characteristic of its *Auto Express* forebears.

Under Austal ownership, dating from the November 2011 acquisition of the former FBMA Marine facility at Balamban, the Philippines yard has sharpened the company's competitiveness on the international market. Having completed a 27m trimaran for the European offshore wind farm market at the start of 2013, and with the 80m *Aremiti* catamaran due to be ready this October, the next project going through the yard entails three 27m catamaran wind farm support vessels. Austal has already spent about US\$5 million yard improvements and has undertaken some feasibility studies and planning regarding potential development to increase maximum newbuild vessel size.

The tactic of building a broader market portfolio through recourse to core know-how in the fast ferry domain yields innovative results, as demonstrated by the addition of the Austal Shadow 54 concept to the design offering. The 54m trimaran was conceived as a support vessel to carry helicopters, tenders and other equipment typically associated with luxury yachts, but constitutes a flexible platform for tailoring to other applications including offshore patrol and wind farm service duties. The hull form can also be utilised as the basis for a ferry.

Austal's proposed 102m trimaran will have a range of approximately 450nm when operating on LNG



Austal tells *The Naval Architect* that the company regards the development of its trimaran hull forms as perhaps the single greatest technological advancement in its 25-year, 250-plus vessel history. "The trimaran hull form effectively decouples vessel length from capacity and permits the marriage of a cost effective, revenue-earning platform with a longer hull form that offers superior seakeeping in a range of conditions," says Austal. The primary benefit of this in ferry service is a more comfortable ride for passengers in all circumstances.

To date, Austal has received contracts for 11 trimarans of different types. The first was the 127m *Benchijigua Express*, delivered to Canary Islands operator Fred Olsen in April 2005. The most recent completion was a 27m wind farm support vessel for Turbine Transfers of the UK.

Austal has also positioned itself so that it is ready to meet market demand for LNG-fuelled high-speed and medium-



Construction of the 102m trimaran has begun

speed ferries. An extensive offering includes a 26knot, 102m trimaran vehicle/passenger ferry based on the same hull form and length as that of Yard No.270, the 39knot 'next generation' trimaran built several years ago. The proposed LNG trimaran has capacity for 1,165 passengers, 145 cars and 190 truck lane-metres of freight, and would be powered by three dual-fuel, medium-speed engines

driving three controllable pitch propellers. The range when operating on LNG would be some 450nm.

Like many in the ferry industry, the company is of the view that the emissions-related regulatory environment, and particularly edicts applicable to Emission Control Areas (ECAs), will drive market change. *NA*

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Spotlight again on unsafe carriage of cargo in bulk carriers

The spate of recent bulk carrier losses due to cargo issues has highlighted once again the poor quality of safety standards and cargo loading. Bentley Strafford-Stephenson, product marketing executive, Martek Marine Ltd explains ongoing issues of bulk cargoes

The sinking of *Harita Bauxite*, *Vinatines Queen*, *Jian Fu Star*, *Nasco Diamond* and *Hong Wei* since 2010 resulting in 80 lives lost should alarm policy makers, shippers and vessel masters.

The commonality between all of these vessels was that they were all loaded with nickel ore. Due to excessive moisture within the cargo, liquefaction occurred, causing cargo shift and loss of stability. This problem isn't isolated to nickel ore, it also affects other mineral concentrates and other types of cargo including fluorspar, certain grades of coal, pyrites, millscale and sinter/pellet feed.

Bulk cargoes each come with their own properties, characteristics and transportation issues. The International Maritime Solid Bulk Cargoes Code (IMSBC) dictates the requirement of the shipper to declare to the master of the vessel in writing any information of the particular properties of the cargo to be loaded, a certificate of moisture content and a certificate of Transportable Moisture Limit (TML).

Cargo should only be accepted by the master that has actual moisture content less than the TML and not simply rely on the physical appearance of the cargo which may look dry as during transit cargoes could transform from a solid state to a viscous fluid as a result of agitation from engine vibrations, vessel motion and wave impact which compact the cargo. In respect to these latest casualties it has been reported that the accuracy of the shippers' declarations and certificates is questionable.

A Water Ingress Detection System (WIDS) is mandatory on all bulk carriers since 1 July 2004 to monitor water ingress in cargo holds, ballast tanks and dry spaces as per the SOLAS XII Regulation



Bentley Strafford-Stephenson, product marketing executive, Martek Marine Ltd highlights the need for water ingress detection system for bulk cargoes

12, IACS UR S24, IMO performance standard and IACS UI SC180 yet a high number of casualties still occur each year.

There are a number of technologies on the market for detecting water ingress including: conductive/capacitive sensors with electrodes; hydrostatic level switches; pressure sensors; and microwave radar sensors. In this safety critical application performance is critical and since WIDS became mandatory in 2004 experience has shown that the differing sensors have varying performance characteristics and longevity.

Major problems that operators have observed include early failure of sensors constructed from metal and lower grades of stainless steel due to corrosion from acid cargo residues found e.g. in coal and regular false alarms from electrode based sensors due to a trickle of condensation on their surface from cargo "sweating".

Martek Marine developed their Bulksafe WIDS using intrinsically safe MMS900 float level switches made of Delrin to guarantee the elimination of false alarms and the risk of corrosion for a longer lifetime. The system comprises of a central control and alarm panel connected to the MMS900 water level detectors that are installed totally isolated from the cargo and protected from mechanical damage during cargo operations. They can be installed without the need for any structural alterations or piping work within the cargo holds.

The latest casualties stress the importance of installing a quality WIDS and relevant authorities must uphold the SOLAS regulations to ensure that these solvable disasters are prevented. Old faulty systems need to be replaced with new working systems and it must be checked by port state control that systems have not been turned off during voyage due to false alarms.

During the creation of the legislation, Martek Marine was consulted in the drafting of the performance standards, which require WIDS testing before loading cargo to confirm correct Operation. Martek's Bulksafe allows for fully automatic 'in-situ' functional test of all detectors, even whilst cargo is present in the holds.

The unique properties of bulk cargoes call for due precaution when transporting. Certain types of coal for example could also cause liquefaction due to their moisture content. Classified as Materials Hazardous in Bulk (MHB) it



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can emit methane gas, which is explosive, so there is a requirement for surface ventilation and due to the moisture content exothermic oxidation can occur in ambient temperature creating heat further leading to combustion. Cargo corrosion occurs when certain types of coal react with water, producing acid which corrodes the vessel's structure also producing gases such as hydrogen.

The UK P&I Club has highlighted the need for gas detection onboard bulk carriers and their regular service and calibration emphasising SOLAS Chapter VI, reg. 3 concerning the carriage of cargoes in relation to oxygen analysis and gas detection equipment. When transporting coal methane, oxygen and carbon monoxide it need to be monitored in the holds and confined spaces. When loaded, bulk cargoes can react with oxygen in the air causing the oxygen content levels to be reduced, asphyxiating crew on entry as it cannot be detected by sight or smell. Martek Marine has a range

of portable gas detectors with the ability to self-calibrate onboard eliminating the logistical nightmare of sending ashore regularly for testing.

The need for policy makers, trade associations and authorities to educate, inform and uphold standards, to adhere to SOLAS principles is greater now than ever. Intercargo, the trade association representing the interests of the bulk shipping industry, launched in the wake of these disasters the "Intercargo Guide for the Safe Loading of Nickel Ore".

Nicky Pappadakis, Intercargo chairman stated: "this Guide complements the already excellent advice and good work of P&I to raise awareness and define testing and analysis requirements. It also has the ambition to help encourage dialogue within the exporting countries to enable shippers to address shortcomings in processes, to re-double efforts to ensure documentary processes are truthful and accurate and to encourage shipowners to undertake basic due diligence on safety

processes of the shipper prior to accepting the cargo.

We feel that such matters are worth addressing - not just to preserve life at sea, but to ensure that this burgeoning trade can be serviced by owners making informed choices about what constitutes 'responsible'".

Concluding with: "we are asking for all partners to consider loading procedures more responsibly and to ensure that they comply with what is already a legal requirement within the IMSBC Code.

A growing number of shipowners have already expressed unease about carrying cargoes that may liquefy - our aim is to address the problem and stop seafarer deaths before the momentum of unwillingness to carry becomes unstoppable. We now need to use the IMSBC Code to define responsible owners, shippers, and proper processes".

Until these standards are adhered by all owners and authorities there will continue to be more losses and casualties. **NA**

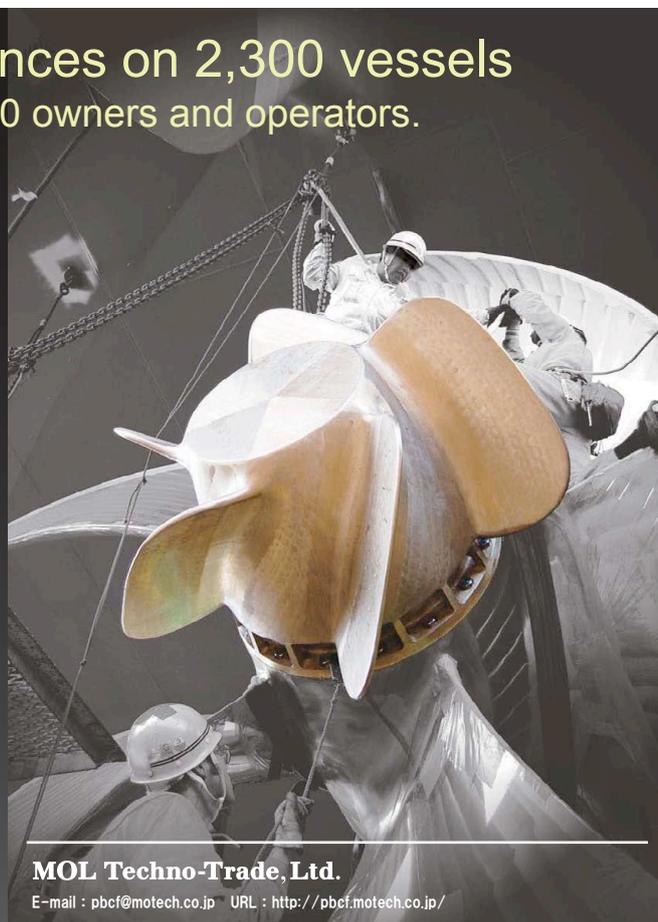
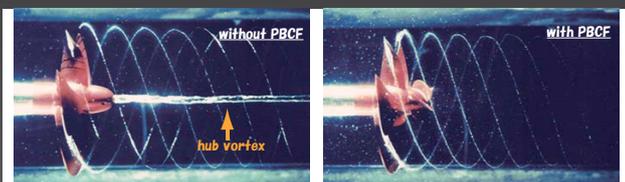
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MacGregor unlocks cargo carriage potential

Finnish-based Cargotec MacGregor has extended its product range for cargo handling and the movement of freight

One of the latest products that MacGregor has introduced to the market is its A-class lashing bar, which is set to make it possible for new and existing containerhips to employ an external lashing system; compared with an internal system, external lashings improve stack weight distribution, which can lead to a ship carrying more containers.

MacGregor's A-class lashing bar is one way of unlocking the considerable amount of unexploited cargo carrying potential on many container ships, claims the company.

"It is amazing how big an impact the choice of lashing system has on true container capacity," says Magnus Ahlström, lashings expert and key account manager, MacGregor, he adds: "With an optimal lashing system you have the potential to carry hundreds of extra containers. It is therefore surprising that most new container vessels are built with a 'standard' internal lashing system."

According to Cargotec an internal lashing systems acts on the compression side of the container stack while an external lashing system acts on the lifting side.

Essentially, this means that an external lashing system reduces the compression forces and can, therefore, increase the stack's centre of gravity. Hence, a container stack secured with external lashings has much more flexibility in weight

distribution and can carry heavier and potentially more containers compared to a stack with internal lashings.

In the right circumstances, the rule of thumb would be one more container for every stack," says Ahlström.

Until now, an external lashing arrangement has been challenging to accomplish due to vessel design. The criteria for its use are dependent on a number of factors including the lashing bridge height, the longitudinal distance between containers and lashing bridges, and, most critically, a transversal gap between containers of at least 38mm. Without the right combination of these factors, there is the potential for interference between lashing bars and turnbuckles; therefore internal lashing was previously the only practical possibility.

"We faced the fact that it is impossible to adjust the container gaps, which are often only 25mm, and that we had reached the limit of what we could do with our 'old' external lashing bar," explains Ahlström.

"The market needed a new lashing bar to meet the challenge of bigger container vessels with higher lashing bridges and we wanted a wider operational range to include vessels with, for example, a 25mm transversal gap or with previously incompatible lashing bridges.

The A-class lashing bar allows external lashing systems to be employed on vessels where it would formerly have been considered



Per-Erik Nilson explains the advantages of MacGregor's latest crane control system

impossible. For conversion to an external system, little or no modification work is necessary to the eye plate arrangement on the lashing bridges, but strength calculations, for lashing bridges and hatch covers are to be considered due to increased loading capacity.

The A-class lashing bar has a diameter of 23mm and is forged and heat-treated to the highest quality standards, which delivers a safe working load (SWL) of 25tonnes. The lashing bar has been class-approved and tested in service.

Further to this, Cargotec MacGregor has also developed more crane control features for its cranes that the company says will enable faster, safer and closer lifts. The two new control system features will allow a single operator to control two separate cranes in a team lift, while the other refines the anti-collision separation between adjacent cranes.

The improvements have been added to its CC3000 control system for its range of deck cranes. The 'Auto Team' and 'Clearkeeper' functions both expand operational capabilities and can be implemented on new MacGregor cranes equipped with the latest version of CC3000. It is also possible to update older cranes equipped with this control system to incorporate these functions.

MacGregor offers better stowage with its latest lashing bar





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- **Efficient Bulk Carrier Designs – Setting the Bar (Deltamarin, FIN)** Starting from scratch; tough performance goals; cooperation is the key; the results
- **ENERCON E-Ship 1 – A Wind-Hybrid Commercial Cargo Ship (ENERCON, GER)** Energy efficient ship design; Flettner-rotors; evaluation of Green-Shipping innovations
- **HYUNDAI LNG Carriers – Now and in the Future (KOR)** Design development of LNG carriers; MEGI fuel supply systems; comparison of various propulsion systems
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Efficient Ship Operation and Efficiency Conversions

- **Mærsk Line's Efficiency Initiatives (DEN)** Performance measurement vs. performance management; retrofitting existing fleet vs. ECO-newbuildings; holistic approach to ship efficiency
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- **Laurin Maritime – Benefits of Energy Management (SWE)** Benefits achieved by energy management; practical use of Marorka System; measuring success of energy saving initiatives
- **Sustainable Cruise Shipping and Holistic Quality (AIDA, GER)** Background of AIDA's energy saving approach; where do we stand, 3-litre-ship; technology measures e.g., LNG, emission control, coating, etc; other measures, e.g., routing, schedule optimization, etc
- **Zero-Emission Design Concept for a Scandlines Ferry (FutureShip, GER and Scandlines, DEN)** Zero emission technologies; fuel saving technology; Fehmarn belt ferry; ship design for 2017
- **High Performance Hull Coatings – Market View (Jotun, NOR)** Hull coatings market situation; measurement of impact of hull coating systems; work on hull performance measurement standard
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- **First Results of Energy Saving Measures Implemented Onboard Existing Container Ships (CMA-CGM and Hydrocean, FRA)** Evaluation method; hull cleanliness influence; local optimisation of forebody; influence of energy saving devices & engine related parameters

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September 23

9:00 – 10:00

Registration and Welcome

10:00 – 17:30

Presentations

19:00

Conference Dinner with Keynote Speaker

September 24

9:00 – 13:00

Presentations

13:00 – 14:30

Farewell Buffet

Conference Fees:

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“The better our crane control systems are, the greater the productivity of the crane,” says Per-Erik Nilsson, marketing and sales director for MacGregor Cranes. “If we can deliver faster, safer and more accurate cargo handling capabilities, our customers will benefit from improved port turnaround times. In some cases, they can perform more complex lifts than previously possible. For example, big and bulky project cargo will be loaded and discharged much faster having these features installed.

“It has always been possible to operate twin cranes – two cranes on the same foundation – in team with one operator. But, to operate two separate cranes with only one operator is a real breakthrough and significantly extends a crane’s, and therefore a vessel’s, capabilities.”

Automatic control of separate cranes is also possible by the CC3000’s ‘Auto Team’ function for team lifts. “With the CC3000 control system running in Auto Team mode, lifts are faster and safer than with two separate operators using manual controls. Auto Team also makes it possible for two sets of twin-cranes to be operated, which means that one operator can control four cranes,” Nilsson notes.

“The operator controls the master crane in the usual way and the slave crane follows automatically, keeping the hook-to-hook distance constant throughout the entire operation. The master crane uses measured angle rates to calculate the drive commands for both cranes. This means that the special ‘team beams’ that are sometimes used during manual team lifts are not needed in Auto Team mode.”

Before a team lift can start the cranes need to be positioned correctly. The lift lines are attached to the cargo; the lift wires of both cranes are tensioned and the load is lifted and balanced. The position of the cranes is then calibrated. Auto Team mode can now be engaged and the lift commenced; the distance between the crane hooks and the rotation of the cargo is maintained during the team lift operation.

Lift data is displayed on a screen in the operator’s cabin; it is also possible to use an external display for supervising the operation from the ship’s bridge. The display provides information about weight, outreach, lift height and lift speed for both cranes. Auto Team has a safety system for avoiding and dealing with overload situations. It provides

on-screen information on how to prevent and balance-out Team overload conditions.

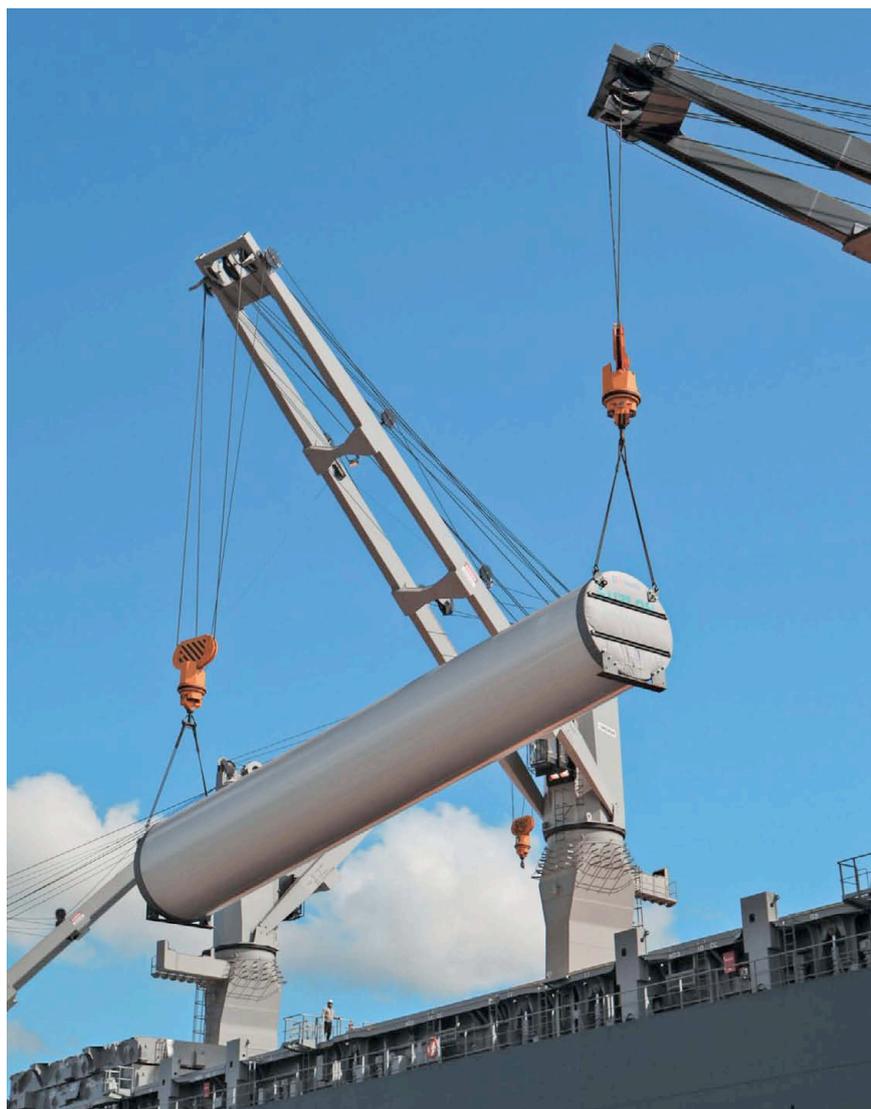
“To run the Auto Team function, both cranes must be equipped with a CC3000 control system. In addition, there must be load cells on both cranes, communication cables between the cranes and encoders for all crane motions,” explains Nilsson.

MacGregor’s second CC3000 advance is Clearkeeper, to prevent collisions between adjacent cranes. Based on an earlier anti-collision system for dynamic obstacles, Clearkeeper allows cranes to work closer together, while maintaining a safe separation. The previous system used a ‘stop wall’ between the cranes, while Clearkeeper employs a ‘safety box’ around the crane and its jib,” Nilsson says. “Clearkeeper makes sure that the boxes of adjacent cranes do not overlap with each other.

“Clearkeeper is very similar to the normal anti-collision system in terms of encoders and alarms, but instead of having a defined stop-zone, it calculates a safety box around each crane jib and crane housing. This expands the cranes’ operating parameters, and ultimately improves cargo handling rates. In addition to the calculated no-go areas, there are also precautionary approach zones where luffing and/or slewing speed is automatically reduced. Clearkeeper can also be used to avoid static obstacles,” he adds.

“Again, to run these functions the cranes have to be operating with a CC3000 control system. In addition, there must be effective communication between the cranes in the system, all of which must be equipped with correctly installed and calibrated encoders”. *NA*

Lifting to new heights: MacGregor’s CC3000 offers more for clients



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Liebherr steps into the virtual world

German-based crane manufacturer Liebherr has launched its range of maritime crane simulators

The simulators have been modelled on Liebherr software and cranes and are expected to increase port safety and produce better productivity by providing Liebherr crane users with a training solution. However, simulators for cranes have been becoming popular among other manufacturers employing this technology for their cranes.

Marcel Flir, product manager ITM (Information Technology Machine) Liebherr-Werk Nenzing GmbH, comments about this recent trend says that: “Driving factors for this are certainly the lack of operators in certain regions, too few training facilities and the development of technology as well as the various advantages offered by simulator. The rapid development of simulation indicates that it will be possible to substitute on-crane training in the future. Besides, the training on simulators will be much more efficient than it would be possible with on-crane training.”

The development of this advanced training tool has been driven by Liebherr’s experience in its crane driver training. The range of simulated cranes includes ship-to-shore, rubber-tyre gantry, mobile harbour and offshore cranes.

“The demand and also the use of simulators is increasing. Originally developed for the airplane industry, the Liebherr crane simulator concept is new to the lifting business. We offer our customers crane training to benefit from its various advantages: simulators are globally recognised for increasing safety (especially in challenging and extreme solutions), higher turnover and more training efficiency”, Flir notes.

The virtual environment means that damage to maritime equipment and injuries to port personnel are eliminated. Because training does not interfere with day to day port operations and is relatively inexpensive, trainees can spend extended time in the virtual environment, learning instinctively how to react to unexpected situations. This naturally increases safety in real cargo and container handling.



Inside of Liebherr simulator

A major benefit of simulator training is the ability to simulate harsh environmental conditions when required. This allows both experienced operators and trainees to gain valuable experience operating under challenging conditions in a safe environment. The resulting increase in operator skills allows for safe and productive crane operation under similar conditions in the real world, boosting port productivity. For example, even though it may be a calm and sunny day, the trainee can practise cargo handling in harsh weather conditions such as snowfall, heavy winds, torrential rain and high waves.

The sophisticated LiSIM environmental and physics engine allows for an unprecedented level of detail and realism. Thanks to this non-destructive virtual environment, the operator has the opportunity to learn the operational boundaries of the crane without any consequences, gaining useful experience for highly efficient crane operation.

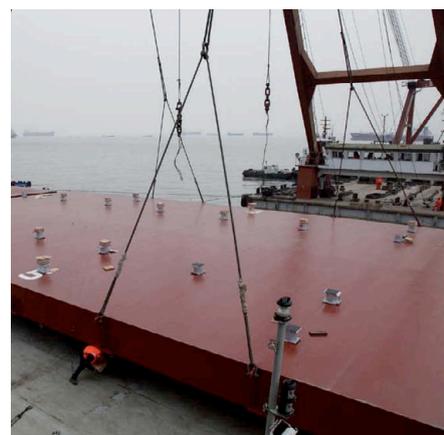
“Simulators are useful training tools for any type of crane. However, they are intended for cranes manufactured by Liebherr. Currently, the Liebherr simulators are available for a broad range of its maritime cranes, including offshore cranes, mobile harbour cranes, ship-to-shore cranes and rubber-tyre gantry cranes. In the future, Liebherr will also offer simulators for its ship cranes and also for its construction machinery”, says Flir.

The installation of Liebherr drive systems, software and hardware gives the user a realistic training experience. The Liebherr drive systems reproduce all crane movements exactly both in space and in real-time, says the company.

“The current range of available features covers numerous requirements, which vary from country and business field. So there’s training for beginners as well as for highly experienced operators available tailored to local requirements. The visualisation is nearly photorealistic and the calculation of the physics very precise. It is possible to reproduce specific port conditions so the simulation may be set in exactly the same virtual port environment the crane operator is used to in real operation.

“There are several training modules available, e.g. ‘load management hook’ – with a load on the hook, moving the load from one location on the ground to another; ‘load management container’ – with a spreader connected to the rotator, picking up 20/40ft container and moving it around another container following a specific sequence / path; bulk material handling (just to mention three of the offered training possibilities).

“However, beyond the training of special applications there is room for customised development, which has high importance for Liebherr”, notes Flir.



You know our name, we know about your business

Throughout the maritime world, the MacGregor brand is familiar to everybody who has anything to do with merchant, offshore or naval ships, working on board or in a port or terminal. Our equipment for handling marine cargoes or offshore loads has been designed by engineers who understand your business, and will be supported wherever the ship happens to be.

Benefit from generations of MacGregor experience to maximise your ship's productivity, minimise its environmental impact and extend its profitable service lifetime.

MacGregor is part of Cargotec. Cargotec's class B shares are quoted on NASDAQ OMX Helsinki.

Feature 4 | CARGO HANDLING

Trainees benefit from the ergonomically designed driver's cabin and control panel. The motion platform ensures that the driver in a Liebherr simulator cabin experiences realistic movement, which mimics precisely the response and feel of a crane-mounted driver's cabin and seat. Full High Definition flat screen monitors and high quality surround sound speakers reproduce the views and sounds typically experienced in the cabin.

Liebherr simulators are available in three configurations. The classroom solution can be integrated into existing training centres with the display, seat and controls mounted on a base and a display frame. The space-saving cabin solution ensures that the driver becomes familiar with controlling the crane in a real-life environment. The easy-to-transport containerised solution houses the simulator in a 40ft container and features a training room, utility room and cabin simulator. Each of the three models is equipped with multifunctional instructor stations. *NA*

Liebherr simulator aims at providing a safe training environment



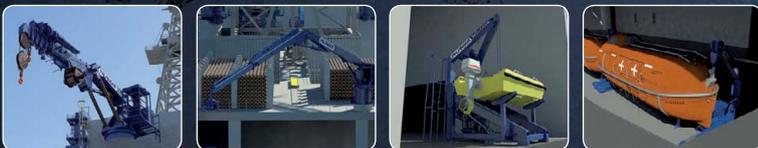
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Langh hooks up

Finnish-based cargo solution provider Langh ship cargo solutions has introduced its latest container system for the better handling of containers

The latest containers are equipped with hook lifting, which has been developed to improve efficiency in handling containers from ships and also on land.

“Often the on-carriage of tank containers meant for transportation by sea is quite expensive on land, as the need for special lifting equipment makes the handling of the containers difficult,” says product manager, Markku Yli-Kahri.

The containers are tailor-made to meet with customer requirements. The 20ft Hook lift / ISO containers enable fast and efficient operation in both and land and sea transport. The container can



Langh ship cargo solutions introduces its latest container solution

be equipped as a machinery container, barrack, office or other purpose unit.

Laura Langh, commercial manager, Langh notes: “This type of lifting system is quite common in northern Europe, especially in Finland.” The system was

originally adapted for a customer who asked for this type of system to be installed on containers that they had ordered. The system has now been introduced to the market with flexible and tailor-made designs. *NA*

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HELKAMA

Busy year for building on past success

German shipyard Meyer Werft has won significant new orders that builds on its existing orderbook. The yard has been busy in 2013 both building and receiving more orders for cruise ships signalling an upturn in the cruise market

Meyer Werft has been keeping itself busy this year with more orders for cruise ships. Currently, the German shipyard has three cruise ships on order that will be delivered over the next five to six years.

“Five or six years ago the market [shipbuilding] was growing more. Some areas in Europe are still are growing. It will still be a growing market for the next 10-15 years. The level has been a little less around 8-9% per year compared to the 12% we saw in 2001. Today we see levels of around 3-5% growth, but nevertheless the market is still growing”, says Peter Hackmann, head of corporate communications, at Meyer Werft.

Hackmann notes that the shipbuilding market is a very competitive market, especially with the event of the recession. He says that Meyer Werft has developed the strategy of making lots of investments in the yard with improving facilities and in educating and improving the skills of its workforce.

“We have not just been focusing on the cruise ship market, but also with our sister



RCCL signs up Meyer Werft to build its Quantum class

company Neptun Werft looking at other markets such as the river cruise market, which is a very interesting market at the moment”, he adds.

With last years’ *Costa Concordia* incident Hackmann highlights that this did not have any impact on the shipyard or the cruise ship industry. “The cruise market is still strong, even with the *Cost Concordia* incident we cannot see any repercussions. Cruise companies are now trying to appeal to the younger generation by adding more onboard”, he says.

After the *Costa Concordia* accident Hackmann pointed out that questions were being asked about the safety of larger ships. He notes that at the time the industry was starting to think that “small is beautiful”. “How large can we go? That is down to the economy of scale. At one point the curve will start going down, but we do not know when this is. The 100,000- 180,000gt size vessels are a good and interesting in an economical way. Since the Oasis class vessels have been delivered we have seen nothing smaller than 60,000-70,000gt being delivered in the last couple of years. It is hard to say what size of vessels will be in the future”, says Hackmann.

Meyer Werft’s landmark delivery for this year has been Norwegian Cruise Line (NCL) *Norwegian Breakaway*. Heralded as one of the largest cruise vessels in the

world, it entered service in April this year. *Norwegian Breakaway* is the first of two Breakaway class ships the Papenburg-based shipyard is building for Norwegian Cruise LineNCL.

Norwegian Breakaway uses the latest engine technology, a diesel-electric pod drive system, improved hydrodynamics as well as effective energy saving, heat recovery or ballast water treatment give the vessel its ecofriendly edge, which the company has highlighted will significantly reduce operating costs.

“We see today that ship operators want to save fuel. The challenge for us was to improve the costs, fuel efficiency and features onboard. For this hydrodynamics that optimising the vessel has been used with improved technology in HVAC, glass for the windows and new solutions in the galley. The ship has been fitted out with common rail engines with an expected fuel saving of 40%”, Hackmann claims.

Norwegian Breakaway’s interior has been given an innovative design that includes The Waterfront and 678 Ocean Place with three unique decks for dining, entertainment, along with an aqua park and rope course and a salt room in the luxurious spa. *Norwegian Getaway*, the sister ship, will launch in Miami on 1 February 2014.

TECHNICAL PARTICULARS

Norwegian Breakaway

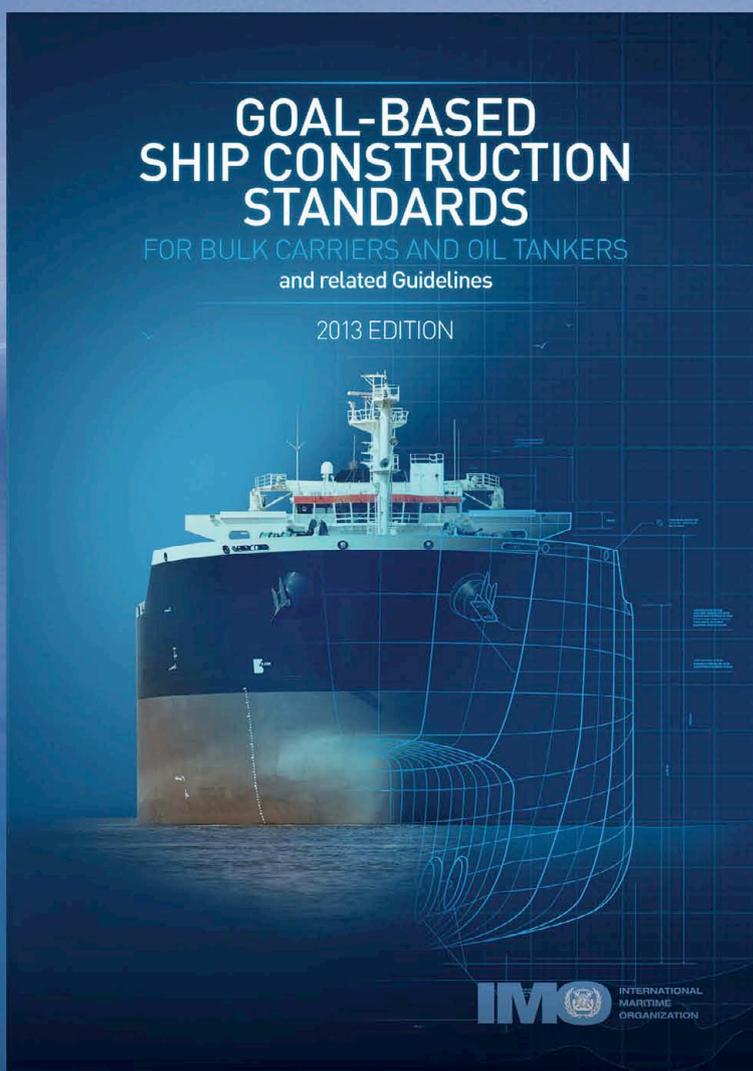
Gross tonnage:	146.600GT
Length overall:	324,00m
Moulded breadth:	39,7m
Number of decks:	18
Draught:	8,30m
Engine output:	62.400kW in total
Propulsion power:	35.000kW
Speed:	21,5knots
Number of passengers:	4,000
Number of passenger cabins:	2,014
Number of outside cabins (including suites):	1,508
Number of inside cabins:	506
Crew:	ca. 1.600
Flag:	Bahamas
Classification:	DNV

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In July Meyer Werft received an order for a second "Breakaway Plus" cruise ship for delivery in spring 2017. Along with the first Breakaway Plus ship, which is scheduled for delivery in October 2015, these two new vessels will be the largest in the line's fleet at approximately 163,000gt and 4,200 passenger berths each and will be similar in design and innovation to the line's current Breakaway class. The combined contract cost of the two Breakaway Plus class ships is approximately €1.4 billion (US\$1.8 billion).



Norwegian Breakaway delivered earlier this year

RCCL

Royal Caribbean Cruises Ltd (RCCL) has also signed a contract with Meyer Werft shipyard to construct a third Quantum-class cruise ship for delivery in mid-2016.

The company recently unveiled details of this new class of ship where it said that the new design included an advantageous configuration, which includes a greater proportion of higher priced staterooms and that it will achieve some of the greatest energy efficiencies at sea.

The yet-unnamed Quantum-class vessel will join the RCCL fleet, alongside *Quantum of the Seas*, which will make its maiden voyage in 2014, and *Anthem of the Seas*, scheduled to debut in 2015.

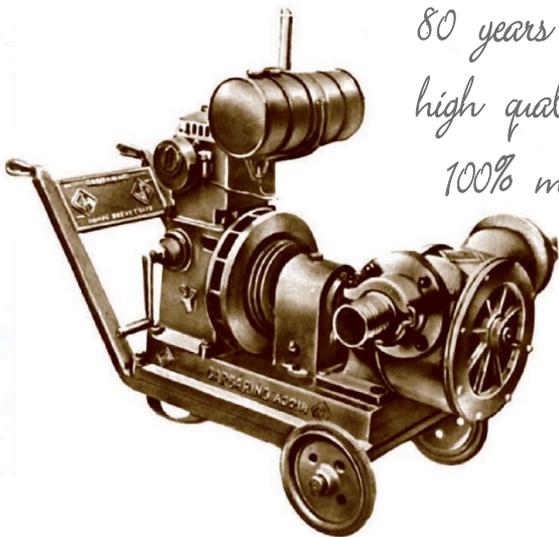
The Quantum ships span 16 decks, encompass 167,800gt, carry 4,180 guests at double occupancy and feature 2,090 staterooms. The Quantum vessel will have onboard features, such as a skydiving experience, venues including the largest indoor sports and entertainment complex at sea with bumper cars, roller skating and more; and the cruise line's largest and most advanced staterooms. These new, larger staterooms enable innovation in design, storage and comfort, including the industry's first interior staterooms with Virtual virtual Balconiesbalconies, ensuring that every stateroom on *Quantum of the Seas* will have a view.

The first of a total of 74 blocks of the new cruise liner weighs 430tonnes. This and the keel-laying marks the official start of construction of the *Quantum of the Seas*. For the time being the 167,800-gt *Quantum of the Seas* is the biggest ship the shipyard has built so far.

Both new ships for RCCL will set standards due to their design, a parachuting simulator, bumper cars, virtual balconies and many more innovations. **NA**



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German shipowners look through green-tinted glasses

German shipowners are focusing on the green initiative to keep business going

The current challenge for German shipowners is keeping up with an ever changing market and the 'green' regulations coming through, meaning that they are required to spend more on their vessels at a time when there is hardly, or indeed, any financial backing to help owners implement the technology that is required.

Wolfgang Hintzsche, marine director, German Shipowners Association remarks that: "In the last 10 years Germany has built up a fleet that has been supported by the KG subsidies, but this form of investment is now out of date and owners now have to look to at alternative ways of financing." He also adds that like many governments there are no subsidies in place for shipowners to fall back on, only for some of the shipyards to keep them going through this difficult period.

The container market, which has borne the brunt of the economic impact in Germany, has seen many shipowners go bankrupt and especially some trying to adapt by expanding into other markets. Hintzsche notes that Hapag Lloyd and Hamburg Süd are the two main German container lines currently operating. Some German companies have diversified into the offshore market, Hintzsche optimistically adds that the offshore market will sustain the German market industry through the economic recession.

The recent delivery of the first Maersk Triple E vessels, do not worry the German shipowners. Hintzsche remarks about the recent newcomer: "There is only a market for larger vessels if the cargo is there. *Emma Maersk* has been running at a loss. Containerships need to run at 85% capacity for them to be productive. Yes, these vessels may be good for the larger ports, which have the facilities and doing the long runs from China to Rotterdam, but we still have vessels that operate in the Baltic and from East Europe to West Europe, etc. The market is still very large."

The era of the eco-ship has also most



Wolfgang Hintzsche, marine director at German Shipowners Association highlights the challenges faced in today's market

certainly arrived with classification societies presenting designs to owners for modern environmentally friendly vessels that have the potential to save costs for shipowners, also proving to the world that shipping can do its bit to clean up its emissions. German shipowners have been keen to respond to the designs on the market, but the major stumbling block is cost. German shipowners are caught in a perfect storm where they would like to order new green vessels that can reduce costs, but cannot raise the finance to order the ships.

"German owners support eco-designed vessels. Hamburg Süd recently had a delivery of a 9,000TEU eco-designed container ship that will have 30% fuel savings per year. We are now stepping back away from speed, where ships were being built for 26knots. We are now going back to economical designs, where the hull form can be optimised to create better efficiencies because the focus isn't on how fast it can go. In the future I think we will see the eco-ship powered by LNG", says Hintzsche. "These new generations of ships, however, will not be built in Europe though, but in China and Korea because the price is so much cheaper."

The ships of the new "Cap San" class for Hamburg Süd carry 9,600TEU. The class represent the current status of marine engineering and the application of modern environmental technology.

The "Cap San" newbuildings are designed for a speed of 21knots, while most other container ships of this size operate at significantly higher speeds. The use of smaller main engines reduces engine output to a maximum continuous power rating of 40,670kW. This improves performance in the partial-load operational range, which in turn has a positive effect on fuel consumption.

Additionally, Hamburg Süd undertook optimisation of hull shape with the ships of the "Cap San" class. Here, the yard's standard hull was optimised using cutting-edge calculation and simulation methods by FutureShip, a subsidiary of Germanischer Lloyd (GL), which results in significant energy savings. Furthermore, the use of a common rail propulsion system has been installed, as are modern waste disposal and ballast water treatment methods, which, in part, even go beyond the globally applicable standards.

Going green is one of the main focuses for German shipowners, with the most prominent green measure being is the ballast water management convention (BWMC). Still un-ratified, the BWMC has left German shipowners in a quandary about installing systems. "Why install something that costs so much, when it has not been agreed", points out Hintzsche.

At MEPC 65 a draft Assembly resolution was agreed recommending that ships not be required to install a ballast water management system (BWMS) until the first renewal survey after entry into force of the BWMC. Hintzsche expects that the BWMC will be ratified this year and will come into force at the end of 2014 for implementation at the start of 2015, but expects that there will be enormous pressure to get the world fleet fitted with systems in time. **NA**

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Nordic Yards expands expertise with ice

Nordic Yards is known for building ice class vessels, but with its recent partnership with Krylov State Research Centre the yard is looking to extend that knowledge further

Nordic Yards signed a cooperation agreement with the governmental Krylov State Research Centre in St. Petersburg earlier this year. The joint research projects will include innovative products and solutions in the shipbuilding and offshore field, including Arctic regions. With the establishment of an “Arctic Centre”, a common expert platform is being created for specialists from both companies.

“Krylov does not have a yard and we do not have our own test facility for these types of projects. We will be able

to see our results in practice”, highlights Guido Schulte, head of project design department, Nordic Yards.

At the new Arctic Centre there will be an ice tank where testing for projects can be carried out. Schulte noted that there are several Russian exploration projects planned to be carried out at the facility.

With the Northern Sea Route (NSR) opening up for more commercial use, owners are still wary about operating in this area because of the safety challenges involved. There is significant risk running in this climate, Schulte notes, but these risks are being addressed by the industry.

Adding to the risk is that charting the NSR has not been fully completed, due to the lack of vessels transiting the passage, but this is also something that is now under way.

“The transit of this area will increase, due to the cost savings that can be achieved by operating through this passage”, says Schulte. And with this will come the demand for more specialised ice class vessels. At the moment the NSR sees 46 transits a year, all of which are escorted. Schulte notes there is space in the market for these more highly specialised ice class vessels. **NA**



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Becker, with a twist

Becker Marine has received further orders for its energy-saving Becker Mewis duct and twisted fin rudders

Becker Marine introduced its latest Becker Twisted Fin last year as a new energy-saving device tailor-made for container ships and other types of fast vessels with bulbous stern.

Since then the company has signed a contract with Hamburg Süd. The Hamburg-based shipowner ordered Becker's energy-saving device for fast types of ships as retrofits for a series of 10, 7,100TEU container vessels. Seven of these ships have already been fitted with the Becker Twisted Fin and are back in

service. The fuel saving potential of the device has been verified during a model test with an average saving of 3.5%, notes the company.

Both STX and GNS have ordered the Becker Mewis Duct for it bulk carriers. STX Marine on behalf of the owner STX Pan Ocean ordered 10 Becker Mewis Ducts for its 57,000dwt open hatch bulk carrier newbuildings, under construction at STX Offshore & Shipbuilding sites in China and Korea. *Nordic Wuhan* for GNS, which is also to be fitted with a Becker Mewis Duct, is the

first vessel out of a series of six 35,000dwt bulk carriers of the latest Seahorse design by Grontmij.

Becker Marine will also be fitting its Twisted Flap rudders onboard the two TUI cruise vessels, *Mein Schiff 3* and *4*. The Becker rudders have been employed on these vessels because high-lift rudders have been requested to provide enhanced manoeuvring performance and efficient course keeping for the 295m-long and 35.8m -wide cruise ships. **NA**

GEA updates portfolio

GEA has recently made upgrades to its range of plate heat exchangers for high-level output

The models in GEA's NT range of heat exchangers cool the light fuel oil while in use; in addition, they can be scaled allowing them to achieve a smaller footprint.

These heat exchangers will provide dedicated cooling of engine fuel, which reduces the viscosity to below the level recommended by engine manufacturers. Additional benefits see the fuel burn with less residue and emit less pollution. These plate heat-exchanger coolers are externally installed, which also enables them to be retrofitted with no modifications of the engine necessary.

The NT range was especially developed for the requirements encountered at open sea. Its Optiwave technology assures maximum flow

over the entire plate surface and guarantees high heat-transfer rate, the company remarks. The plates are positioned exactly with the aid of GEA PosLoc technology, to ensure the seals remain fully functional for longer.

"Thanks to the PosLoc system the plate heat exchanger has a self-centring plate pack that ensures optimum positioning of the plates within the pack to guarantee increased process reliability: The result is a stable, perfectly aligned plate pack, with gaskets positioned precisely and remaining functional for a longer time" says Gaby Fildhaut, senior manager press relations, GEA.

Due to the easier location of the plates, production downtime has been reduced

to a minimum; the benefits of the new plate positioning is also passed down in the case of maintenance being required.

Adding to this, GEA has also developed its Bloksma NF oil cooler designed to cool oil in turbines, diesel or gas powered engines, gearboxes, bearings, hydraulic and refrigeration plants or compressors.

"The Bloksma NF has a smaller footprint but, has a higher cooling effect. The plate fins on the oil-conducting tube bundles offer a large heat-transition surface and enable enhanced heat transfer. The GEA Bloksma NF oil cooler is available in four model sizes and operates with water and oil pressures up to 30bar," says Fildhaut. **NA**

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INVESTING IN THE ORIGINAL PAYS OFF

RWO revamps its OWS

RWO redesigns its SKIT/S-DEB oily water separator (OWS) for new market demands

The RWO SKIT/S-DEB is a suction type oily water separator working with a coalescer combined with a second-stage emulsion-breaking oil and hydrocarbon polisher.

In the first step the coalescer removes oil and oily debris from the water. The periodical and automatic back-flushing keeps the coalescer surface clean and offers long-lasting operation without attendance and lowest maintenance.

After this first filtration step the water is led to the emulsion-breaking oil and hydrocarbon polisher to remove emulsions and potential residues, which may have survived the first filtration stage.

To further extend the operating life of the de-emulsifier, an automatic bypass has been fitted to the separating system. The oil content measuring device (OMD) periodically checks the water quality of the first-stage separator. If the processed water is below the set maximum value, the de-emulsifier is bypassed until the set alarm is activated. This process control leads to a considerable life cycle prolongation.

The use of filter cartridges give good performance during their life cycle while, for example, loose filter material often blocks when the surface is contaminated and pressure reaches limit values. The system comes equipped with coal cartridges and fixed filter material, the company highlights that changing of full cartridges is easy to handle and possible at any time.

The SKIT/S-DEB fulfils the 5ppm-standard and has also been confirmed by Germanischer Lloyd (GL), Lloyd's Register (LR) and DNV. Thereby the unit achieves high purity levels of <1ppm oil content in the effluent under IMO test conditions and conforms to the Alaska Rules.

In 2012 RWO started a redesign process of its oily water separator



BWO updates its oily water separator

product that had been on the market since 2004.

Peter Wolf, director of sales & marketing at RWO, accompanied the redesign process and says about the initiation: "Since its invention, the RWO oily water separator has undergone several redesigns and optimisations. The new design is just a logical consequence in a series of continual product developments.

As a first step, evaluations started within the company. A thorough look at several past contracts showed the most required construction changes that should be part of the new model. Furthermore, customer's feedback influenced the planning and also defined the aim that the new model should achieve.

In a concerted action the design of the original SKIT/S-DEB was completely dismantled. For the rearrangement of the single components several requirements were defined to keep the core processes running and the top results untouched by the redesign.

The new oily water separator now provides a much better overview for operators and crew. Several

measurements are gathered on a single gauge board and every measure is easy to find; information about the actual performance of the unit can be seen at a glance.

In addition, the control valves for hydraulic circuits have been grouped inside the control cabinet, which saved unnecessary electrical cables and reduced the number of lines inside the unit. Besides these changes to ease operation and maintenance, the new model SKIT/S-DEB is equipped with a further improved back-flushing mechanism that came into force with the redesign. Originally simply pumped into the coalescer, the flushing water cleaned the coalescer surface properly and lengthened the life cycle of the unit. With the new design the flushing water is ejected tangentially, which leads to an even better cleaning effect.

One of the most significant changes the redesign achieved is the reduced space demand of up to 30%. This has been achieved as a result of various small actions, such as the rearrangement of single components.

The redesign of RWO's SKIT/S-DEB always acted on the maxim of enhancing the performance while optimising the design. Any improvements in space and installation at the cost of performance were not an option at any time. In line with that, the crucial processes certified by various societies had to be saved in any case to retain the key factors of the system's success.

More than 200 units of the upgraded version of RWO's SKIT/S-DEB have been made and sold, while some customers still stick to the former version to achieve uniformity in equipping planned ships. But, even these long-standing RWO customers were keen to get the new design as soon as their own plans allowed it, highlights the company. The new version is available in all established capacities from 0.1tonne for yachts to 10tonnes for bigger vessels and drilling rigs. **NA**

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Germany holds its ground for 2013

The recession has seen many German maritime companies change tact in order to stay in business, Verban für schiffbau und Meerestechnik (VSM) highlights the challenges of 2012 and strategies for going forward

German companies operating in the shipbuilding and ocean industries were largely able to defend their market position in the year under review. Despite intensified international competition, they were able to seize opportunities in high-growth market sectors. German shipyards generated a total revenue of €5.1 billion (US\$6.7 billion) and were thus able to exceed last year's performance by 10%. While domestic revenue further decreased by 11% to €1.4 billion (US\$1.8 billion), exports increased by 22% to €3.7 billion (US\$4.9 billion) and accounted for 72% of the total revenue. Above all, the delivery of ocean-going ships with an export share of 97% contributed to this increase.

After comparatively weak first three quarters of 2012, the sales figures in the fourth quarter improved significantly due to several large projects. With 18 orders for new vessels in 2012, the number of orders did not match those of the previous years, but tied with last year's performance at 495,000CGT. Together with the two new platforms ordered for offshore wind farms, not subject to CGT measurements, the value of the incoming orders for the entire year reached €3.4 billion (US\$4.5 billion), exceeding last year's value by 11%.

Despite the cancellation of eight orders of 89,000CGT valued €0.4 billion (US\$0.5 billion), resulting from a company's insolvency, the total value of order books rose by 1.2% to €8.5 billion (US\$11.3 billion) for a reduced number of 55 vessels with a tonnage of 1.5 million CGT.

Based on order value, the order books at the end of 2012 were focussed on passenger ships and yachts (80% of orders). The offshore market had a significant share of orders with ships (seismology research vessels; wind farm, erection and service vessels) and transformer/converter platforms for wind farms.



Dr Reinhard Lüken, general managing director, VSM highlights the plight of securing financing in Germany

Although nearly all German shipyards operating in the repair and conversion sector rated the growth in order numbers in 2012 positively, the total value of repairs, conversions and maintenance (including boat building) carried out in 2012 decreased by 8% to €722 million (US\$961 million). The average for the past three years has amounted to approximately €750 million (US\$998 million), around 20% lower than in 2008/2009. This is due to the shipping companies' difficult financial situation triggered by low revenues and high fuel costs. Repair and maintenance work has thus tended to be limited to what is strictly necessary.

German shipyards are particularly well-positioned for large conversions of ferries and passenger ships, as well as drilling and production vessels for the offshore oil and gas industry. Expectations are high for repair and conversion shipyards' opportunities

to diversify their activities in order to include retrofitting of ships, which are necessary to meet international climate and environmental protection regulations.

German inland vessel construction was also affected by the continuing low demand from the inland navigation industry in 2012. Nevertheless, the demand for special-purpose vessels from public customers and the continuously strong demand for innovative passenger and river cruise ships led to a good annual yield overall.

Additionally, many shipyards have concentrated on demanding conversions, modernisations and repairs of the existing fleet over the past few years. The shipyards operating in inland vessel construction delivered 40 inland vessels in the year under review, with a value of about €224 million (US\$298 million). In 2012, orders of 33 units valued at around €245 million (US\$326 million) were newly acquired. Among them were eight river cruise ships and six passenger vessels and ferries of various designs. In addition, six cargo ships / freight-carrying vessels, as well as 13 harbour, authority and special-purpose vessels were ordered.

The maritime equipment industry was only partially struck by the lower demand for new construction in the global market in 2012. Companies with large export shares in the leading shipbuilding countries in the Far East were initially able to maintain high production levels. However, meanwhile the low new order volumes have fully reached the supply chain. Domestically, some companies are severely feeling the consequences of local shipyard insolvencies. According to VDMA estimates, revenues for those firms operating primarily in the engineering and electrical engineering sectors had already decreased by 11% from their 2008 peak of €12.9 billion

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MARINE COATINGS RISK MANAGEMENT COURSE 13 September 2013, London

The failure of marine coatings can lead to significant in-service costs for owners and operators of marine vehicles (ships and offshore structures). A good understanding of the problems that can result in coating failure is essential if the risks associated with marine coatings are to be avoided or mitigated and coating in service performance improved hence reducing operating costs through life and the potential for claims.

Marine Coatings – Risk Management is a one-day course for all maritime professionals who are involved in managing risk associated with marine coatings - legal advisors, insurance claim managers, P&I Club claim advisors, ship superintendents and coating professionals and of course naval architects, marine engineers. No previous knowledge of coatings and the processes involved is required.

On completion of the course, the maritime professional will be familiar with basic coating terminology and risks, understand how these risks can be assessed and/or mitigated, and in the event of a coating failure understand the basic procedures required to assess the cause of the failure and the validity of any claim for compensation.

www.rina.org.uk/marine-coatings-course

RINA-QinetiQ Maritime Innovation Award

Innovation is key to success in all sectors of the maritime industry, and such innovation will stem from the development of research carried out by engineers and scientists in universities and industry, pushing forward the boundaries of design, construction and operation of marine vessels and structures.

The Royal Institution of Naval Architects – QinetiQ Maritime Innovation Award seeks to encourage such innovation by recognising outstanding scientific or technological research in the areas of hydrodynamics, propulsion, structures and material which has the potential to make a significant improvement in the design, construction and operation of marine vessels and structures.

The Award is made annually to either an individual or an organisation, in any country. Nominations for the Award may be made by any member of the global maritime community, and are judged by a panel of members of the Institution and QinetiQ. The Award will be announced at the Institution's Annual Dinner (tbc).

Nominations are now invited for the 2013 Maritime Safety Award. Individuals may not nominate themselves, although employees may nominate their company or organisation.



QinetiQ

- Nominations may be up to **750 words** and should describe the research and its potential contribution to improving the design, construction and operation of maritime vessels and structures,
- Nominations may be forwarded online at www.rina.org.uk/MaritimeInnovationAward or by email to MaritimeInnovationAward@rina.org.uk
- Nominations should arrive at RINA Headquarters by **31 December 2013**
- Queries about the award should be forwarded to the Chief Executive at hq@rina.org.uk

(US\$17 billion) to €11.5 billion (US\$15.3 billion) in 2011. The domestic share of incoming orders increased to 29%. Including other European orders, nearly 60% was allocated to Europe. The share of orders from China and Korea has decreased to 23% over the past years.

Overall, the German shipbuilding and ocean industry was successful during the 2012 period despite the worst crisis of the post-war era. The challenges of the current market are gigantic, highlights VSM. Despite all adversities, VSM and its Member Companies are confident and convinced that shipbuilding and ocean technologies in Germany are well-positioned. "The crisis requires companies to quickly adapt to changing conditions. We have done just that by recalling our classic strengths as German Mittelstand," says VSM chairman, Harald Fassmer.

The German shipbuilding industry has abandoned the production of standard vessels in reaction to the tremendous market upheavals and has focussed on complex high-end special-purpose vessels. This requires sophisticated technical solutions and generally calls for one-off production. For this reason, both engineering capacities and acquisition efforts increased substantially.

At the same time, cost pressure is further increasing due to intensified competition. Competitors, often with substantial government support, particularly in Asia, are now also aiming at market niches. Those shipyards, erected at breath-taking speed can no longer utilise their excess capacity due to the current low demand. Many would be forced to close as failed investments, but state aid measures, threatens to delay the necessary capacity adjustments - with considerable ramifications to the international shipping and shipbuilding markets.

A subsidy race is not the answer, highlights VSM. However, to maintain competitiveness for the long term maritime growth markets, Germany must shape smart framework conditions.

It is from this background that VSM derives its key requirements for the

industry: strengthening innovation capacity, securing competitive financing, reducing costs in Germany.

Strengthening innovation capacity

Promoting innovation is the key to accomplishing technological diversification in German shipbuilding to develop new products and production methods, believes VSM. It has called for immediate action with regard to the innovation promotion programme: fast approval of already filed projects, safeguard sufficient budget and secure a reliable and workable European legal basis after the planned expiry of the so-called "shipbuilding framework" end of 2013.

During its eight-year duration the previous innovation programme triggered a genuine innovative impetus, with a capital expenditure of over €600 million (US\$798 million). At the same time, only a maximum of 20% of that is backed by the federal government and regional government authorities. With the help of these investments, many innovative products and processes could be successfully marketed and produced revenues of approximately €6 billion (US\$7.9 billion). "Our calculations have shown that approximately 30% of final shipyard revenues return as tax and social security funds. In light of these figures, the increase in federal and regional funding to €35 million (US\$46.6 million) per year from 2014 onwards as requested by the VSM, would be money well spent," says Fassmer.

In addition, innovation also largely depends on qualified junior staff. From the industry's perspective, the federal government and regional authorities should work towards safeguarding the expanded training capacities for shipbuilding, and should devise training opportunities efficiently, notes VSM.

Securing financing

Offering attractive financing terms to potential customers could be the key to future acquisitions. The availability of pre-delivery financing through loans and guarantees is equally important for shipyards.

Major problems for ship-financing banks caused by troubled shipping customers with ships mostly constructed

in Asia, have caused a credit crunch on an unprecedented scale.

Public institutions' guarantee instruments thus play a key role. As such, an adjustment of the existing instruments should reflect the modified product portfolio, and the discrimination against domestic orders must be done away with. The terms of the existing instruments must also be put to the test, e.g. the terms of the CIRP programme. "An OECD-compliant instrument to safeguard fair competition must not be allowed to create competition disadvantages through additional surcharges!" explains, VSM general managing director, Dr Reinhard Lüken. "In addition, public financing institutions must ultimately spring into action to achieve the successful organisation of sustainable energy, including in the offshore sector, by directly engaging in pre- and post-delivery financing for specialist vessels and offshore structures."

Reducing costs in Germany

Additional strain on companies, e.g. through high cost resulting from the law on sustainable energy (EEG), high financing fees, or industry surcharges for temporary labour cannot be counterbalanced in the short-term by increases in productivity, VSM points out. "As an industry with long project durations, we need a reliable framework so that everything runs smoothly from the signing of the contract to delivery. We cannot pass on sudden additional expenses caused by political decisions to our customers," states Lüken.

Sharply rising fuel prices and tightened environmental standards are opening up many opportunities for cleaner, safer and more efficient products in the manufacturing industry. New markets, like production of conventional and renewable energies and resources in the offshore sector, are developing dynamically. The maritime know-how and engineering excellence in shipbuilding and marine technology that are broadly available in Germany form the perfect conditions for converting this enormous potential for growth into economic prosperity, VSM concludes. **NA**

RINA - Lloyd's Register Maritime Safety Award

The Institution believes that the safety of both the seafarer and the maritime environment begins with good design, followed by sound construction and efficient operation. Whilst naval architects and other engineers' involved in the design, construction and operation of maritime vessels and structures do not have a patent on such issues, nonetheless their work can make a significant contribution.

The Institution also believes that it has a role to play in recognising achievement of engineers' in improving safety at sea and the protection of the maritime environment. Such recognition serves to raise awareness and promote further improvements.

The Maritime Safety Award is presented by the Institution, in association with Lloyd's Register, to an individual, company or organisation which has made a significant technological contribution to improving maritime safety or the protection of the maritime environment. Such contribution can have been made either by a specific activity or over a period of time. Nominations may be made by any member of the global maritime community, and are judged by a panel of members of the Institution and Lloyd's Register. The Award will be announced at the Institution's Annual Dinner.

Nominations are now invited for the 2013 Maritime Safety Award. Individuals may not nominate themselves, although employees may nominate their company or organisation.



Lloyd's
Register

Nominations may be up to 750 words and should describe the technological contribution which the individual, company or organisation has made in the field of design, construction and operation of maritime vessels and structures.

Nominations may be forwarded online at www.rina.org.uk/MaritimeSafetyAward

or by email to
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Nominations should arrive at RINA Headquarters by 31 Dec 2013

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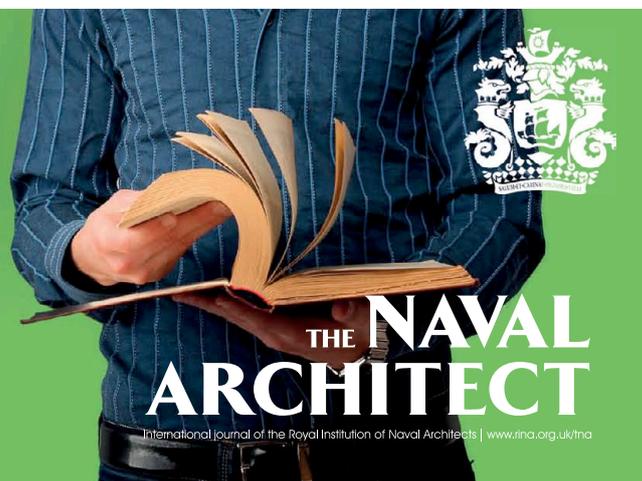


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www.rina.org.uk/conferences

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www.impalondon.com

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www.southamptonboatshow.com

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www.ibexshow.com

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E-mail: amt13@ncl.ac.uk
http://conferences.ncl.ac.uk/amt13

September 18-21, 2013

MTB Workboats, international conference, Athens, Greece.
www.coplandevents.com

September 23-24, 2013

Ship Efficiency, international conference, Hamburg, Germany.
www.ship-efficiency.org

September 24-27, 2013

NEVA, international conference, St Petersburg, Russia.
www.transtec-neva.com

September 24-26, 2013

ICCAS 2013, international conference, Busan, Korea.
E-mail: conference@rina.org.uk
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www.seatrade-europe.com

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www.maritime-conferences.com/ASRANet/

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www.middleeastworkboats.com

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www.otcbrasil.org/2013

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www.workboatshow.com

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www.reedexpo.com/en/Events/2671/KORMARINE

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international conference, Minato-Ku, Tokyo, Japan.
www.rina.org.uk/MORE_symposium.html

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ML Ferries Conference & Expo, international conference, Seattle, USA.
www.marinelog.com

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www.maritime-conferences.com/ASRANet/

November 5-8, 2013

Europort Rotterdam, international conference, Rotterdam, The Netherlands.
www.europort.nl

November 12-14, 2013

Clean Gulf, international conference, Tampa, USA.
www.cleangulf.org

November 13, 2013

Deep-Ocean Science, Technology and Conservation 21st Century Opportunities and Imperatives, Seminar, Hertfordshire, UK.
www.eeesta.org.uk/seminars.php

November 19-21, 2013

METS, international conference, Amsterdam, The Netherlands.
www.metstrade.com

November 20-21, 2013

International Conference on the Design, Construction and Operation of Passenger Ships, international conference, London, UK.
www.rina.org.uk/passenger_ships.html

December 3-6, 2013

Marintec, international conference, Shanghai, China.
www.marintecchina.com

December 12-13, 2013

ICSOT India, international conference, Kharagpur, India.
www.rina.org.uk/ICSOT_india.html

January 4-12, 2014

London Boat Show, international conference, London, UK.
www.londonboatshow.com

The Royal Institution of Naval Architects Design & Operation of Wind Farm Support Vessels

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Call for Papers

Offshore wind turbines are becoming an important resource of renewable energy, and large scale investment is creating extensive wind farms off the coast of many coastal European Countries. This has led to the need for specialised vessels that install and service the turbines.

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By Chris Thomas

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John Lingwood

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By Fred Walker FRINA

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By John E Robinson

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Inland:	£124	£217	£309	
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Period	12 Months	24 Months	36 Months	Ref: J8
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Europe:	£63	£109	£159	
Overseas:	£70	£119	£173	

Human Factors

26-27 February 2014, London, UK



Call for Papers

The work of naval architects and marine engineers directly influence the operability and safety of the vessel and the seafarer. Decisions made at the design stage can influence human behaviour and health. And an improved understanding of ergonomics by engineers can 'design out' hazards and prevent incidents, both to the individual and the vessel.

With ever more complex systems and technology, greater improvements in safety can be achieved through a better understanding of human/system dynamics. A greater awareness of the role played by management structures, culture, procedures and regulation in safe and effective operation is also important to the effective running of the vessel and wellbeing of the crew.

This conference aims to bring together international specialists and professionals including designers, ship operators, seafarers, equipment manufacturers and regulators to highlight how an improved understanding of human factors can reduce costs and improve safety. RINA invites papers on all related topics, including:

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30 September - 2 October 2013

Abu Dhabi National Exhibition Centre, United Arab Emirates

Seatrade Middle East Workboats



& Offshore Marine



GLOBAL WORKBOATS TECHNOLOGY FORUM
EXHIBITION FOCUS POWER HOURS
GOLF TOURNAMENT NETWORKING
RECEPTIONS

This September 30 - October 2nd 2013 will see a refreshed and restyled platform for Seatrade Offshore Marine & Workboats. The three-day programme will deliver an international exhibition; opening ceremony; a high-level Industry Outlook session; Power hours targeting the Caspian and Africa; a new Global Workboat

Technology Forum; panel debates; the Smit Lamnalco Golf Day and networking events.

Renamed and rebranded to include Offshore Marine, the event embraces the growing markets of the Caspian and Africa and discusses in open forums how to do business and the challenges faced.

By focusing less on old-style conference sessions and more on doing business on the exhibition floor - complemented by open discussion forums - Seatrade Offshore Marine & Workboats is ideally positioned for decision-makers and industry specialists who want to network and do business.

For full details and to contact us, visit www.middleeastworkboats.com

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