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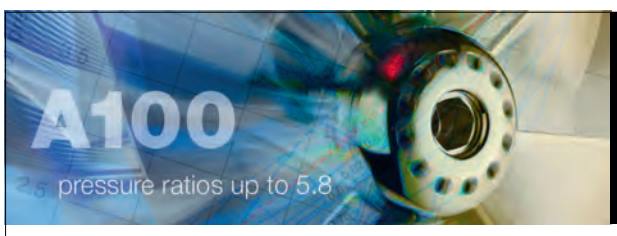

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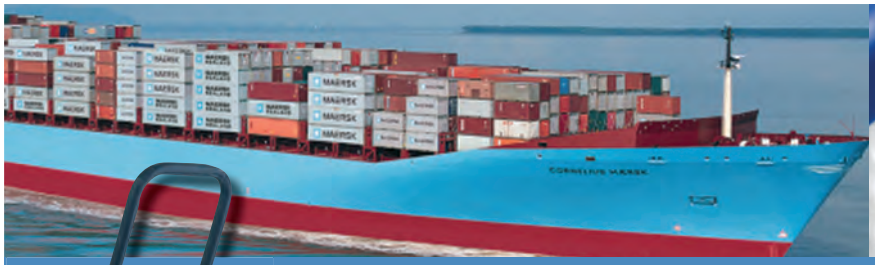
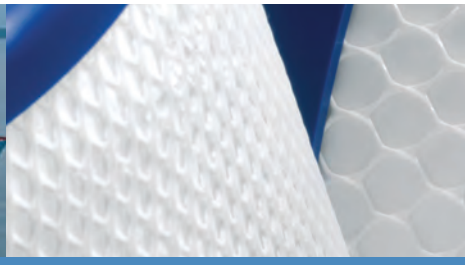
On-line Edition

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





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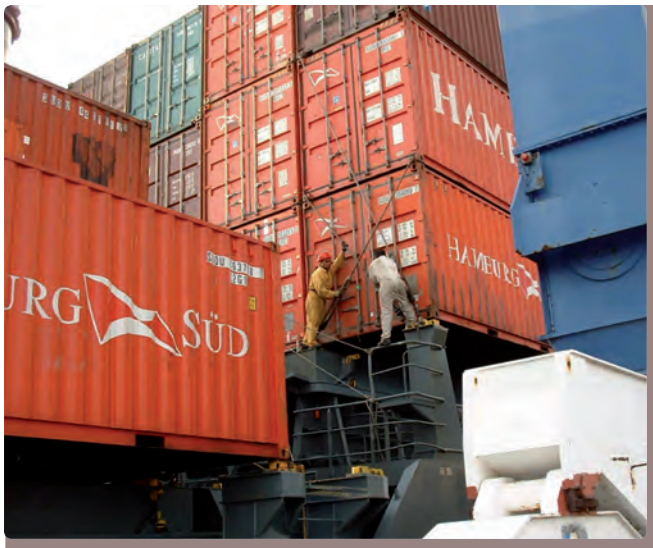

Lloyd's Register stretches its lashing point

Container lashing work is known to be hazardous. Greater focus needs to be put on securement, access and egress at the initial design stage.

Figures surrounding the death and injury to dockers and seamen working to lash containers onboard ships are sparse. There is no wish by the industry to wash its dirty linen in public.

There is no point, however, in the industry maintaining a silence in an attempt to sweep an important issue such as safety at work under the carpet. And Lloyd's Register has picked up the baton as far as docker safety is concerned by looking at what designers can do to protect stevedores working the ships. For too long it seems that the container industry has ignored the accidents that can and do occur onboard box ships in port and the class society along with DP World and other organisations has decided to do something about it.

This issue was first brought to light some years ago by the International Cargo Handling and Co-Ordination Association (ICHCA) which prepared a lengthy set of rules on the issue. ICHCA's document was considered by some to be too lengthy and complicated. Experts from Germany produced a new paper of more manageable size and this was presented to the International Maritime Organization (IMO) some two years ago.

Discussions at the IMO led to certain elements of the original ICHCA document being reinstated into the IMO's burgeoning rules document and the debate continued until the IMO's version looked remarkably like the complex ICHCA guide.

Seeing the failure that was apparent the chairman of the then DSC13 ended the debate and asked delegates to return the following year with a workable solution. Since then the issue has been stalled and until the terminal operators took it upon themselves to protect their workers by safety auditing ships that called at their facilities before they allowed the vessels to be worked by stevedores.

Clearly that leaves some terminal operators, the ones who could enforce safety at their terminals, at a disadvantage as their ship operating customers could take their custom elsewhere. Terminal operators could be especially vulnerable in a recession. The situation the industry is now facing means the level of cargo has shown a marked and significant decrease and ship operators as well as terminals are looking to maintain cargo levels.

> "If there was ever an issue that needed the IMO, with its international brief, to step up and make its mark it is this issue of safe working for dockers and seamen on containerships"

Lloyd's Register's initiative then, while not entirely new, has met with significant provisional backing from all sides of the industry, including ICHCA, at least two major container shipping operators, equipment manufacturers, terminal operators and trade unions.

It is this broad support that could give the issue new impetus at this month's DSC. In addition it is hoped that some terminal operators will give practical support. In effect this could mean charging vessels with the Lloyd's Register's Ergonomic Container Lashing (ECL) notation less in terminal fees and offering these ships priority handling, because they are considered safe.

Few would dispute the merits of this case. If the working conditions that dockers all over the world had to endure were taking place at a building site or at some land-based work place in Europe or other first world country they would immediately be closed down.

Ships, however, are often governed by laws made in flag states whose ability to enforce the statutes, if they have them, is negligible. So even though these vessels are docked at European or USA ports the ship is considered to be foreign territory.

If there was ever an issue that needed the IMO, with its international brief, to step up and make its mark it is this issue of safe working for dockers and seamen on containerships. Terminal operators and docker's employers, as stevedores are often subcontracted, must sweep away the veil that continues to obscure the numbers of workers that die or who are seriously injured working ships.

Pressure must be applied to the appropriate regulatory bodies to make the rules that will enforce changes on the design of new ships and to modify existing vessels that will make them safer to work. Over to you IMO. *NA*

Regulation

IMO voluntary GHG deal…

The International Maritime Organization's (IMO) Marine Environment Protection Committee MEPC59 agreed a voluntary package for the reduction of greenhouse gases (GHG) by world shipping in July.

An IMO briefing said: "The agreed measures are intended to be used for trial purposes until the Committee's sixtieth session (MEPC 60) in March 2010, when they will be refined, as necessary, with a view to facilitating decisions on their scope of application and enactment. The measures include:

- interim guidelines on the method of calculation, and voluntary verification, of the Energy Efficiency Design Index for new ships, which is intended to stimulate innovation and technical development of all the elements influencing the energy efficiency of a ship from its design phase; and
- guidance on the development of a Ship Energy Efficiency Management Plan, for new and existing ships, which incorporates best practices for the fuel efficient operation of ships; as well as guidelines for voluntary use of the Ship Energy Efficiency Operational Indicator for new and existing ships, which enables operators to measure the fuel efficiency of the ship.

Market based instruments for mitigating the GHG emissions were also discussed at length and the IMO said it would discuss these possibilities further at MEPC 60 in March 2010. The IMO will report the outcome of MEPC 59 to the Copenhagen Climate Change meeting in Copenhagen in December.

Regulation

Ballast treatment resolution on its way

The International Maritime Organization's (IMO) Maritime Environment Protection Committee MEPC 59 has agreed to prepare a draft resolution to be presented to MEPC 60 in March next year that will encourage member states to ratify the Ballast Water Management (BWM) Convention.

To date some 18 countries have ratified the Convention and they represent 15.27% of the world's merchant fleet. However, the Convention cannot be enforced until 30 states, comprising 35% of the world's fleet, ratify it.

The MEPC 59 agreed to give final approval to four more BWM systems, bringing the total of approved systems to 10.

"While acknowledging the difficulties, the Committee agreed that ballast water treatment technologies were available and were currently being fitted onboard ships and confirmed that sufficient ballast water management systems would be available to ships constructed in 2010," said an IMO statement.

Newbuildings

Crisis of confidence

Moore Stephen's survey of confidence within the maritime industry showed a surprise rise, albeit by the smallest of margins during the period from March to May. However, there were high levels of concern about the glut of newbuildings that will continue coming onto the market over the next year.

"Average confidence levels expressed by respondents, on a scale of 1 to 10, was 5.5, compared to 5.4 in the previous survey in February 2009. Owners, managers and charterers all exhibited a small increase in confidence in connection with the shipping markets in which they operate. Confidence among brokers, meanwhile, was marginally down, and the lowest among all categories of respondent. Geographically, the highest confidence level was recorded by respondents in Asia," said a Moore Stephens statement.

According to Moore Stephens the area of most concern involved the newbuilding market. "The weight of the orderbook is a serious problem," said one respondent, while another noted, "There is more toxic debt on the newbuilding front still to be revealed". Other comments included, "The glut in the newbuilding orderbook exerts strong downward pressure on confidence levels", and, "We are doomed by the oversupply of ships".

Regulation

Elemento portante standard

Italian class society Registro Italiano Navale (RINa) introduced new voluntary standards that will govern ships connecting to port-based electricity while in dock, reducing air pollution.

The High Voltage Shore Connection (HVSC) notation sets standards for the design of newbuilding ships or for the modification of existing ships so that power can be safely supplied from the shore to operate the vessel's machinery while it is in port. This allows the diesel generators to be shut down, considerably reducing greenhouse gas emissions.

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Safety

Interferry rep in IMO FSA review

Interferry, the ferry shipping trade association, has nominated Stena Rederi technical director Harry Robertsson as its representative on an International Maritime Organization (IMO) expert panel that was formed to review Formal Safety Assessments (FSA).

The assessments are on ro-pax, cruise, container and LNG vessels and are carried out under the European Commission's recently completed SAFEDOR project.

Studies by SAFEDOR (Design, Operation and Regulation for Safety) are being scrutinised by a Group of Experts drawn from 14 member governments and five organisations with consultative status at the IMO – Interferry, IACS, Intertanko, the Oil Companies International Marine Forum and the Cruise Lines International Association.

Their brief is to review the validity of SAFEDOR's methodology, assumptions, scenarios and input data and to consider the proposed risk control options, which focused on damage stability/survivability, fire protection and evacuation arrangements.

The expert group submitted an initial report to the IMO's Maritime Safety Committee after meeting for the first time between 28 May to 3 June during the MSC 86 session in London. A further meeting is planned in November, also at IMO headquarters, before reporting to MSC 87.

Design

Graduate designer class act

Coventry University graduate, 23-year old Alastair Callender, has developed a 'green' superyacht, that he named *Soliloquy*, that will be wind powered and use solar and Hybrid Marine Power (HMP). Mr Callender took his design to Visioneering who brought it to life with the construction of an intricately detailed 1:48 scale model.

Visioneering said: "Mr Callender's superyacht concept has pushed the boundaries of design with its renewable and hybrid-electric energy, rigid-wing rig and architecturally dynamic form. The eco-friendly materials and construction techniques, allied with the latest technology solarsails, as well as a visually striking superstructure, make this an ultra environmentally friendly, yet highly desirable superyacht."

As an engineering consultancy which has been brought in by major automotive and aeronautical manufacturers to assist with new product development, Visioneering was able to provide the expertise, equipment and materials needed to create a scale model visualisation of Mr Callender's superyacht.

Brian Horner, chief executive, of Vioneering with Alastair Callender and the 1:48 scale model of the *Soliloquy*.

Guidance

Alternative ship design

Germanischer Lloyd's (GL) new Guidelines for the Analysis of Alternative Ship Design and Arrangements (V-2-1) come into force in mid-July. Alternative ship design and arrangements are solutions which deviate from the prescriptive requirements of SOLAS regulations. Nevertheless they are suitable to satisfy the intent of the respective regulations.

Alternative designs and arrangements include a wide range of measures, such as alternative shipboard structures and systems based on novel or unique designs, as well as traditional shipboard structures and systems that are installed in alternative arrangements or configurations. Alternative design and arrangements as specified in SOLAS can be focused on particular systems, subsystems or individual components, or can extend to the whole concept of the ship.

Hence, alternative ship designs offer shipyards the opportunity to create more competitive ship designs, such as the introduction of additional features and new design ideas that in the past could not have been implemented. Such designs and arrangements may be accepted, if by means of risk assessment it can be demonstrated that a novel design offers an equivalent level of safety as the requirements of existing SOLAS regulations.

The application of alternative design and arrangements has been open with respect to fire safety (SOLAS chapter II-2) since 2002. From July 2010 the application will also be opened to machinery and periodically unattended machinery spaces (SOLAS

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chapter II-1, parts C and E), electrical installations (SOLAS chapter II-1, part D), as well as life saving appliances (LSA) and arrangements (SOLAS chapter III). Alternative design and arrangements for selected design aspects and installations may be accepted, for a particular ship or group of ships, provided that the alternative design and arrangements meet the intent of the requirements concerned and provide an equivalent level of safety to the relevant SOLAS requirements.

The process for analysing safety equivalency for alternative designs and arrangements is outlined in the International Maritime Organisation (IMO) circulars MSC/Circ. 1002 and MSC.1/Circ. 1212. This process typically is based on a holistic risk assessment, which to date has not been widely used in the maritime industry. Hence, GL decided to share its experiences from consultancies in various alternative design projects by providing these guidelines to owners, yards and designers.

The GL guidelines for the Analysis of Alternative Design and Arrangements contain recommendations and requirements for the application of the process of alternative design and arrangements. The objectives of these guidelines are:

- to provide an overview on the objectives and working tasks of the alternative design process,
- to provide recommendations on the implementation of the alternative design process and
- to make it possible for our customers to apply the alternative design process efficiently in order to take advantage of the new design opportunities that are offered.

For the purpose of usability, in order to avoid having to work with a set of documents in parallel, the GL Guidelines for the Analysis of Alternative Design and Arrangements contain the full text of IMO circulars, which is enriched by comprehensive recommendations for the practical implementation of the individual steps of the alternative design process; hence providing a direct link between IMO recommendations and GL experience.

Shipbuilding

Queen Elizabeth keel laid

On 2 July 2009, at Fincantieri's Monfalcome shipyard the official keel laying ceremony took place of the passenger ship *Queen Elizabeth*, ordered by Carnival group for the Cunard Line. Following the *Queen Victoria*, built at MarGhera shipyard in 2007, the delivery of the new passenger vessel is scheduled for autumn 2010.

Queen Elizabeth will be approximately 294m long and with a gross tonnage of around 92,000tonnes, will be able to accommodate in her 1046 cabins, over 2500 guests in addition to a crew of 1097. She will be one of the largest panamax ships built to date.

This vessel, like *Queen Victoria*, will be the natural development of the concept of the ocean liner in the tradition and style of Cunard. *Queen Elizabeth* will be provided with a large number of luxury suites and mini suites. It will be the second largest ship ordered to date by the owner (following *Queen Mary*).

Since 1990 Fincantieri has delivered 49 cruise ships, of which 46 for the six leading brands in Carnival Group. A further 13 vessels are under construction at the Group's yards for delivery within 2012.

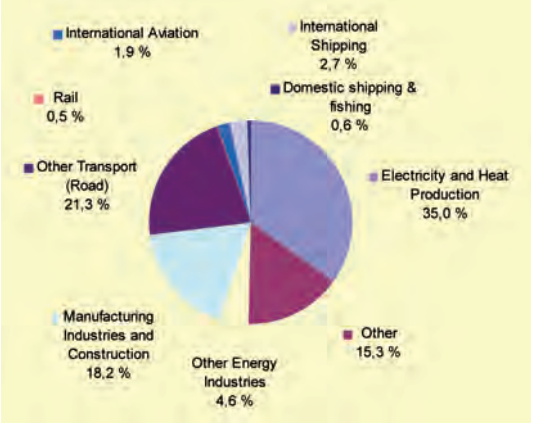
Environment.

Greenhouse gas study

The second International Maritime Organisation (IMO) GHF study 2009, which is the most comprehensive and authoritative assessment of greenhouse gas (GHG) emissions from ships engaged in international trade reached the following conclusions;

- Shipping is estimated to have emitted 1046 million tonnes of CO_2 in 2007, which corresponds to 3.3% of the global emissions during 2007. International shipping is estimated to have emitted 870 million tonnes, or about 2.7% of the global emissions of CO_2 in 2007.
- Exhaust gases are the primary source of emissions from ships. Carbon dioxide is the most important GHG emitted by ships. Both in terms of quantity and of global warming potential, other GHG emissions from ships are less important.

Emissions of CO_2 from shipping compared with global total emissions.



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- Mid-range emissions scenarios show that, by 2050, in the absence of policies, ship emissions may grow by 150% to 250% (compared to the emissions in 2007) as a result of the growth in shipping.
- A significant potential for reduction of GHG through technical and operational measures has been identified. Together, if implemented, these measures could increase efficiency and reduce the emissions rate by 25% to 75% below the current levels. Many of these measures appear to be cost-effective, although non-financial barriers may discourage their implementation.

Shipbuilding

Fears for Polish Yards

A Qatar based investor failed to make the expected payment of 381 million zlotys (US$130 million) for stakes in the two struggling Polish yards in Szczecin and Gdynia. The original deadline was set for 21 July, but this had been extended until 17 August at the investor's request. Aleskander Grad the Polish treasury minister confirmed that the payment was not made by the midnight Monday deadline. "I understand that the previous investors didn't get approval from the institutions backing them," explained Mr Grad adding: "Today it's hard to escape the reality of the worldwide economy".

Another investor, the state run Qatar Investment Authority, is said to have express an interest in buying the two shipyards. Poland must sell the shipyards by 31 August, as part of a deal agreed with the European Union, which had alleged the government gave illegal state aid to the yards. If a deal can not be agreed by then, Poland will demand compensation from QInvest in addition to the deposit paid after winning the original bid to buy the yards. QInvest has already said that it is only acting as an adviser for an unnamed client and is not the buyer itself.

Further background details are given in this issues Poland feature, see pages 128 – 129.

Shipbuilding

End of an era at Odense

Despite a huge effort to improve the Lindø yard's competitiveness with investments in new technology and streamlining of the production, the Danish Odense Steel Shipyard, which is part of A P Moller - Maersk Group has run up very considerable annual deficits and its Board currently believe that it would be impossible to attract orders, which are commercially sound.

In this light the Board of the yard has decided to discontinue the shipbuilding activities, when the contracted 15 orders have been fulfilled. The contracted orders; five bulk carriers, seven ro-ro vessels and three frigates, extend to August 2010, November 2011, and February 2012, respectively. The first redundancies of approx. 175 employees are expected to take place from the end of August 2009.

"We have to realise that it is impossible for Lindø to attract new orders. The Board has therefore decided to make it absolutely clear that Lindø will not be building more vessels, once the contracted orders have been delivered," says Lars-Erik Brenøe, chairman of the board.

With the discontinuation of the shipbuilding activities at Lindø, there is no longer a need for ownership of the Lithuanian shipyard, Baltija Shipyard and has been put up for sale. Danske Markets Corporate Finance will act as Lindø's financial advisor in the sales process. The sale will not have any effect on Lindø's and Baltija's contracted orders. Also the design- and engineering company UAB Baltic Engineering Centre in Lithuania has been put up for sale.

Shipbuilding

Blohm + Voss for sale?

The ThyssenKrupp German management board has reportedly issued a statement informing the works council that it is in early discussions with investors about selling Blohm + Voss ship repairing, ship construction and engineering companies in Hamburg.

Around 1700 workers could be affected by the sale. Herbert Oetting chairman of the works council is reported to have said: "for some months now, there have been several indications that the group might consider disposing of its merchant shipbuilding activities". Naval shipbuilding activities may be excluded from such a sale. Although, the company has declined to comment on these reports it has confirmed that it is holding talks on the best way to address the current shipbuilding condition.

Blohm + Voss is part of the ThyssenKrupp Marine Systems the management holding company. The full group comprises Howaldtswerke-Deutsche Werft GmbH, Kiel, TKMS Blohm + Voss Nordseewerke Gmbh, Emden and Hamburg, Blohm + Voss Shipyards GmbH and Blohm + Voss Repair GmbH, Hamburg, as well as Kockums AB, Sweden, and Hellenic Shipyards S.A., Greece. *NA*

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Offloading meter operations

Italian-based Expro has secured a contract for its PassiveSONAR clamp-on flow meters, worth US$500,000, to Teekay, working in cooperation with StatoilHydro; for shuttle tanker loading and offloading operations in the North Sea.

Expro's PassiveSONAR meters will be used to measure the instantaneous flow rate and provide early warning of any potential loss of containment between the host facility and the shuttle tanker. The PassiveSONAR meters will be positioned immediately inboard the bow of the vessel, where data will be relayed back to the bridge to provide real time monitoring and control of the loading operations.

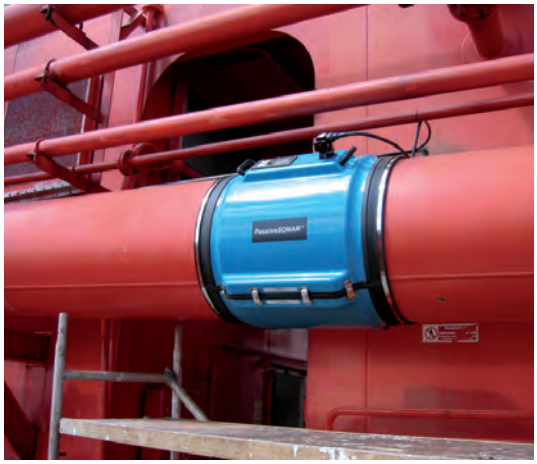
The Expro Meters will be installed during routine tanker offloading operations at various receiving terminals, avoiding any unnecessary or costly delay in the shuttle tanker schedules.

PassiveSONAR can be deployed on new or existing installations and comes in sizes from 20" through to 32", and works in a range of process conditions, flow regimes and pipe sizes. Its applications include wellhead production surveillance, pipeline monitoring, process optimisation and inline production testing.

Benefits of the meter will include; Low cost, Installation without process shutdown, Full-bore flow measurement – no pressure drop, Non intrusive – no pressure tappings, No calibration required, measurement within a multiphase environment.

Expro has further added to its portfolio with the launch of ActiveSONAR, the next generation of clamp-on sonar technology. ActiveSONAR can be retrofitted to a wide range of applications in the upstream and downstream oil and gas industry. The new meters have been designed to address the flow rates and heavy schedule piping encountered in upstream oil and gas applications.

Expro's PassiveSONAR flow meter performs over a range of process conditions, flow regimes and pipe sizes.



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Coatings

International Paint celebrates

International Paint's ongoing programme of investment in R&D continues with the building of a product development laboratory in Singapore. Planned to open early in 2010, the new laboratory will focus on the development of the next generation antifouling and foul release technology.

The new laboratory will be a key part of its network of R&D centres and will employ up to 20 laboratory scientists with the capacity for future expansion.

International Paint celebrates 100th PSPC gap analysis.

Just two years after completing the first PSPC gap analysis in a Chinese shipyard, Lloyd's Register and International Paint has announced the completion of its 100th analysis at STX France Cruise SA, Saint-Nazaire.

Conducted over a two day period by personnel from Lloyd's Register, International Paint and STX France Cruise SA, Saint-Nazaire, the PSPC gap analysis assessed current shipyard coating practices against PSPC requirements. Lloyd's Register and International Paint jointly delivered a presentation to the shipyard senior management and departmental managers on completion of the analysis.

With gap analyses completed in China and Europe, plans are now developing to begin work in the Americas.

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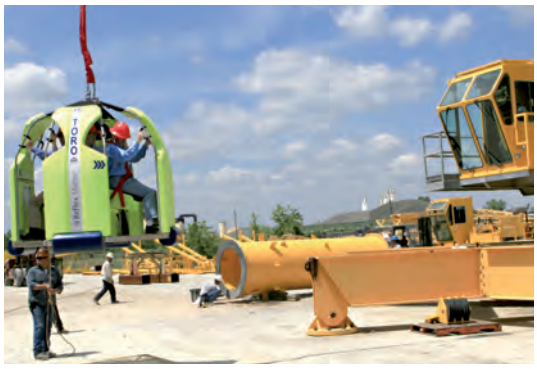
Lifesaving

TORO launched in USA

Reflex Marine has launched its TORO personnel transfer device to the USA market with a demonstration hosted by its service partner, Energy Cranes, at its facility in Houston, Texas.

Developed to be a low cost transfer device to reach a broader market, the TORO transfer device will offer high levels of passenger protection and operational performance.



Reflex Marine launched its TORO personnel transfer device to the US market at Energy Cranes facility in Houston.

The TORO can carry up to four passengers, protecting them from side impacts and heavy landings, and is buoyant and self-righting. The TORO is certified with CE marking and is ABS Type Approved.

Each of the two demonstration sessions started with a presentation on the product and its safety features followed by practical lifting sessions so that the TORO passengers could experience the entry, lifting, landing and exiting procedures first hand.

The demonstration day was attended by key industry personnel. Reflex Marine's US representative, Brian Morr, said: "We have listened to our potential clients in the USA in order to address the needs and preferences of the USA Gulf market. I believe the TORO will be very well-received by USA companies with its key features of ease of use, intuitive ride experience and its excellent safe operating envelope."

Contact Reflex Marine,11931 Wickchester Lane, Suite 100, Houston, TX 77043. USA.
Tel+1 713 589 9436
Fax +1 832 364 6032
E-mail info@reflexmarine.com
www.reflexmarine.com

Ancillary equipment

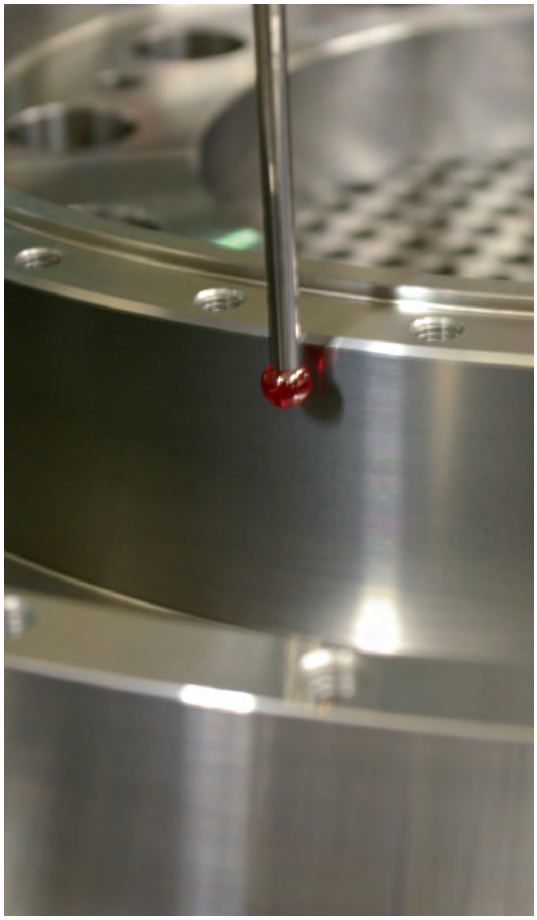
Vdamp gets type approval

Geislinger has received type approval for its recently introduced Vdamp product range by Det Norske Veritas (DNV).

The approval facilitates the use of Geislinger Dampers in 2-stroke applications, where the Vdamp protects the propeller or camshaft from damage by torsional vibrations.

In such applications the damper is a crucial safety element and has to be classified, contrary to 4-stroke engines. Also for these applications the DNV type approval for the Geislinger Vdamp provides a safe feeling, to have made the right choice with Geislinger.

V-damp gets DNV type approval.



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Very reliable torsional vibration calculation models were the base for granting Geislinger the type approval for its Vdamp series.

Geislinger claims to have carried out extensive research and testing on the silicone oils used, with the result of a revolutionary calculation model for viscous dampers. The damper can be optimised in a better way compared to current solutions, to perfectly suit the torsional vibration behaviour of the system.

Contact Geislinger GmbH, Hallwanger Landesstraße 3, 5300, Hallwang/Salzburg, Austria.
Tel +43 662 66999 0
Fax +43 662 66999 40
E-mail info@geislinger.com
www.geislinger.com

Coatings

Hempel extends repair interval

Hempadur Ultra-Strength 47500 is the latest epoxy coating for ship cargo holds with an industry-leading repair interval, developed by Hempel.

The durable coating provides abrasion and impact resistance and will protect ship cargo holds from both mechanical damage and the severe abrasion caused when loading hard cargoes.

With a 10-year repair interval, it will enable shipowners to extend periods between repairs and bring down maintenance costs.

Michael Aamodt, group marine product manager at Hempel, comments: "The cargo hold is exposed to more battering and rough treatment than any other part of a ship, so shipowners need an extremely tough cargo hold coating. Hempadur Ultra-Strength offers better protection than any other epoxy coating. This means it lasts longer and shipowners can save time and money as they have to do less repairs or recoating."

With a high glass transition temperature, the coating will remain hard even when exposed to very warm coal cargoes. 10-year repair interval 75% volume solids VOC compliant (below 250 g/l), Grain certified by Newcastle NHS, Application temperatures: -5°C to 40°C (23°F to 104°F), Dry film thickness: 2 x 125µm, Suitable for: cargo holds, decks, outer hull and other exposed areas, Easy to clean between cargoes.

Contact Hempel A/S, Lundtoftevej 150, DK-2800 Kgs, Lyngby, Denmark.
Tel +45 4593 3800
Fax +45 4588 5518
E-mail hempel@hempel.com
www.hempel.com

Oil discharge monitor

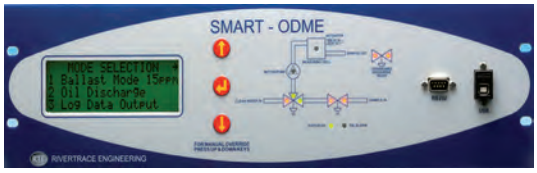
RTE launches Smart ODME

Rivertrace Engineering Ltd (RTE) announced the first orders for its Smart Oil Discharge Monitoring Equipment (Smart ODME) in India and Turkey, and a breakthrough distribution deal in Japan. With three new territories opening up for a technology that offers Port State Control surveyors a full demonstration of a vessel's compliance with stringent ballast discharge regulations.

RTE's Smart ODME incorporates a 'simulation operating mode', is specifically designed to allow shipowners to demonstrate that the ballast water system onboard operates in compliance with discharge limits set out in resolution MEPC 108(49) to PSC.

With International Maritime Organization (IMO) approval secured through Germanischer Lloyd, and type-approval from the USA Coast Guard, ClassNK, Bureau Veritas and the China Classification Society. Many of the 'plug and play' Smart ODME units have been supplied to South Korean and Chinese yards.

RTE's first orders via an Indian yard to supply four



Smart Oil Discharge Monitor Equipment (ODME) that calculates ballast discharge rates.

Smart ODME shipsets have been specified for chemical and oil product tankers under construction at ABG Shipyard Ltd and Modest Infrastructure, ordered through local RTE representative Advanced Materials and Tribology.

Elsewhere, Besiktas Shipyard and Selay Shipyard have specified a number of Smart ODME shipsets, in initial orders for RTE in Turkey, in this case through distributor Delmar Marine.

RTE has reached a formal marketing agreement with marine equipment trading house LGE Japan, supported by a service agreement with MEC Co Ltd.

The Smart ODME is available in a fully electric version for newbuildings, or in a pneumatic version for retrofitting to ships operating under older regulations.

Contact Rivertrace Engineering Ltd, Unit p, Kingsfield Business Centre, Philanthropic Road, Redhill,

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www.rivertrace.com

Ancillary equipment

RWO to install water system

Veolia subsidiary RWO has announced that it is to supply a complete reverse osmosis plant for seawater desalination to the international oil and gas concern Total for its *Girassol* project, off the Angolan Coast. *Girassol* is said to be the world's biggest floating production storage and offloading (FPSO) ship, and is stationed 150km off the coast of Angola in Block 17 of the oilfield.

RWO's desalination plant will be installed aboard the FPSO shortly and will guarantee reliable and independent water supply.

Girassol's reverse osmosis desalination plant will be capable of producing 70,000 litres of drinking water a day and will have very low maintenance requirements.

With dimensions of 300m x 60m x 31m and a storage capacity of two million barrels of oil, *Girassol* is one of the world's largest FPSO ships. The oil is pumped through hi-tech flowlines and at regular intervals offloaded into tankers.

Contact RWO GmbH – Marine Water Technology, Veolia Water Solutions & Technologies company, Thalenhorststrasse 15A, 28307 Bremen, Germany.
Tel +49 421 53705 214,
Fax +49 421 53705 442
www.rwo.de

Water ballast treatment

New strategic partnership

A.P. Moller - Maersk, Skjølstrup & Grønborg (UltraAqua) and DESMI have established a new company, DESMI Ocean Guard A/S, specializing in ballast water treatment systems. The new company is a result of cooperation between the partners on a concept for a new system, which hopes to meets both the International Maritime Organization (IMO) Convention for the Control and Management of Ships' Ballast Water and Sediments and the expected USA Ballast Water Regulations.

The IMO convention requires vessels to clean their ballast water to prevent the transfer of microorganisms from one ocean to another via ballast water which is hazardous for local maritime ecosystems. The convention has to be implemented on all commercial vessels by 2016 at the latest, depending on vessel type.

"We have been able to combine our knowledge of ship technology, water treatment in large scale, and pumping technology which has now resulted in a unique and very sophisticated concept based on proven technology. A clear advantage of our system is that it does not use any type of chemicals, which means there is no pollution as a result of the ballast water treatment," says Christian Ingvorsen, CEO of DESMI Ocean Guard A/S.

"Secondly, the system uses very little energy, which makes it an attractive solution both economically and environmentally," says Mr Ingvorsen, adding that having a reliable, powerful and still low power consumption system based on well-proven components is considered as an important factor for becoming one of the key players in the market for ballast water treatment systems.

DESMI Ocean Guard A/S is in the process of patenting the concept, which will also be subject to an IMO certification process.

Contact DEMI Ocean Guard A/S, Lufthavnsvej 12, DK-9400 Nørresundby, Denmark.
Tel +45 96 32 81 99
Fax +45 98 17 54 99
www.desmioceanguard.com

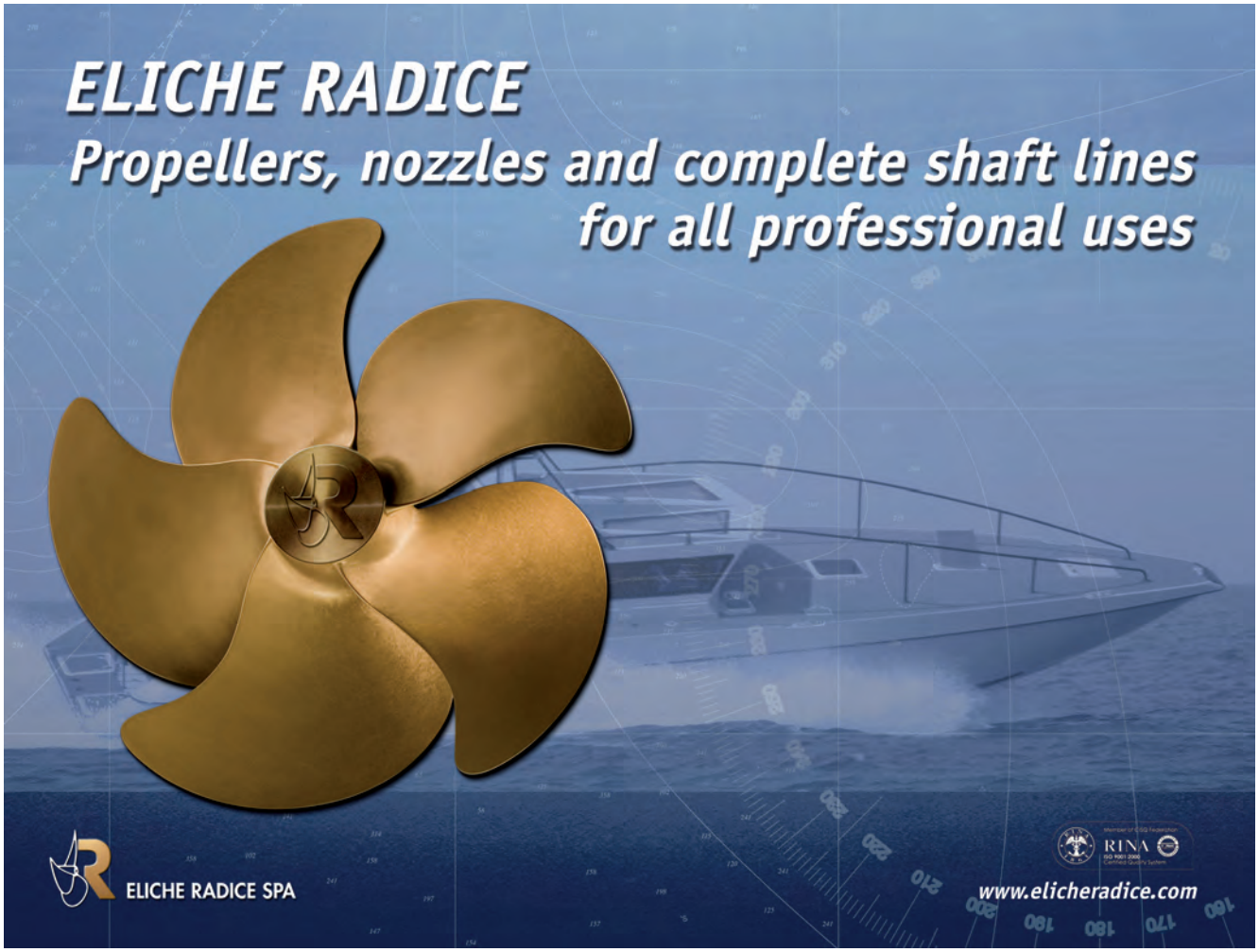
Water ballast treatment

China newbuild contract

Hyde Marine, Inc has won a contract for ballast water treatment system from the CSC Chongqing Dongfeng Shipbuilding Corporation. The system will be delivered to the shipyard in early 2010 and installed on a 368TEU Container ship for USA owner, Tropical Shipping with ship delivery scheduled for early 2011.

The 250m^3/hr Hyde Guardian system was chosen by the shipyard based on its International Maritime Organization (IMO) type approval, compact and modular design, low power demand, and its demonstrated effectiveness and reliability. The system is fully automatic and will be integrated into the ship's ballast control system. The Hyde Guardian system originally received IMO type approval from the UK Maritime & Coastguard Agency (MCA) issued by Lloyds Register in April 2009.

During the IMO MEPC 59 meeting in London in July 2009, it was agreed that there were sufficient type approved technologies currently available to met the current resolution for ships



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constructed in 2010 and therefore no changes was need to Assembly Resolution A.1005(25). It is hoped this will help to speed the ratification and implementation of the Ballast Water Management Convention.

Contact Hyde Marine Inc, 28045 Ranney Parkway, Cleveland, Ohio 44145 USA.
Tel +001 440 871 8000 ext 156
Fax +001 440 871 8104
E-mail: sales@hydemarine.com
www.hydemarine.com

Bridge Equipment

New bridge watch alarm

Uni-Safe Electronics A/S has announced its latest development of its bridge navigational watch alarm system BW-800, that will be available on the market in summer 2009.

The system is designed to ensure the continuous monitoring of the bridge operator's fitness during "one man bridge" operations. The bridge watch alarm is produced in accordance with international and Danish laws for "one man bridge" operation, e.g. International Maritime Organization (IMO) resolution A830. The product is currently being tested for IMO approval.

New regulations from IMO's Maritime Safety Committee (MSC) will require carriage of a Bridge Navigational Watch Alarm System (BNWAS) to comply with IMO performance standards. For existing ships, the equipment should be installed in connection with the first survey after the following deadlines:

- Existing passenger ships and ships over 3000gt: 1 July 2012
- Existing ships over 500gt: 1 July 2013
- Existing ships over 150gt: 1 July 2014
- New ships over 150gt and all new passenger ships constructed after 1 July 2011 shall be equipped with a Bridge Navigational Watch Alarm System.

Contact Uni-Safe Electronics A/S, Amager Strandvej 124, DK-2300 Copenhagen S, Denmark.
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It's the Ergonomy stupid!

The rapid growth in container shipping has not been matched by increased protection for stevedores and crews when working on containers aboard ships. However, the Ergonomic Container Lashing (ECL) initiative by Lloyd's Register aims to develop rules that will enforce minimal design changes to safe guard lives, writes David Tozer, Lloyd's Register's business manager, Container Ships.

Death and serious injuries including musculo-skeletal disorders occur with a frequency that is becoming unacceptable in the marine industries. The extent of the hazard to crews is less well documented, but must be considerable.

Dubai Ports World, among other terminal operators, has recognised this problem and is taking unilateral measures to protect its staff.

According to the International Federation of Transport Workers few terminal operators keep records of accidents, partly because dockers are often sub-sontractors and, therefore, not directly employed, but also because terminal operators around the globe fear for their reputations should such figures be released.

DP World, however, said in a presentation that it believes: "The current rate of fatalities and fatality-potential incidents onboard vessels highlights the need for an urgent focus to aggressively identify and improve the risk controls we have in place."

Trevor Harris, DP World's manager global safety and environment, added: "Historically, unsafe conditions onboard vessels undertaking lashing activities have contributed to a large number of fatal accidents. DP World, in concert with our customers and other interested parties within the maritime and ports industry, has for many years been actively working to identify and manage workplace risks to both port workers and vessel crew members.

"DP World is a member of ICHCA [International Cargo Handling & Co-ordination Association] and is represented on the safety panel that helped to develop the CSS code (regulations that govern safe conditions for the securing of containers), due to be submitted to the International Maritime Organization (IMO) conference in London in September. DP World challenges the traditional safety culture in the port industry, in believing that all accidents are preventable, and that 'zero workplace fatalities' is an attainable goal."

● Compare to Other Industries(2002-2005. KOSHA)

	Item	2002	2003	2004	2005
LTIFR*	Harbor Loading & Unloading	1.31	1.69	1.47	1.49
	Manufacture	1.22	1.42	1.28	1.18
	IT	0.77	0.9	0.85	0.77

*LTIFR: Lost Time Injury Frequency Rate. Injury causes a loss of 4 days or more.
PNC received KOSHA award for LTI Free 640 days (Phase 2)

Item		2002	2003	2004	2005
Harbor Loading & Unloading	Employees	108,858	93,766	90,380	88,534
	Injuries	1.428	1,581	1,329	1,315
	(Fatality)	(49)	(35)	(45)	(35)
	LTIFR	1.31	1.69	1.47	1.49

Accidents statistics - Korean Ports - Source DP World.

● Fatality Type(2001- Apr 2008)

Year	Fall from heights	Drowning	Collision	Crushing	Slip & Trip	Total
2001	1					2
2002	2					7
2003	0					2
20 4	3					9
2005	0					7
2006	1					5
2007	1					4
			0	2	1	6
Total	10		8	9	6	42

● Analysis
- Difficult to get good statistics, high number of subcontractors work in Busan Port. Statistics are scattered to different branches.
The numbers are sobering action needed!

Fatality trend - Busan Ports - Source DP World.

The CSS regulations were considered too complex when reviewed by the IMO last year and Lloyd's Register's initiative, to find a solution for current ships with different regulations for newbuilds, has been developed with the backing of industry from across the board and including ICHCA.

There have been a number of highly publicised cases in recent years where ineffective securing arrangements for deck stowed containers have led to damage and loss of cargo. An often overlooked aspect of marine trade is the need to lash containers quickly and effectively while not jeopardising the safety of the port workers and ship's crew who are required to perform the lashing tasks.

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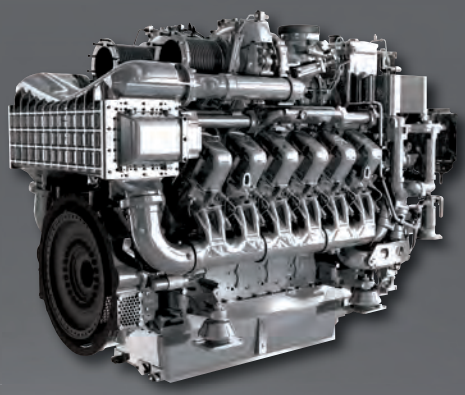

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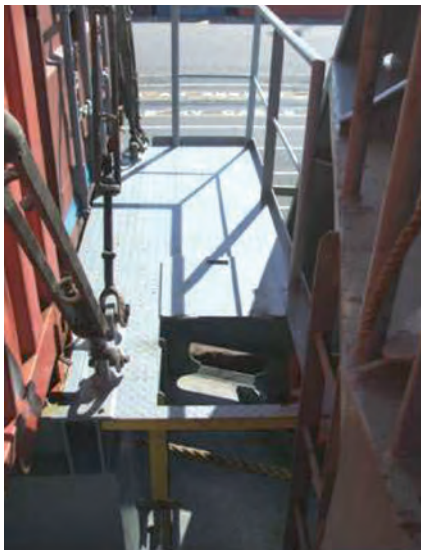

Figure 1. Modified outboard work area with platform at the right height, fencing and consideration of access.

It has been stated that approximately 10% of lost time accidents (LTAs) associated with container operations result in permanent disability.

Historically, there have been some gaps between ship and shore regulations on the topic of ship design for safe container working. A number of initiatives have aimed to improve safety of working with containers, mostly directed at the dockworker rather than the seafarer, including the ongoing work at International Maritime Organization (IMO) led by ICHCA International Ltd and an Ergonomic Container Lashing (ECL) notation by Lloyd's Register.

The port regulatory framework is different to that for ships. A new emphasis on occupational health and safety for ships, including safe access by seafarers to containers, may follow from the adoption of the ILO Maritime Labour Convention and supporting guidance.

The onboard working arrangements in terms of access to containers, movement in and around containers and the securing of containers is an important issue for port workers and the ship's crew. When consideration of these aspects is absent in the design, construction and maintenance of ships, container working can be hazardous. Guidance has been available for a while, there are some national Regulations and IMO has made recommendations on safe design. Major terminal operators are now inspecting ships before deciding whether to work them, and advising Port State Control where necessary.

The principal hazards include;

- Falls from height e.g. outboard stanchions
- Slips, trips and falls on the level
- Minor injuries and musculoskeletal disorders
- Falling objects.

Fully addressing these hazards requires a 'safe system of work' covering design, procedures, training etc. This paper concentrates on the contribution that can be made by ship design.

Figure 2. Retro-fitted work platform to hatch cover end.

Figure 3. Markings.

Consequences

Apart from the direct implications for the casualty, there are many further consequences of an LTA or fatality on other stakeholders associated with the trade. The ship owner, operator, manager, terminal, stevedoring contractor, insurers, P&I, Port State Control – many or all of these may be affected and would incur knock-on costs. The cost is not just financial, an LTA will also have an effect on company image, especially as the general public starts to become more aware of these issues.

The simplest cost to evaluate that of the extra fuel necessary for the ship to make up time to return to schedule – is not insignificant. For example, an 8000TEU container ship delayed in Western Europe will incur a fuel penalty of about US$5000 per hour of delay if she has to increase speed to arrive at Suez on schedule. Discussions with container terminals indicate that a LTA will typically result in a delay of many hours.

Ship Design for Safe Container Lashing

The design of container ships is a challenging, high-tempo activity, where structural strength, ship dynamics, carrying capacity and other factors interact. The sheer scale of intercontinental ships means that many of the design features discussed here are relatively small and hard to inspect on a GA plan. However, good practice does already exist in the industry, including the use of mock-ups to check ease of operation, so we know it can be done. Fortunately, most of the design requirements can be expressed as dimensions, simplifying design and survey, although general requirements are still necessary to allow for exceptional cases.

Work areas

Container securing is performed at four work areas:

- Between stacks
- Lashing bridges
- Outboard positions
- Hatch cover ends.

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A docker works a container ship without fall protection.

The requirements are as follows.

Fall protection: The most significant hazard is falls from height. The level of risk exposure in many current ships is remarkable, and it is surprising that there has been only one formal incident report to the author's knowledge. The most credible explanation for this is the mix of ship and shore regulation. The hazards of container top working have been mitigated by measures taken by the ports, but there are hazards that require mitigation by ship design; frequently some fencing (guard rails) is all that is required.

Avoidance of falling object hazards: To a large extent this is largely an operational matter, but there are aspects that can be improved by design. Twistlocks and stackers that do not fall out from a transiting container, lashing bars that do not fall out of their socket when loosened reduce the risk, and the introduction of overhead protection on lashing bridges provides some mitigation.

Prevention of slips, trips and falls on the level: The hazards here include poor surfaces and trip hazards from parts of the ship's structure and loose fittings.

Adequate space: There should be sufficient space for two people to work effectively i.e. an adequate work platform or area of deck or hatch cover.

Avoidance of excessive stretching: It is possible to place requirements on ship design that would prevent excessive stretching, based on current practice and some fairly straightforward anthropometry. The height of the work area in relation to the stack is an important requirement. The key task requirement is to be able to hold the lashing bar up and present it to the container. This translates to a requirement for the distance between the bottom of the lashing bar and the work platform to be 1600mm or less. The distance between the work area and the stack is important for lashing bridges where it is not possible to stand next to the stack, and the operator has to lean over the rail waving a long heavy lashing bar. Extension pieces on lashing bars may solve a structural problem, but almost inevitably create an operational problem, and cannot be considered part of a satisfactory arrangement from the operator point of view.

In general, the above mean that the design of a work area needs to include the following features:

- An area of deck or a work platform, clear of obstructions
- Safe access to the work area (which may well be on a platform)
- Fall protection
- Lighting
- Stowage facilities for fittings.

Between stacks e.g. on hatch covers

The main need here is to provide enough space to allow effective working. Inadequate space leads to slow and ineffective securing and may lead to some occupational hazards of slips, trips and falls due to cluttered conditions. Fall protection may well be required at the outboard ends of the work area.

The most widely adopted current regulation for this work area is from the Australian Maritime Safety Authority (AMSA), which requires 550mm between containers and recommends 550mm clear space (i.e. between deck cleats) as a work area. Adequate space is required between the deck cleats and the stacks to allow the turnbuckle to be tightened effectively. IMO is proposing a different approach to specifying the work area, but one which requires a similar amount of deck space.

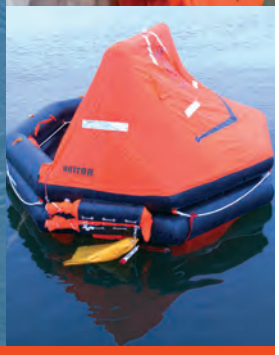
Lashing bridges

Lashing bridges represent a big step forward in terms of working arrangements, but they are not free of hazard; the design of access hatches requires attention to detail to prevent falls.

The area under the lashing bars is out with the lashing bridge, leaving the work platform relatively free for operators. A consensus on the width of the lashing bridge has still to emerge. Lloyd's Register has adopted a 600mm width, based on current good practice.

The operator is unable to stand next to the container 'under' the lashing bar, which increases the need to stretch and hold the lashing bar away from the body. Preventing excessive stretching by the operator requires consideration of the compatibility between the bridge and the proposed stowage, laterally (e.g. 40' containers in a 45' bay) and vertically (e.g. high-cubes). There is general consensus on the degree of stretching that is acceptable. Lloyd's Register has taken the measurement between the hand rail and the stack and set a criterion of 1100mm maximum.

The available space can become constricted by the stowage of lashing bars, which need to be kept out of the way e.g. by hoops (rather than spikes). The geometry of the lashing bridge, fittings, stacks and ship structure can become hard to visualise and there are numerous instances of inoperable



Monitor, maintain and manage safety on board

Safety at sea is the primary aim of every professional ship owner and operator. International focus on marine safety now places even greater emphasis on the need to ensure the continued compliance and certification of onboard lifesaving equipment.

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arrangements caused by flaws in detailed design. Careful evaluation of a proposed newbuild pays dividends. Current good practice, e.g. by MacGregor, includes the use of simple mock ups to prove a design.

Outboard positions

The prevention of falls from outboard positions has to be the highest priority. There is a great deal of very poor design practice, with no attempt to prevent a fatal hazard.

A work platform is required. This may not appear as a consequence of normal ship design and so may need to be added specifically. The current consensus is for an area 750mm deep, with 500mm clear of deck cleats etc.

Access to the platform may need to be provided in addition to normal ship access routes. Fencing is required on the outboard side and where falls are not prevented by structure or containers. Fencing may need to be removable to avoid damage by passing containers. Figure 1 shows a retrofit outboard platform.

Hatch cover ends

As with outboard positions, there is a need to prevent falls from height. Fall protection in the form of fencing is likely to be required. Whether the fencing is permanent or temporary depends on the geometry (e.g. height of coaming, distance from work area to hatch opening). Fall protection may only be required for working when a hatch cover has been removed.

The normal ship design process may not generate a suitable work area, and it may be necessary to add a work platform at the right height and to provide suitable access; Figure 2 shows how a big improvement can be made.

Access And Movement Round The Ship

The means of preventing slips, trips and falls have been documented for a long time, and most shore-based industries are legally required to adopt them. Guidance was produced in the mid-1970s to finally tailor such requirements to ship design, but application was stalled by the oil crisis of that time. Guidance for ship design exists, but slips, trips and falls remain a major hazard on ships and a priority for the IMO Human Element Working Group. It is hoped that the introduction of design requirements to prevent slips, trips and falls for container working can lead on to a more general application.

Walkways

Walkways need sufficient width (600mm) and enough clear height to allow for movement and hard hats (2100mm). They need to be clear of obstructions and openings.

Movement between levels

There is established good practice on the selection and design of ramps, stairs and ladders. Ladders are of particular relevance to container securing and are discussed below.

Ladders

The specification of ladders to provide safe movement and fall protection requires considerable detail and a long list of dimensions. There is a fair consensus on the requirements, albeit with a few differences between ship and shore.

A design aspect clarified in the LR ECL notation is the difference between the length of a ladder and the potential height of a fall; it is possible to have a short ladder with a long drop and no fall protection. Very long ladders need to be split into sections with landings and fall protection. The transition between ladders and decks or work platforms needs detailed design consideration. Coamings and hatchways need to be big enough to get through easily, have hand and foot holds, and provide adequate access.

Fencing

The established requirements for fencing in ship design are from the Load Line Convention. Here, the hazard is being swept off the ship, and so the design requires a low-level rail in addition to an intermediate rail. Any more general requirements for safe movement need to be compatible with the requirements of the Load Line Convention e.g. where the Load Line Convention applies to a walkway, its requirements are met. Where the requirement is for fall prevention only, it is not necessary to meet the requirements of the Convention.

Fencing requirements to prevent falls from height are well established for shore-based industries such as construction. Such requirements have not become fully incorporated into the ship design process, although there are a number of national regulations that have been used as the basis for their adoption. The main requirements converge around a rail 1m high with an intermediate rail at 500mm. Temporary fencing is likely to be required for many ship

Climbing on ship structure to lash containers is a common and hazardous practice.

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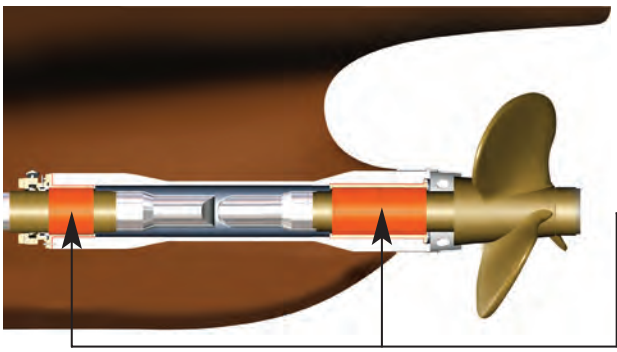

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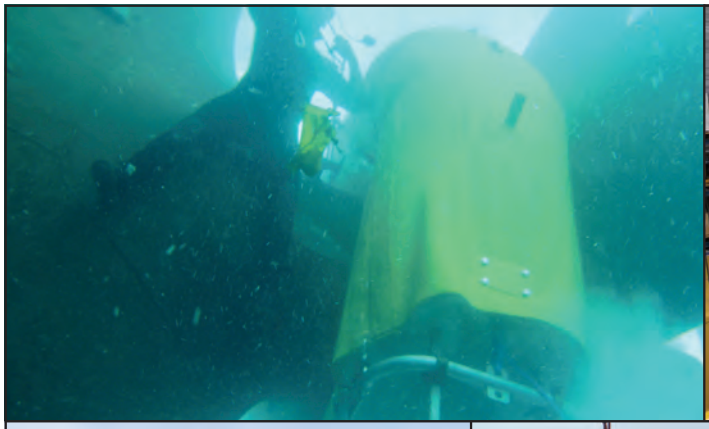



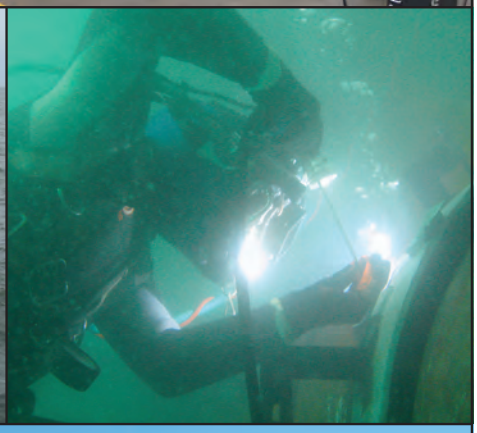
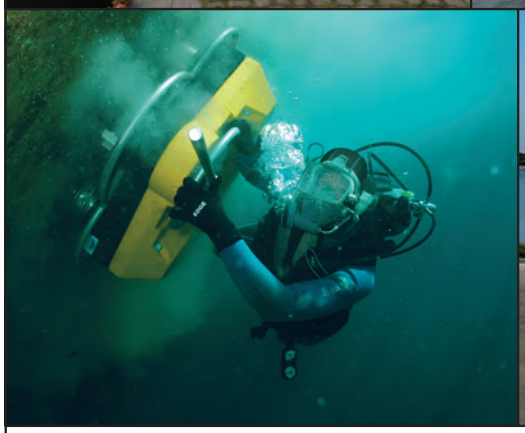


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installations and there is a consensus on the requirements for this (e.g. preventing gaps wider than 300mm). Strength requirements are valuable in assisting the determination of robustness. Toeboards help people keep their footing and prevent falling objects and are more appropriate to the hazards than a low-level rail.

Current practice in fencing design (where implemented) is mixed, and there are numerous instances of T-bar fencing that is almost completely ineffective in fall prevention. There is a maintenance burden associated with fencing, and the need for upkeep or repair can be highlighted during survey or a port inspection.

Coatings, surfaces, signs and labels

It has been said that 'a plain painted deck is an avoidable hazard', and so anti-skid surfaces are required in areas where people walk. Marking out walkways and highlighting potential hazards contribute to reducing accidents. A pot of yellow paint can do a lot of good (see Figure 3).

Port workers arrive on the ship and start work quickly, so notices and signs (beyond the normal hazard warnings) can assist the ship-shore communication.

Portable deck plates and gratings are sometimes part of the arrangements. These need to be present (rather than missing from the ship) and kept in good order.

Lighting

Container securing is conducted at night and lighting is required. Relying on the crane for such lighting may impose undue costs and delays, so the ship needs to provide its own. It can be hard to provide adequate lighting for some work areas. Achieving lighting that is glare-free is difficult as stevedores need to look up e.g. to insert the head of the lashing bar, and to look down to pick up lashing bars. The introduction of overhead lighting on lashing bridges is a big step forward.

There are well-established requirements for light levels and broad consensus on the levels required. However, the marine sector is generally unfamiliar with designing to meet specified light levels and there is a need to transfer design tools and methods from other sectors to make this a simple, low-cost activity. Required levels are typically:

- Access routes – 10 lux
- Working areas – 50 lux
- Where the dangers of tripping or falling are greater than usual – 30 lux
- Area for inspecting and repairing fittings – 540 lux.

Of course, the lighting must not interfere with safe navigation as and when it is used by the crew at sea.

In conclusion

It is possible to design ships with working arrangements that support safe and effective securing. We know this because there are ships that have implemented good practice. For existing ships with design shortfalls, it is frequently possible to make modifications at low cost (though these may bring a maintenance burden).

Good practice is mostly to be found in the intercontinental ships. The design of feeder ships for safe and effective securing is more challenging. There is plenty of scope for innovation in both types of ship, at the radical level and at the level of useful ideas from the crew (for example, UK P&I Club "Useful Ideas").

At the time of writing, work is underway in IMO, and the specific requirements in the proposed Annex to the CSS Code may still change. Similarly, Lloyd's Register's Provisional Rules are still undergoing review. It is the hope that these initiatives, and the initiatives by the terminal operators, can converge on a common cost-effective set of design criteria.

The Ergonomic Container Lashing (ECL) initiative by Lloyd's Register fits entirely with the mission statement to "…enhance the safety of life and property at sea, on land, and in the air…". Lloyd's Register continues to invest in this work, in close collaboration with industry stakeholders from many perspectives, to improve the quality of design and the maintenance of new and existing container ships, for the benefit of owners, operators, builders, designers, and especially the stevedores and crew who work in a difficult environment to help deliver the goods which each of us depends on in our daily lives.

ACKNOWLEDGEMENTS

This article reports work by the team at Lloyd's Register. Assistance and user input by the Port of Felixstowe is very gratefully acknowledged. The paper also discusses work by others, notably the intercessional group of interested parties co-ordinated by ICHCA.

Enquiries should be addressed to Lloyd's Register, 71 Fenchurch Street, London EC3M 4BS, England. The point of contact for the ECL notation is David Tozer david.tozer@lr.org . *NA*

The 2006 *Catalunya Spirit* sloshing shockwave still shaking the LNG industry

LNG shipping experts are forced into a methodology rethink as a battered Teekay vessel shakes LNG cargo containment system presumptions.

Commercial considerations were a factor in Gaztransport & Technigaz's (GTT) desire to officially maintain an absolute silence on the damage to *Catalunya Spirit*, a 2003-built liquefied natural gas (LNG) carrier, which had severe damage to its cargo tanks after only three years service.

That silence was important because in the late 1960s and 70s a number of incidents concerning damage to the membrane containment systems of the then modern LNG carriers, caused by sloshing of the cargo, had been used by a Norwegian competitor, Moss Maritime. The Moss Spherical system manufacturer wanted to show that membrane technology was a failure. Moss spheres do not suffer the same problems as membrane containment systems mainly due to their shape.

Increasing market demand for LNG has, however, driven the development of ships to far greater sizes and with the larger sizes membrane technology has become the preferred containment system of the LNG shipping industry and GTT maintains an effective monopoly on the supply of the membrane containment systems. So when a three-year old LNG carrier was found to have sloshing damage the effect on designers, owners and other LNG industry figures was one of incredulity.

A Q Flex ship going through its paces.

But LNG ship operators are concerned that virtually new vessels can suffer such serious damage that the repairs costs run into millions of dollars when the cost of repair materials, 70 days drydocking or more depending on the extent of the damage, labour and the loss of earnings is combined, according to a source close to GTT.

Sloshing issues are not considered dangerous at the moment. "Any minor breach of the primary barrier would result in gas alarms being triggered and the secondary barrier would hold so there is no danger, but the problem is costly," said a source close to a LNG operator, adding that "there is no warranty and recourse to the manufacturers".

An inside source at GTT explained that the problem for the owner is to gauge "how important these deformations are and we don't know how many ships have these deformations". He went on to ask: "Does the owner accept the deformations and continue to operate the vessel with the damage, will the deformations evolve in time? We don't know."

Up to June this year GTT maintained an unfaltering public silence on *Catalunya Spirit*, the ship in question and forced business partners to sign confidentiality agreements to maintain that silence. Even after a paper was presented at a Japan conference in June, by GTT employees, the company then reverted to its previous silent position and has not responded to questions from this publication on the subject.

Perhaps that silence is unsurprising given the stakes are so high with most LNG newbuildings now using one of three membrane containment systems

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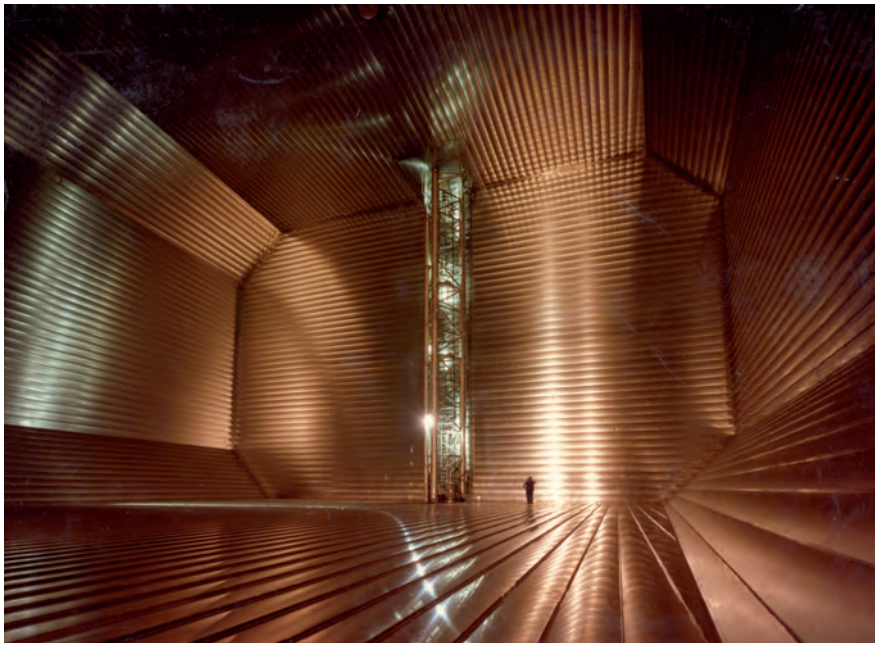

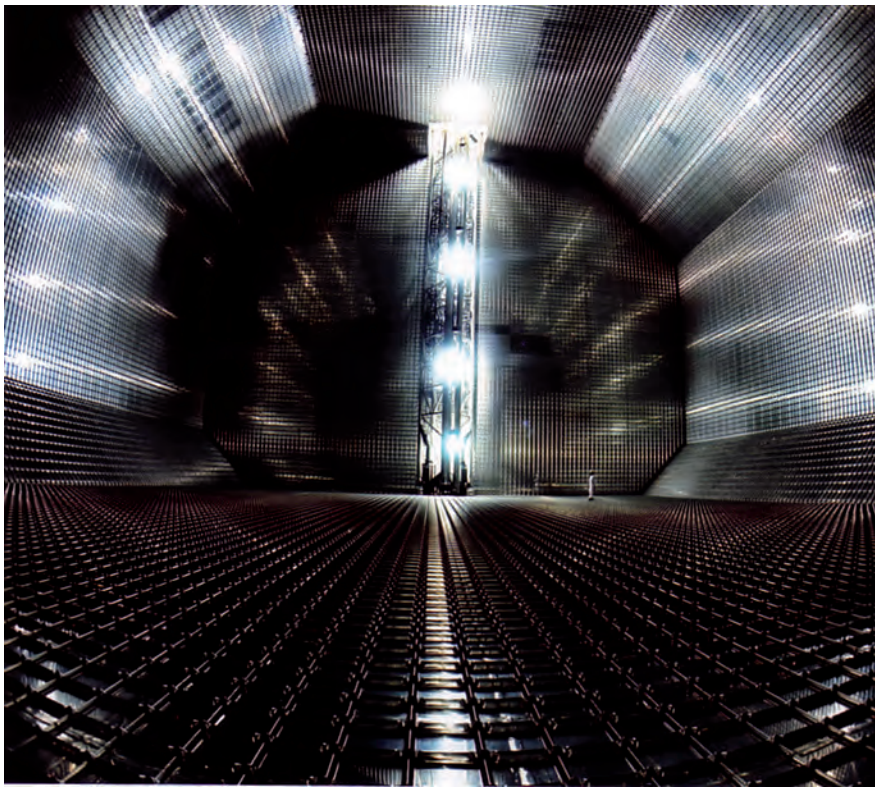

Above a NO96 tank and pump tower and below a MKIII tank showing the corrugations.

manufactured by GTT. Indeed, by 2008 the number of membrane LNG tankers in service was around 200, about twice as many as the Moss sphere tankers, while at the end of 2007 the orderbook stood at around 147 LNG carriers 83% of which had either the MKIII or NO96 membrane containment system.

Membrane technology is popular for the larger QMax that are capable of handling around 260,000m^3 of LNG and QFlex ships with a capacity of 215,000m^3, in particular because their design means that the ships do not suffer the difficulties of the spherical steel tank designs. Essentially, masters working on the bridge of Moss tankers had a restricted view and would suffer from heel in heavy winds.

In addition, and just as significantly, the comparatively low cost of the construction material and operational costs meant that building LNG tankers with membrane containment systems was mutually beneficial to the ship owners and their clients who both benefited.

Developed throughout the late 20th century the MKIII, which has a 1.2mm corrugated steel primary membrane and a 0.6mm Triplex secondary wall and in between the 270mm thick insulation that maintains the cargo's temperature at -163°C is reinforced polyurethane foam.

The NO96 membrane utilises 0.7mm invar, a steel and nickel alloy (36% nickel) for the primary and secondary membranes. Insulation is 530mm thick perlite barrier contained in plywood boxes.

Manufacturing costs for both of these containment systems are, according to GTT training information, the same. And with the evolution of LNG as an alternative energy source to oil the conditions for the development of the LNG industry including LNG shipping are ripe, with GTT currently the only manufacturer offering the world's most popular LNG cargo containment systems. By the end of 2007 there were 72 MkIII membrane tankers on order, 50 NO96 and just 22 Moss carriers ordered.

Past problems were thought to have been solved through a concerted effort by engineers at GTT and the classification societies that had managed to solve the LNG tankers' major difficulty with sloshing damage in the 1970s.

"If not mastered, sloshing was thought to have been understood deeply enough to envision with great confidence the future development of very ambitious projects such as giant floating natural gas liquefaction plants and the whole industry was pleased about the way the this historic and annoying problem had finally been overcome," Thomas Gavory and PE de Seze, both from GTT's marketing department said in a paper delivered at the 19th International Offshore and Polar Engineering Conference in Osaka, Japan, in June.

Mr Gavory has since left the company, but the paper went on to describe GTT's shock and dismay following a routine

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drydocking in 2006 of what was still a very new ship, *Catalunya Spirit*.

During that routine drydocking, in 2006, of the 138,000m^3 Teekay owned and operated vessel a decision was taken to inspect a malfunctioning pump in one of the cargo tanks and to inspect the other tanks. During this inspection it was noticed that there appeared to be some damage to the cargo containment system and a more detailed investigation was instigated.

Closer inspection revealed that the NO96 containment system was indented in a number of locations "in tanks 2, 3 and 4 in a zone just above the upper knuckle of the lower chamfer on both sides of the tanks," explained Mr Gavory and Mr de Seze.

All the indications were that the insulation boxes behind the invar had collapsed. "In some areas the invar tongue immediately above the indents had been bent upwards and the majority of the most indented areas were located right below the invar tongue," Mr Gavory and Mr de Seze explained. They said this indicates the presence of a "local over-pressure" due to the presence of the invar tongue.

This information sent shockwaves through GTT in 2006 that reverberated throughout the industry and they are still being felt today, including the classification societies, and especially Lloyd's Register which had classified the vessel as safe and the flag state, in this case the Spanish flag, that issued the Certificate of Fitness.

Not only did *Catalunya Spirit* put paid to the industry's view that the sloshing issue had been laid to rest, it also called into question the sloshing analysis methodology. In particular the "basic premise that for a given wave period, the greater the ship motions or accelerations, the higher the impact pressures," said Mr Gavory.

He went on to explain that with the pre-*Catalunya Spirit* methodology that was "widely accepted and used at this time, only a wave envelope with the highest sea states over a given return period was studied and was thought to be representative of the worst possible environmental conditions with respect to sloshing loads."

Industry experts were flabbergasted and upon the investigation of the vessel's actual route they showed that in some sea states, with an intermediate wave height the sloshing pressures could be far higher than previously expected and in particular when tanks are low filled.

> "If not mastered, sloshing was thought to have been understood deeply enough to envision with great confidence the future development of very ambitious projects"

Sloshing incidents first came to light in 1969 on a vessel called *Polar Alaska,* which on its first ballast voyage experienced resonance in its first cargo tank which was filled to around 20% of its capacity. During this first ballast voyage strong impacts within the cargo tank were caused when the wave motion of the sea came close to the resonance of the wave motion in the tank. Slight damage to the tank wall resulted in gas infiltration and damage to electrical cable supports were also noted.

Clearly it was important to contain the cargo within the tanks as any contact with the ship structure, with the LNG cooled to -163°C would make the metal instantly brittle, according to an LNG specialist. In *Polar Alaska* incident the primary barrier had been breached, but the secondary barrier held firm. Following this incident owners were advised to divide liquid heel for cooling tanks into all the tanks rather than to keep it in just one. This was thought to have solved the problem.

Around 20 LNG carriers using membrane technology, ranging in size from 40,000m^3 to 130,000m^3 were built in the 1970s there was no other sloshing incident until 1978, nearly 10 years after *Polar Alaska*. Again the ship was in relatively calm waters with a wavelength that was similar to the length of the vessel. This caused resonance within the ship, but since the sea state was not particularly challenging the crew was not prepared for the strong vibrations and muffled noises heard aboard *Larbi Ben*

The 2007 built *Al Ruwais* - the US$220million Q Flex ship was built at the DSME yard, is German owned and operated by Qatagas.

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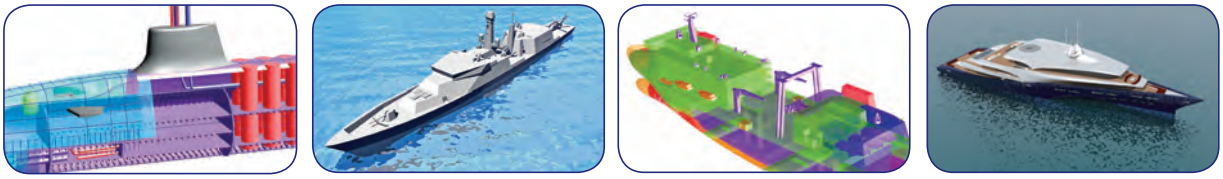

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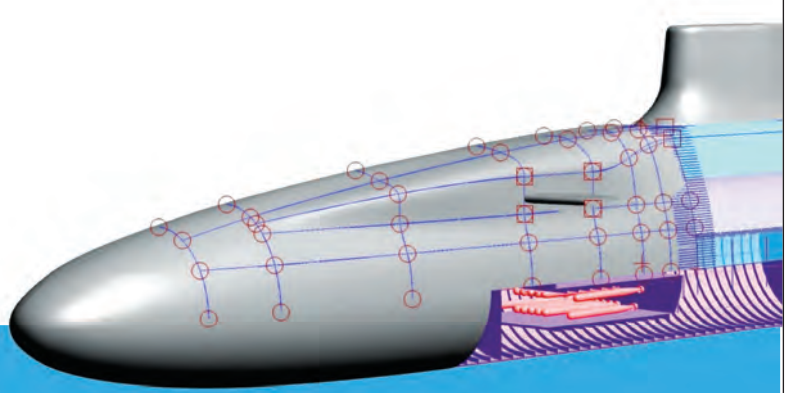

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M'Hidi which operated between Algeria and the USA East Coast.

At the vessel's next scheduled dry docking limited damage was confirmed to the membrane containment system, but there was no loss of tightness to the membrane and no interruption of commercial operations. However, GTT's "competitors launched a negative campaign against the invar type membrane systems", said Mr Gavory and Mr de Seze. This led to Gaz Transport instigating its own studies into the sloshing problems along with aviation company McDonnell Douglas, the Japanese yards Mitsubishi Heavy Industries and Nippon Kokan Group and class society Bureau Veritas, who together formed the Sloshing Club.

At one of the club's first meetings in London a working plan was devised to measure impact pressures in tanks. Results from the clubs tests showed that "impact pressures were much higher than those expected, which could explain the impact heard aboard ships under actual conditions of operation," suggested Mr Gavory and Mr De Seze. In addition the tests revealed that the introduction of large slopes in the upper cargo tanks clipped the waves generated inside the tanks and "reduced the turbulence of the liquid".

So it was not until the 1990s when the industry began to look at offshore LNG units that the sloshing issue again came to the fore. However, by now the previous experience and newly developed computer power that made 3D computational fluid dynamics (CFD) possible meant that the industry was better equipped to meet the sloshing challenges that were anyway thought to have been largely solved. Then out of the left field came *Catalunya Spirit* that challenged all the previous knowledge and threw designers into a panic.

What is more, up to last year all the cargo tank deformations had been observed on NO96 membrane systems, the MKIII system had been spared these sloshing difficulties, designers thought because membrane corrugations would entrap gas and cushion the impact. In 2008 designers and operators were to get another shock as three vessels fitted with the MKIII membrane showed deformations, these did not become cracks to the system and there were no leakages, and again the deformations had been seen while the vessels were undergoing routine drydock inspections.

Built in 2004 *Puteri Zamrud Satu* was built byMitsui Engineering. The 137,000m^3 ship cost US$180million and is owned by MISC of Malaysia and operated by Petronas Tankers.

All three vessels were damaged in different locations within the tanks and in different tanks, but all the deformations occurred in tanks where the liquid height ranged from 3m to 5m. This deformation is thought to have been caused by higher pressures experienced at the corrugations.

> "If your car has a dent you don't like it, initially it's cosmetic but as time progresses it becomes more than cosmetic, it could deteriorate with age"

Effectively the three incidents in the MKIII containment systems show that there is a long way for designers to go in understanding the sloshing problem and that this problem is not merely a cosmetic one. One industry expert, who did not want to be named, suggested: "If your car has a dent you don't like it, initially it's cosmetic but as time progresses it becomes more than cosmetic, it could deteriorate with age. There was no immediate risk after the damage to these vessels, but we didn't expect to see such damage and the risk could come later in the vessels' operational life."

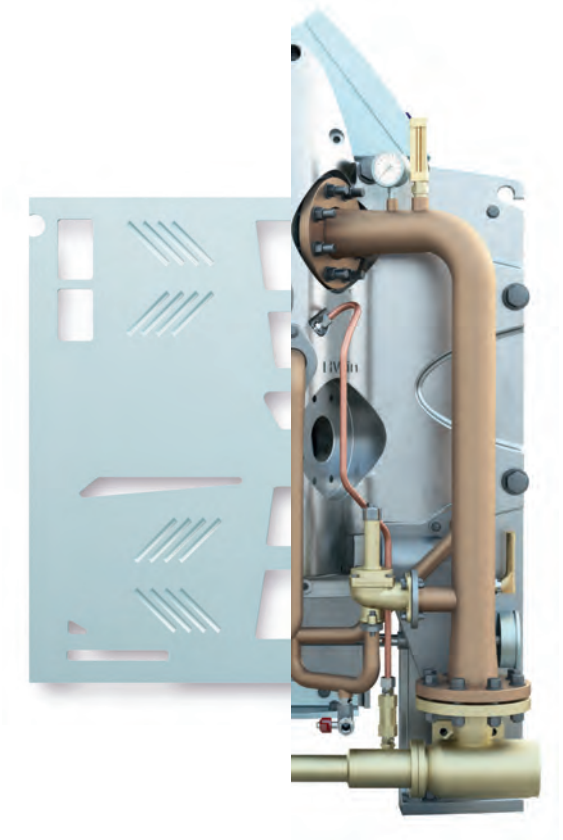
Sean Bond, manager, technology and business development in Europe for ABS, said the company is "working with GTT directly to solve the low fill issues".

According to Mr Bond the industry knows a lot now about the sloshing issue, "a lot of work has been done on sloshing."

That was the view taken by the insider source at GTT also: "I don't think the problem will grow, plywood boxes have been reinforced and so has the insulation, with plywood stiffeners and the MKIII reinforcements underneath or on the corrugations means that both the systems have been significantly improved. The offshore LNG industry is the new challenge," he said.

But the industry has been here before and that feeling that the sloshing issue has not been conquered, may again come back to haunt the industry. *NA*

Freshwater generation – a story of savings



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Home markets are crucial to continued Chinese development says LR

Lloyd's Register sees the global recession and the potential for growth in China as an opportunity for the country to take the lead in shipbuilding and scrapping. Key to the next stage of the country's progress is the development of its domestic demand.

"China has emerged in the first decade of the 21st Century as a maritime superpower." This was the strong message delivered by Lloyd's Register group director of business development John Stansfeld.

He pointed out that China's economic development has been driven predominantly by globalisation, thus its economic strategy centred firstly on industrial exports. The country's shipbuilding industry has reflected this in its order-book: the majority of ships built or on order were contracted by foreign owners.

Can China rely on the purchasing power of its emerging consumer base to keep its factories busy and by implication its demand for raw materials and energy strong?

John Stansfield keeps optimistic about China's future.

"If it can, this will in turn fuel the demand for more ships for the domestic fleet and help strengthen the emerging marine supply chain. All this has the potential to help China move towards becoming a world leader in quality as well as quantity."

For a ship's full life, construction, operation, repair and recycle complete the entire circle. Mr Stansfeld, questioned whether there is a sustainable maritime industry in China that completes this circle in addition to the dramatic jump in newbuilding activity.

The answer is, of course, "Yes" said Mr Stansfeld because China is also capable of repairing and converting ships properly, with COSCO Shipyards, China Shipping Industry, Shanhaiguan, Huarun Dadong and CSSC Chengxi, etc. as world famous players. In 2008, China repaired about 5310 ships totalling about 100million dwt, including 81.8million

China's green approval

China also has the world's most environmentally friendly recycling yards. One of the creators of International Ship Recycling Association, Tom Peter Blankestijn, formerly of P&O Nedlloyd and now Maersk Ship Management, said Maersk comes to China for scrapping and has dismantled some 30 vessels in China.

As one of the world's biggest ship owners, Maersk has been using China Changjiang Ship Recycling Yard based in Jiangyin of Jiangsu Province as the platform to fulfil its social corporate responsibility and serve as a model for the shipping industry.

China, in terms of green dismantling, has been recycling at the wharf or in the dock since 1998 and now all China's ship recycling yards use docks and adopt modern management with advanced equipment. In 2005, China officially implemented the "Universal Standards on Green Ship Recycling". In the first five years of this new century, China invested RMB3.2billion (US$468.17million) in environmental protection facilities and approaches in ship recycling yards.

Changjiang Ship Recycling Yard, for example, has won ISO 14001 and OHSMS 18001 certification and can recycle one million dwt ships annually. In the Pearl River Delta, there are modern demolition yards such as Xinhui Shuangshui that have developed sound ship recycling systems.

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China has already built 15.87million dwt of newbuildings this year.

dwt of foreign ships.

In 2003, China had only 50 shipyards that had the capacity to build vessels greater than 5000 gross tonnes. In 2009, the number of such shipyards has jumped to over 200. China's annual shipbuilding capacity has been growing to 66million dwt, eight times that of China in 2003 and also six million dwt more than the global total in 2003. China's fleet has grown from 16million dwt in early 1980s, ranking the world's 40th to more than 120million dwt, with COSCO and China Shipping ranking among the world's top 10 shipping groups.

According to the China Association of the National Shipbuilding Industry (CANSI) statistics, Chinese shipbuilders have built newbuildings totalling 15.87million dwt in the first half of this year, up 60% year-on-year, including 3.71million dwt in June alone. Meanwhile, newbuilding order intakes stood at 5.88million dwt in the first half, down 81% year-on-year, and cancelled newbuilding orders at Chinese shipbuilders amounted to 69 ships of 3.54million dwt, accounting for 1.8% of the entire orderbook. New orders in June came to 4.7million dwt, five times those during the first five months of this year.

Obviously, in terms of capacity, output and orderbook, China can be called a superpower and the construction technology has achieved significant progress as well because China has proved to be able to build more high-tech vessels.

The question is whether the growth potential in the domestic fleet is sufficient to sustain viable output levels during this unprecedented downturn and support the development of new maritime capabilities. The other question is whether China will cover all elements of the ship's life, from cradle to grave.

Mr Stansfeld also suggested that "China currently has a real opportunity to develop the world's first fully sustainable shipbuilding industry within the borders of a single country. Because as well as shipbuilding and ship repair China also has an opportunity to show the world how to recycle responsibly, on an equally large scale."

He pointed out that China could fill the gap of the shortage of scrapping facilities capable of meeting the standards of the International Maritime Organization (IMO) Ship Recycling Convention.

"The potential realignment of China's tertiary shipyards to recycling increasingly looks a lucrative option, with many already in possession of the concrete facilities in locations suitable for the trade," he concluded. *NA*

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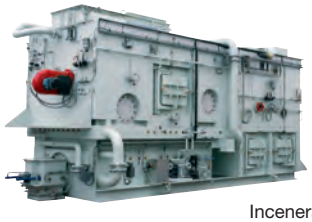

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COSCO Shipyards China's unique integrator

Forging ahead with new graduate appointments COSCO yards are defying the financial crisis and maritime recession to build on its already formidable reputation, bringing praise from the China's ministry.

On 1 August, Zhang Xiangmu, director of the equipment division of the Ministry of Industry and Information Technology, China's watchdog of the shipbuilding industry, gave high compliments to the unconventionally ambitious development and strategic transformation of COSCO Shipyard Group (CSGC) on his visit to the group.

He expressed his expectation that CSGC will grasp the opportunity of the recently launched national plan for the adjustment and revitalisation of shipbuilding and grow bigger and stronger so as to make a greater contribution to China's equipment industry.

CSGC affiliated the State-enterprise shipowner COSCO - China's largest and one of the world's leading shipping companies is the one and only group that has integrated ship repair, conversion, newbuilding and offshore marine engineering into one entity, with its presence extended along China's entire coast.

The dock capacity totals 2.52million dwt, including two 300,000dwt docks, four 150,000-200,000dwt docks, six 40,000-80,000dwt docks, two slipways and four launching skidways, etc. CSGC has a staff of 15,000 and about 45,000 subcontracted workers.

Looking at the coast of China on the map, one will find branches of CSGC starting from Dalian up in the north, Lianyungang and Nantong southward, Shanghai in the middle, Zhoushan further south and then as far as Guangzhou in the far south. Looking around at the sad stories emerging nationally and globally, one is amazed to think that against the backdrop of this devastating crisis, CSGC has newly recruited 1126 graduates from 19 universities rather than laying workers off. In 2008, CSGC recruited more than 600 graduates.

Captain Wei Jiafu, COSCO President, welcomed the new staff to CSGC by delivering an enthusiastic speech, stating that COSCO is committed to no layoffs and no pay cuts so as to share the burden of the country's economic balance and also stabilise society. Yet, he urged all newcomers to be prepared for hardships because there is no easy work in shipyards and also to shoulder the responsibility of boosting China's shipbuilding and offshore industry. Wang Xingru, general manager of CSGC gave the first training class to these new staff.

Evolution Process

Originally founded in June 2001 to do ship repair, CSGC which has become China's largest ship repairer celebrated its 8th birthday on 22 June 2009. In 2007, CSGC's sales revenue reached RMB10.58billion (US$1.5billion) while in 2008, the sales revenue rose by 33%. In the first half of 2009, CSGC's sales revenue was RMB613.5million (US$89.8million).

Besides conventional ship repair, conversion is gaining an increased share of its work and is creating more profits for CSGC. Take COSCO Shipyard Dalian as an example. On 30 April, the shipyard signed a contract priced about RMB100million (US$14.6million) to convert a 300,000dwt VLCC into an FPSO for Japanese owner MODEC. This is the fifth conversion project MODEC has put into CSGC's hands since March 2007 and will be delivered on 15 May 2010. *Bateau* the fourth project which is being converted from a floating storage and offloading vessel into an FPSO is likely to be delivered in the fourth quarter of this year. MODEC and the shipyard have signed a long-term framework agreement to trust all its conversion projects to Dalian in the future.

On 1 July, COSCO Dalian Shipyard delivered the VLCC-to-VLOC conversion project *MG Shipping* to NYK, the second conversion project of the same type to the same Japanese owner. The shipyard has two more VLCC-to-VLOC projects and one single hull-to-double hull VLCC conversion project underway now.

In terms of newbuilding, COSCO Dalian Shipyard launched the first 57,000dwt bulker for EF Shipping on 12 June. The first of the eight 92,500dwt bulkers the shipyard is building for Dutch owner Vroon Dry Cargo finished assembly of the main hull on 25 July. The shipyard aims to deliver seven ships in 2009.

Of course, Dalian is not the only star of CSGC. On 22 June, COSCO Shipyard Zhoushan launched the first 5000PCTC for Guangzhou Ocean Shipping. It was China's first independently designed car carrier so as to implement the national strategy for domestic fleet to ship domestic vehicles.

Since 2006, the ship repair business has begun to boom, and this has attracted the participation of a crazy investment influx in China. It was at that time that CSGC decided to adopt a strategy to highlight both repair and newbuilding to get prepared early for market fluctuation, according to Mr Wang.

CSGC is focusing on the implementation of a Contemporary Integrated Manufacturing System (CIMS) in its three shipbuilding yards, i.e., Guangdong yard, Dalian yard and Zhoushan yard.

To fulfil the strategic transformation, CSCG has been forging its modern management mode of shipbuilding and offshore engineering by learning from the successful experience of South Korea and Singapore. CSGC has also implemented an ERP system with an investment of RMB70million (US$10.2million) to enhance its management over safety, quality, procurement, storage and distribution.

"When the ship repairing scale and technology achieves a certain level, the enterprise will naturally shift to newbuilding so as to better adapt to the market competition," explained Captain Wei. "Since the first day of its founding, COSCO has been offering unswerving support to the growth of CSGC. I firmly believe that CSGC will develop into the world's leading enterprise in both newbuilding and the repair of merchant ships and offshore products."

Now the return on net assets of CSGC is between 50-100%. The sales revenue of CSGC accounts for about 10% of COSCO while its

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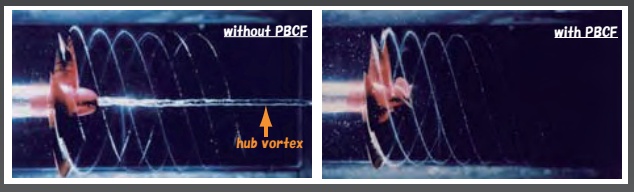

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profits account for 20%. "With the furthering of the strategic transformation, offshore manufacturing will become a new highlight of CSGC," said Mr Wang Xingru.

Offshore Arena

In July 2008, COSCO Shipyard Zhoushan delivered the first offshore product, a 350,000 barrels of oil FSO to Japanese owner MODEC. In December 2008, COSCO Dalian Shipyard completed the world's first FPDSO to Norwegian owner MPF.

As for COSCO Nantong Shipyard, its offshore achievements are more eye-catching through delivering one 350person accommodation and work barge to Belgian owner Estrela on 2 April and completing the construction of *Solution* - the world's first self-navigating and elevating support vessel for Remedial Offshore on 27 May. On 28 June in particular, the shipyard named *Sevan Driller* valued at US$600million a project for Norwegian owner Sevan Marine.

The rig has a capacity for the drilling of wells up to 40,000ft deep while in water depths of up to 12,500ft, a variable deckload of more than 15,000tonnes and high storage capacity of bulk materials. It will be equipped with an internal storage capacity of up to 150,000 barrels of oil. The *Sevan Driller* will work for Petrobras in the Santos Basin off the Brazilian coastline.

COSCO Shipyard Nantong is independently responsible for the detailed design, production design, construction, installation and commission of this rig. The design and construction of the rig only took 24 months, six months less than the internationally common timetable.

The completion of *Sevan Driller* also marks the establishment of the offshore base of CSGC in Qidong, Jiangsu Province, which has entered the production period. The base, with an area of 1000 hectares, will complete its full construction in 2012 when it will be capable of delivering six offshore units and six offshore vessels annually.

Arne Smedal, chairman of Sevan Marine, was very impressed by the efficiency and professionalism of CSGC. He said what he saw in Qidong a year ago were just sand, mud and raw materials for the construction of the wharf, but now what he saw was the completed *Sevan Driller* and all the adequate facilities. He said Sevan Marine will continue to place offshore orders here.

"With COSCO Shipyard Group as the representative, China has entered a new level in terms of offshore manufacturing innovation. The rig project COSCO Shipyard Nantong has completed is a new breakthrough and is a milestone in China's history of equipment manufacturing," said Zhu Hongren, chief engineer of the Ministry of Industry and Information Technology.

By the end of 2008, CSGC had secured in hand US$1.27billion offshore orders. Now CSGC has seven projects under construction, covering almost all types from shallow seas to deep seas.

Selective Staff and Professional Partners

CSGC fully understands the significance of making the best of internal and external human resources as it strives to minimise its gap with internationally advanced shipyards. CSGC has been building up its intelligence bank by recruiting from worldwide sources since the day it set up the goal of being a global market leader. Now CSGC has founded the offshore design centre with Singaporean experts as the backbone and the ship design centre with Korean experts as the backbone. In total, CSGC has a R&D team with more than 1300 staff, including nine senior engineers, five Ph.Ds and 40 experts from overseas.

On 10 July 2008, the COSCO-KOMAC (CK) design Centre, a joint venture of CSGC and Korea Maritime Consultants Co., Ltd. was put into official operation. CK general manager Kim Young Chul said they would make CK the first-class ship design house in the world. CK has already carried out detailed design of a 59,000dwt shuttle tanker and basic design of a 3300TEU containership, 4900TEU containership, 7400TEU containership, 750,000dwt oil tanker, 113,000dwt oil tanker and 50,000dwt open-hatch bulker in sequence.

CSGC has joined Dalian Maritime University in the operation of Dalian Haida Ship Navigation National Engineering Research Centre Co., Ltd., China's only national engineering research centre engaged in R&D and industrialisation of ship navigation systems.

CSGC has also achieved strategic partnership with DNV. On 3 July, CSGC and GL signed the agreement on joint design of a JIP tanker series. On 23 June 2009, CSGC and China Classification Society (CCS) signed the strategic cooperation agreement in Beijing, with Captain Wei and Li Kejun, CCS president present at the ceremony.

RISK Counter measures

Despite the fact that the quoted price of CSGC is usually 10-15% higher than its domestic peers, foreign owners are increasingly turning to CSGC due to its management and efficiency. The year 2009 has been named 'Risk Countering Year' by CSGC, which matches very well with the theme of the world. As Mr Wang stressed, CSGC has to counter against marketing legal risks, financial risks, safety risks, and quality risks in particular.

As for marketing, both the repair and conversion sectors have to be enhanced while close communications with owners of newbuildings are required so as to properly solve their requests for contract modification. Project managers will be offered more legal training while experts will be organised to comb each and every potential risk in all construction projects so as to effectively prevent possible adverse actions from owners and avoid ships from being rejected by owners.

In January 2009, CSGC and China Export & Credit Insurance Corporation Liaoning Branch signed an agreement on full strategic cooperation. The insurance company also plans to offer buyer's credit insurance to offer financing support to owners, which will also reduce the operational risks to CSGC.

Accidents are not rare in Chinese yards, especially in June this year, with crane crashes, ship collisions and gas explosions all having claimed several lives. However, in CSGC accidents are rare because the group has a complete safety management system, with standard operation and administration rules. The project 'Open-and-Shut' is a 130-page pocket book on safety instructions that can be easily carried, understood and implemented by workers, protecting them from being injured in particular.

CSGC will further implement the strategic transformation by highlighting both repair and newbuilding. To achieve its goal, CSGC is planning to apply for more investment from COSCO, introduce strategic investors or finance from the capital market so as to improve the capital structure and optimise the ownership structure, said Mr Wang on 18 July 2009 when summarising CSGC's performance in the first half of the year. ***NA***

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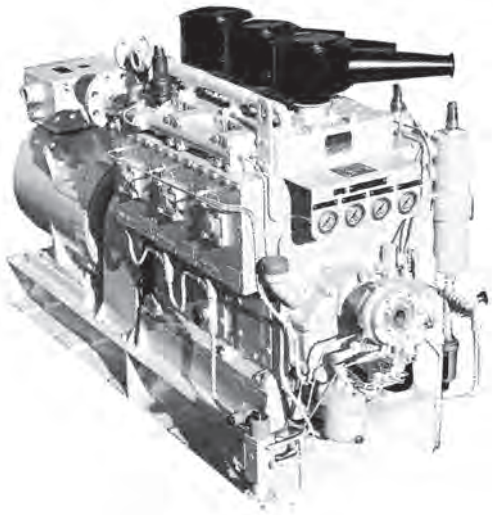

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Rongsheng - the third pole in China's shipbuilding industry

In developing its orderbook Rongsheng has become China's second biggest shipbuilder putting it on a par with China State Shipbuilding Corporation (CSSC) and China Shipbuilding Industry Corporation (CISC) but, still not content with its progress is planning further development.

As the maritime industry bemoans the difficult economic situation in the maritime industry, Rongsheng Heavy Industries (RSHI) – a private Chinese shipyard a mere four years old – trumpeted the world's biggest order in months for four 400,000dwt VLOCs.

The Shangri-la Hotel day-time ceremony in Shanghai on 10 July 2009 was a different image from that which the low-profile RSHI and its president and CEO Chen Qiang had been maintaining before and the ceremony consumed most of the prime work time, and the hundreds of guests and photographers from Shanghai and Jiangsu even had to fight just to get a better position at the time when the contract was signed.

Leading officials from the China Association of National Shipbuilding Industry, the Ministry of Industry and Information Technology, Jiangsu Province and Nantong were all in attendance, giving a strong signal of encouragement to crestfallen players to have some confidence.

The four VLOCs RSHI is going to build for Oman Shipping Company (OSC) are of the same design as the 12 VLOCs that Vale do Rio Doce (known by the shorthand name of Vale) placed on 3 August 2008, each being 360m long, 65m wide and 30.4m deep, with Shanghai Merchant Ship Design and Research Institute (SDARI) as the design house.

Among the four, two will be built to DNV class and two will be built to ABS class. The delivery will take place from the end of 2011 to 2012. These vessels will subsequently be leased to Vale by the Omani side for ore carrying.

"This special occasion not only signifies

Rongsheng has orders to carry yard into 2012.

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a new era in terms of diversifying Oman Shipping Company's fleet, but marks yet another successful chapter in strengthening the relationship between the Government of the Sultanate of Oman and the Republic of China and more specifically the relationship between OSC and Rongsheng," said Mr H.E. Ahmed Macki who is a member of Oman's royal family, minister of economic affairs and OSC chairman. He added that OSC definitely welcomes Rongsheng to participate in its future fleet expansion.

With an investment of about RMB12billion (US$1.7billion), RSHI has built three large docks and is currently building the fourth one which it claims to be the world's widest with the dimensions of 139.5m by 580m. RSHI has put in place three 900tonne gantry cranes while one 1600tonne gantry crane is under construction. Together with the eight outfitting quays and two quays for material transport, Rongsheng now has an annual shipbuilding capacity of eight million dwt which can generate a US$10billion business turnover. Registered in April 2004, the registered capital of Rongsheng has now been increased to RMB2.05billion (US$3.6billion).

In terms of its orderbook, Rongsheng now ranks as the second largest shipbuilder in China and the sixth largest in the world, which makes people refer to it as the third pole in China's shipbuilding arena, along with China State Shipbuilding Corporation and China Shipbuilding Industry Corporation.

The company, with a much greater ambition, has worked out three "Five-year" strategic development plans through 2020 when Rongsheng is expected to become one of the world's top three shipbuilders. To fulfill its great ambition, it has constituted specific tactics of competing for speed and products before 2010 and for technology and R&D after 2010.

With an investment of about RMB200million (US$29.2million), the company has set up a R&D team of 400 people which it will increase to 1500 in the coming few years. Rongsheng has also established a ship design institute and a technical centre, both of which are registered at the provincial level now and waiting for the approval to be upgraded to national level.

The company is also China's only private shipyard that has established a post-doctoral mobile research station and an academic work station. Rongsheng has developed a strategic partnership with China's three leading universities including Shanghai Jiaotong University, Harbin University of Engineering and Jiangsu University of Science and Technology. These three universities have set up their bases in the shipyard for scientific research and training and also to join their efforts with the shipyard on research and development.

China's universities join forces with Rongsheng in research and training.

In 2008, Rongsheng delivered five ships. For 2009, it is aiming to deliver 30 ships of four million dwt, generating RMB20billion (US$2.9billion) revenue and paying RMB500million (US$73.1million) in tax. In the first half of this year, Rongsheng delivered four ships totaling 540,000dwt according to Jiangsu Provincial Economic and Trade Commission.

Despite the comparatively quiet levels of delivery, the work load of RSHI has been scheduled until 2012, with its orderbook composed of four main ship types: bulk carriers, oil tankers, containerships, and offshore. Specifically, there are 75,500dwt ice-class bulkers, 176,000dwt Capesize bulkers, 400,000dwt VLOC, 156,000dwt Suezmax tankers, 6500TEU containerships, a 3000m deep-water pipelayer, and Chunxiao oilfield drilling modules, etc.

To date, RSHI has developed 320,000dwt VLCC, Aframax tankers, FPSO, FSO, etc. as it expands its business scope to cover more value-added products such as LNG carriers and offshore. According to Chen Qiang, offshore is expected to contribute 40% of Rongsheng's business turnover in the near future. In addition newbuilding, repair is also on Rongsheng's agenda.

The development speed of Rongsheng is impressive by any measure when recalling that the shipyard laid down the first steel stake on the small island of Changqingsha in Rugao, Jiangsu, by the banks of the Yangtse River on 28 October 2005. On 8 February 2006, four months after the shipyard started construction, Golden Ocean placed the first order of six 75,500dwt ice-class bulkers.

On 7 October 2007, this private shipyard attracted about US$300million investment from three internationally renowned funds, DE Shaw, Goldman Sachs and New Horizon. On 28 February 2008, RHSI delivered the first ship (H1008) two months ahead of schedule.

Mr Chen has taken the lead in creating the legend of Rongsheng. He is a Ph.D, EMBA, winner of governmental allowances and also visiting professor and Ph.D tutor in the three partnering universities of Rongsheng. When he was 33, he was promoted to vice general manager of Jiangnan Shipbuilding Group. At the age of 36, he was authorised to build Shanghai Waigaoqiao Shipyard, which delivered its first ship three and a half years later. In the past, it would have taken 10 years to build such a shipyard and deliver the first ship. Rumours said Chen left Waigaoqiao because of some conflicts with top management at CSSC, the parent of both Jiangnan and Waigaoqiao.

"The financial crisis has huge impacts upon the shipbuilding industry. Rongsheng

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has been keeping in close communication with owners and has also adjusted some of the orders for the benefits of both parties. We hope to get through this difficult time by joining hands with owners," said Mr Chen.

Mr Chen said the adjustment and revitalisation plan China issued for the shipbuilding industry will aid Rongsheng in developing ship types of high added value. Encouraged by the plan, Bank of China Nantong Branch offered Rongsheng an integrated credit loan of RMB11.25billion (US$1.64billion) on 1 June 2009. So far, RSHI has secured more than RMB21.2billion (US$1.7billion) in loans from the Bank of China. China Export and Import Bank is another strategic partner in the banking sector, one which agreed to offer RMB25billion (US$3.6billion) loan support in March this year.

Rongsheng ready to get to work.

As the market shows signs of recovery, Rongsheng's Initial Public Offering (IPO) plan which was postponed due to the financial crisis has once again become a focus of attention. "A listed company can be most internationalised and standardised, which will change the negative impression of the public upon private enterprises and improve the image and brand of Rongsheng," said Mr Chen. "We have chosen Hong Kong to go for a listing and we have employed PWC to do regular checks so that we can be ready. We are now waiting for the right time." *NA*


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SWS a market leader of both newbuilding and offshore

Shanghai Waigaoqiao Shipbuilding Co., Ltd (SWS), the CSSC subsidiary is 10-years old. As the yard moves into its second phase of development it is taking on more challenging contracts while making its yards a safer place to work.

Orderbook is surely a key criterion to judge a shipyard. However, the track record should be a more important indictor of the shipyard's real capability. In the first half of 2009, Shanghai Waigaoqiao Shipbuilding Co., Ltd. (SWS) delivered 3.0459million dwt ships, becoming China's first shipyard that could complete construction of over three million dwt in half a year.

Additionally, in July SWS delivered two 177,000dwt bulkers (H1095 on 23 July and H1097 on 17 July). The deliveries also include those from Shanghai Jiangnan-Changxing Shipbuilding Co., Ltd. which is also known as the No.1 Production Line on Changxing Island because SWS controls 65% of its shares.

SWS is a 10-year-old but fast-growing subsidiary of China State Shipbuilding Corporation (CSSC). It paid for its development by receiving 175,000dwt bulker orders at a cheap price at the initial stage as it needed to accumulate experience.

The shipyard was put into production in 2003 but quickly accelerated its production to top speed. In 2005, SWS became China's first shipyard with an output of more than two million dwt and also won itself the title as the "world's Capesize bulker building centre". In 2008, SWS delivered 29 ships with 4.66million dwt and the net profit of the company reached RMB2.47billion (US$3.6billion), contributing 59% of its parent CSSC's total profit of RMB4.16billion (US$6billion).

SWS launches and delivers three vessels every 40 days, making it the most efficient shipyard in China. For 2009, SWS aims to deliver 26 ships totalling four million dwt but predicts a decrease of net profit. So far this year, SWS has not yet received any new orders and has seen no orders cancelled.

In addition to shipbuilding, offshore has become a focus for the yard which is said to be one of China's strongest players in this sector. SWS delivered *Hai Yang Shi You 111* – the one million-barrel FPSO in July 2003 and *Hai Yang Shi You 113* – the 1.2million-barrel FPSO in July 2004. In 2007, SWS also delivered the hull of *Hai Yang Shi You 117* – the two million-barrel FPSO, although the superstructure was done by a Singaporean company.

Again for China National Offshore Oil Corporation (CNOOC) China's largest offshore oil supplier, SWS is building a semisubmersible drilling unit called *Hai Yang Shi You 981* which was dry docked on 20 April 2009. The project, priced at about RMB6billion (US$8.7billion), is a sixth-generation drilling platform which can work at a depth of 3000m and drill oil wells of 10,000m. The 30,670tonne unit has a deck which is 114m long and 79m wide. The height from the bottom to the top is 130m. The cables are 650km long. The accommodation area is capable of hosting 160 people and the design life expectancy is 30 years.

"We have been cooperating closely with MARIC on the design of this unit," said Laura Jiang, Deputy Director of SWS' offshore department. She mentioned that just to facilitate the implementation of this project SWS has constructed an office building for all involved parties stationed at the shipyard.

Based in Waigaoqiao, Pudong, in Shanghai, SWS has two drydocks at its headquarters (one 480m by 106m and equipped with two 600tonne gantry cranes, one 540m by 76m equipped with one 600tonne gantry crane and one 800tonne gantry crane) and a quay length of 1500m.

On Changxing Island, it has two drydocks (one 520m by 76m equipped with two 600tonne gantry cranes and one 519m by 106m equipped with two 600tonne gantry cranes) and a quay length of 1322m.

At Lingang Industrial Zone in Pudong, SWS is constructing an offshore and marine equipment manufacturing base, which covers a land area of one million m^2, a quay length of 1000m and a slipway with 300tonne/m payload.

Founded in April 2008, Shanghai Lingang Offshore & Marine Co., Ltd. is fully owned by SWS and aims to invest RMB3.25billion (US$14.7billion) in the first phase which is expected to process 290,000tonnes of steel annually. The second phase is expected to process 400,000-500,000tonnes of steel annually, generating RMB10-15billion (US$1.4-2.1billion) business revenue accordingly.

In 2010, Lingang yard will be capable of producing 2300 blocks, large components and structures for two offshore rigs and more than 30 superstructures. In 2015, Lingang yard will be capable of producing large components and structures for four offshore rigs and more than 50 superstructures.

"Offshore projects are more challenging and really improve the overall management level of the company because they are more knowledge-based and have much higher requirements toward human resources," said SWS vice-president Wang Qi.

Sharing SWS's experience, Mr Qi said that to ensure the success of each project, an outstanding project manager, the right technology, full participation and cooperation of the client, close coordination of team members, smooth communication among partners and support from superiors are all important elements.

SWS has a complete HSE management system which has decreased the accident frequency per million work hours from 1.85 in 2006 when SWS delivered 14 ships, to 1.18 when it delivered 18 ships in 2006, 0.85 when it delivered 21 ships in 2007 and 0.64 when delivering 29 ships in 2008. *NA*

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Longxue - South China's dragon's den set to build on its reputation

In China's north/south divide the former has, to date, been the key shipbuilding region. Longxue is set to challenge the status quo through its expansion and development of its expertise.

It is because a dragon is a noble and glorious icon for the Chinese people that its den must, therefore, be a very mysterious place. Longxue, which literally means 'dragon's den' in Chinese, is just such a place and CSSC Guangzhou Longxue Shipbuilding Co., Ltd. , the joint venture between China State Shipping Corporation (CSSC) (60% stake), Baosteel (30% stake) and China Shipping (10% stake) with a registered capital of RMB2.72billion (US$5.9million), are developing it into the largest shipbuilding base in the Pearl River Delta (PRD).

At Longxue on the morning of 19 June 2009, *Xin Pu Yang* the 308,000dwt VLCC that Longxue built for China Shipping was launched, ending the history that South China had of not being able to build ships above 100,000dwt. The ship jointly designed by the company and MARIC, is 333m long, 60m wide and 29.8m deep.

Its service speed is 15.7knots and it has a double-hull and meets common structural rules (CSR) requirements. With a helicopter apron on the deck, the ship will be used to carry crude oil with flash point under 60°C. The contract was signed on 28 October 2006, while the ship's construction was started on 28 March 2008. It is expected to be delivered in December this year.

Located on Longxue Island, Nansha, in Guangdong Province, the shipyard, covering a land area of 253hectares with a quay length of 4000m, has constructed two large dry docks and put up three 600tonne gantry cranes as the first phase of development of the base. No.1 dock is 490m by 106m by 13m and No.2 dock is 480m by 92m by 13m. The two large docks are aiming to build VLCC, VLOC and even LNG carriers. The 1650m long outfitting wharf is also ready and the first phase is expected to cost an investment of RMB6.6billion (US$9.5billion) and generate revenue of RMB11.9billion (US$1.74billion) annually when it is fully put into production.

By November 2008, Longxue was reported to have received orders for 18 ships, including four VLCCs for China Shipping, eight VLOCs for China Shipping and four VLOCs for Ocean Longevity, and two 82,000 dwt bulkers for Danish owner Norden. The two Norden ships are expected to be delivered from October 2010 to March 2011. The orderbook totaling 4.16million dwt has not yet been expanded in the new year because of the global economic downturn.

According to Xu Guoqing, chairman of CSSC Guangzhou Longxue Ship Building Co., Ltd., the most urgent task for the company is to ensure the smooth construction of the ships on the orderbook and the infrastructure of this base will continue just as planned.

"We have felt the coldness of the global crisis, but we are not in fear. Just like Premier Wen said on his visit to Longxue 'it is winter time though, we have to always bear the hope for a spring," said Mr Xu.

It is, though, bad timing for this slow moving shipyard, as the market positioning

Longxue sets the challenge to the future of chinese shipping.

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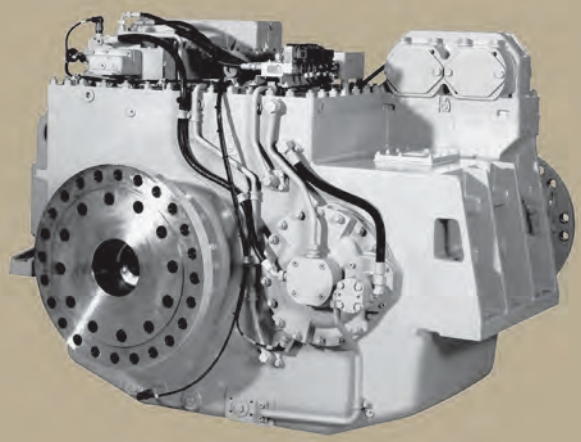

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Longxue gears up for the business ahead.

and government support help leverages the risks Longxue is facing. The fact that China is the world's largest iron ore importer, the world's second largest petroleum consumer and the world's third largest petroleum importer proves Longxue has made the right decision on VLOC and VLCC. Although China is importing more than 150million tonnes of crude oil, Chinese fleets are carrying about 20% of the cargo.

Furthermore, as explained by general manager Chen Liping, the "three musketeers" will make the joint venture a definite success because Baosteel helps with cost control while China Shipping brings in new orders.

Besides shipbuilding, Longxue will also do repair and the construction of two dedicated docks has been completed. Dock 1 is 360m by 65m by 13.3m and Dock 2 is 300m by 74m by 13.3m. The outfitting wharf is 1500m. This ship repair sector targets to repair 140 ships annually and generate business revenue of RMB1.437billion (US$2.1million) annually.

Longxue also has a sector engaging in building special ships and offshore projects. This dock is 360m by 96m by 14.3m, while the outfitting wharf is 1050m. This sector is aiming at building two semisubmersible platforms every year. Longxue will have an area for offshore platform cranes and deck machinery manufacturing, which might be involved with military products according to rumours in the market.

Compared with the Bohai Rim and the Yangtse Delta, the other two shipbuilding bases in China, Longxue is rather backward in terms of assembly capacity and local equipment installation ratio. According to Yu Baoshan, general manager of CSSC Guangzhou Industry Co., Ltd., the output of Guangdong was 1047million dwt, accounting for only 5% of national total in 2007 while the expected capacity in 2010 is 4.5million dwt. The expected capacity of Shanghai, Jiangsu and Zhejiang, however, will be 27.75million dwt in 2010.

The output of the marine equipment manufacturing industry in Guangdong was RMB600million (US$87.7million) in 2007 while that of Shanghai was RMB2.24billion (US$3.2million). Oil reserves in the South China Sea are about 25-30billion cbm, accounting for one third of the country's total. However, even now, there is not an offshore manufacturing base of considerable scale in the Pearl River Delta to serve this purpose.

"With Longxue production in full swing, the situation that the south is weaker and the north is stronger in terms of shipbuilding will be eventually reshaped," said Mr Chen. *NA*

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Contracts? What contracts?

Owners look to refund clauses to save them from taking delivery of unwanted newbuilds. As the market has turned yards and owners have become increasingly embroiled in battles whose winner is the one without the ship.

During the hot market, contracts were concluded at any price, but the participants seemed to lose sight of the fact that they were not buying a ship but a contract.

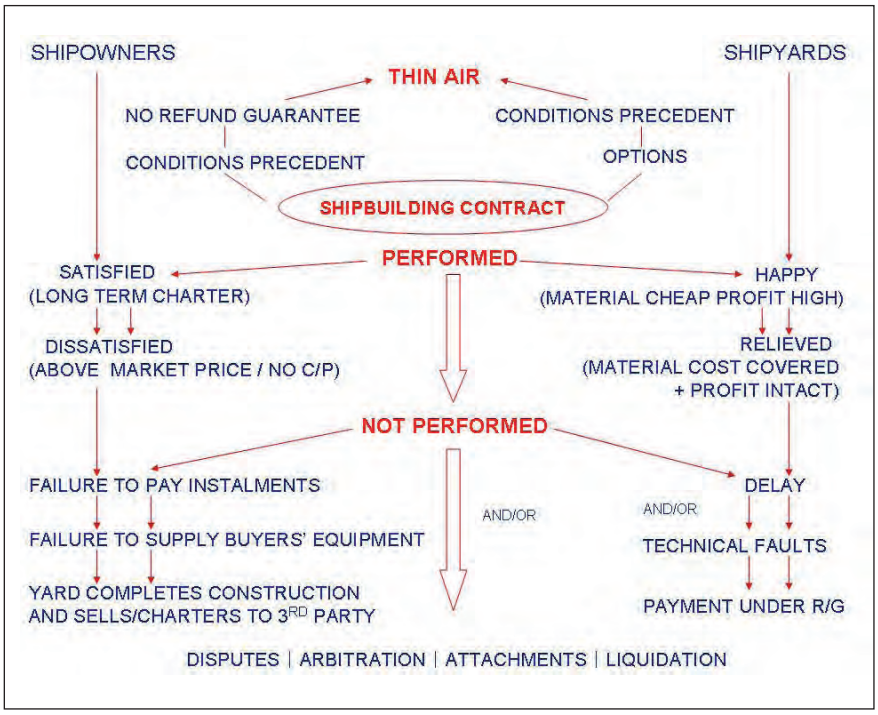
Contractual terms were not always given very much attention and became even more problematic when shipbuilding contracts became financial instruments trading as resales in the secondary market of shipbuilding. Many buyers entered the market with only the intention to onsell or novate as the main objective, which in turn meant that there was a tendency of buyers to conclude more contracts than needed. As with derivatives, legal problems abounded.

When the market was still in a strong position, the lack of refund guarantees for genuine reasons became the pressure valve as shipbuilders had taken too many contracts or wanted to reallocate their slot to take advantage of better terms on offer from a new buyer. Delivery delays were prevalent as a fact of construction bottlenecks, but owners used the delays as a means to renegotiate price upwards with a nod from the buyers' bank.

Buyers still accepted price hikes to existing contracts and impatiently waited to take delivery in a booming market.

The usual end result in the pre-crisis era was that ships were delivered to specification with improving quality. There were frequent requests to increase the price, but generally within levels acceptable to buyers. Given the number of ships built and delivered, there were very few arbitrations and of the arbitrations commenced, very few were taken to a final award.

As the market collapsed, Buyers preferred to find grounds to cancel rather than take delivery if they could find a means cancel under the terms of the contract and still recover the instalments under the refund guarantee. Buyers simply won't accept delay by sellers and every day counted against the yard as Buyers tried to stretch the delay to the magical six months when it could cancel and get a refund.



The many factors of building a ship.

If there was no delay, the buyer would then look for other grounds to cancel such as through technical defects and legal defects.

Sellers (shipyards) are, therefore, desperate to deliver on time. They will also keep a close eye on the payment guarantee, while also having to meet all the demands of over-demanding superintendents who work for the shipowner.

Chinese shipyards have the security of the buyer payment guarantees, but Korean yards are not so fortunate. Chinese shipyards deal with the issue of cancellations and delays on a case by case basis. Some Chinese shipyards may be given assistance but it will become even more difficult for smaller yards to obtain refund guarantees.

The Chinese export market may be replaced by the domestic market, while overseas buyers are finding a level of cooperation not found before.

Before the global financial crisis, delay was both a shield and a sword for the sellers.

Today, delay is a ticking time-bomb which can ruin the contract for the sellers. Technical superintendents working for the buyer have a field day finding technical faults.

If time runs out for the sellers, the bomb goes off by valid demand under refund guarantee.

If the owner can escape delivery due to non-performance, then the refund guarantor bank may be the one left holding the unappealing task of paying the shipowner the instalment payments. The partially built ship could end up in the hands of the shipyard, who would become an unintentional shipowner. *NA*

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Shipbuilding market distortions to be examined by OECD

Even in the face of a severe financial downturn China's shipbuilding industry is gearing up for expansion through significant investment. But there will be some restructuring of the industry as a consequence of this new investment.

Although China is not a member of the Organisation of Economic Cooperation & Development (OECD), it participated as an ad-hoc observer in the OECD Council Working Party on Shipbuilding in Paris on 9-10 July.

During the most recent gathering in Paris, a presentation by the Chinese Association of National Shipbuilding Industries (CANSI) pledged: "We will obey the market law", making the specific points that:

- Shipyards with poor technique and management should be eliminated
- Speculators in shipping and shipbuilding should foot the bill
- The more competitive shipyards should survive
- The industry structure should be optimised.

At the same time, the presentation by the China Association of National Shipbuilding Industry demonstrated some stark facts about soaring shipyard capabilities in the face of a collapse in demand.

In the first five months of 2009, the value of total industrial output by domestic shipyards reached RMB203.3 billion (US$30.0 billion), up 38.8% year-on-year. New ship orders in the first five months were 1.18million dwt down, 96% from the same period last year.

As any businessman or bureaucrat will tell you, new orders are necessary to replenish the backlog to keep shipyards working at an optimum output level. Under such circumstances, said the Chinese presenter: "The shipyards are trying their best to cope with crisis", by negotiating with shipowners and taking a more flexible attitude to pricing and delivery.

The risks in the short term are that there will be "more cancellations if shipbuilding finances don't get better" with newly built and greenfield shipyards facing the greatest danger.

The Chinese solution is to not entirely rely on the market mechanism, but the direction of support is aimed more at clients (and even other shipbuilders) than at the government. "We need more communication and understanding, not only among shipbuilders, but between shipbuilders and shipowners," concluded the Chinese remarks, while also suggesting that shipbuilders "work collectively on our common challenges, which will be aimed to shorten the crisis, and stimulate the revival of the industry."

> "The 2009 to 2011 package has been approved by the State Council. One of the features that stands out has been the freeze on the construction of new drydocks"

The Chinese attitude was a broader approach than that usually seen in such forums where there is a thinly veiled pointing of fingers as to which country's expansion has triggered the crisis. Such diplomatic venues generally result in a classic game of 'ping pong' with rising powers such as Korea defending expansion and the established shipbuilding powers such as Japan and Europe determinedly protesting against any type of government support.

One key issue for OECD would be a potential consensus to discuss a new shipbuilding agreement.

The previous talks died in September 2005, but there could be a revival of the concept to prevent provision of state subsidy or price dumping in a bid to secure a fair competitive environment for the world's shipbuilding industry. The previous agreement did not take effect owing to the USA's withdrawal from the accord, which then meant that there were unsuccessful talks from the end of 2002 to 2005 including all major shipbuilders plus non-OECD member China.

Moving forward, market distorting factors will be examined in detail at an OECD workshop to be held back-to-back with the December 2009 meeting of the OECD working party on shipbuilding, WP6, and the detailed inventory of support measures maintained by the WP6 will be updated in preparation for that workshop.

In February 2009, China issued the adjustment and revitalisation plans for the Chinese shipbuilding industry covering the following six key points:

- China's financial institutions to open credit to exporting shipyards
- Incentives for domestic owners to buy ships abandoned during construction
- Support for yards committed to offshore capabilities
- Yards with excess construction capacity to turn to ship repair
- Consolidation of shipyards to be encouraged
- Replacement of China's ageing domestic fleet.

The 2009 to 2011 package has been approved by the State Council. One of the features that stands out has been

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the freeze on the construction of new drydocks. Most observers point out that such a restriction has little practical impact because it is unlikely in the current environment that any investor would want to pour money into a new facility.

In addition, most observers recognise that the central government's ban on any new drydocks without approval from the central planning department was largely ignored in the past decade. The feature on incentives for domestic owners has been highlighted, but there do not appear to be many tangible cases of this happening. Most domestic owners are not interested in taking over ship contracts, though there has been some ordering of vessels for coal shipments to domestic power plants.

One of the other tangible steps has been to tighten the age limits on domestic coastal shipping and by forcing the scrapping of older domestic tonnage this would apparently lead to the creation of new business for Chinese yards building smaller coastal vessels.

Otherwise, many of the other measures are supportive steps that were already in place, rather than anything new. The 17% VAT rebate for domestic buyers of ocean-going vessels will be extended to 2012 and general support from state banks has long been in place. What is different is the scale of what the banks are pumping into the system.

Starting in late 2008, there were already a number of decisive steps to ease the liquidity crisis in shipyards.

In November 2008, the Export-Import Bank of China set up a credit facility of US$10billion for commercial banks in Zhejiang province to help them provide their refund guarantee (RG) to shipyards. The bank's Ship Finance Division told a local paper that the bank will be making US$8billion to US$10billion available to up to six Zhejiang province banks for RG provision to shipyards. Three yards that will be eligible for the credit facility are Zhejiang Shipbuilding, Zhejiang Ouhua Shipbuilding and Zhoushan Jinhaiwan Shipyard.

China Exim Bank had already carried out a similar support measure in Jiangsu in 2008 by funnelling fresh funds that totalled an estimated US$10billion into local banks. It injected US$3billion into banks in March to help them issue an RG to Jiangsu New Times Shipbuilding and disbursed US$3.5billion in July in a similar operation targeted at Yangzhou Dayang Shipbuilding.

China Exim Bank also arranged another credit line totalling US$2.5billion for Jiangsu Yangzijiang Shipyard. Other banks are also helping local shipyards. Shanghai Pudong Development Bank has reportedly tied up with the Nantong municipal government in Jiangsu province to make fresh loans totalling RMB2.6billion to 10 shipyards and marine equipment manufacturers based in Nantong.

Jiangsu Rongsheng Heavy Industries Group and Nantong Huigang Shipbuilding are among the 10 enterprises. The Dalian branch of China Development Bank and the Dalian municipal government in Liaoning province are also providing assistance to local companies such as US$500million for COSCO Shipyard.

In April 2009, the effort was extended to the big state yards.

China Export-Import Bank extended loans of RMB100billion (US$14.6billion) to CSSC and RMB60billion (US$8.7billion) to China Shipbuilding Industry Corp. This support is on top of the US$2billion buyer's credit and US$5.7billion export seller's credit extended by China Exim at the end of the first quarter of 2009. The outstanding letter of guarantee for shipbuilding projects reached US$12billion.

Then in July 2009, CSSC & Bank of China (BoC) signed a strategic cooperation agreement with BOC offering an RMB80billion (US$11.6billion) credit loan to support CSSC's shipbuilding, repair and marine equipment development. BoC will also supply buyer's credit to support CSSC to execute its export orders. By the end of May 2009, BoC has opened guarantee letters and offered loans with total value of RMB130billion (US$3.8billion) to domestic shipbuilders.

Amongst other financial support deals, in March 2009, Bohai Bank Hangzhou Branch signed a strategic cooperation agreement with Zhoushan Jinhaiwan, the largest shipbuilding enterprise in Zhejiang Province. Finally, as a symbol of Chinese state banks backing the bigger private yards, China Development Bank has given Rongsheng a RMB3.8billion (US$5.5billion) loan for the construction of their fourth drydock which measures 39.5m×580m. *NA*

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Haeusler successfully enters shipbuilding business in China

Swiss metal forming machine company Haeusler set out just over two years ago to establish a cooperation between itself and the China state shipbuilding industry.

In 2007 the first contract was signed between China Shipbuilding & Offshore International Co. Ltd and Haeusler featuring the delivery of a ship plate bending machine type SPBM-hy 21000/2400. The machine was designed for bending of metal plates to cylindrical and conic sections or other shapes for ship hulls. A further three contracts have now been signed between Chinese shipbuilding companies and Haeusler for similar machines.

The contracts specify that certain machine components are to be fabricated in China. For this reason, Haeusler has had to adapted and modify their normal project planning, handling and logistics. All critical machine components are made in Switzerland while other components are provided by China. The first machine was commissioned and is now in operation in Qingdao city.

All these SPBM type machines have been designed to bend plates of maximum 21m width, a maximum length of 4 to 5m and a maximum thickness of 40mm. The three roller symmetrical structure consists of one top roller and two bottom rollers driven by hydraulic motors. The main machine features are excellent pre-bending and round bending accuracy, uniform plate thickness after the bending process, special control functions, high safety standards and an improved processing efficiency compared to some traditional machine types.

The operator can choose between two operating modes – rotation bending (for cylindrical or conic sections) or press bending (for special shapes).

Rotation bending is carried out by rotating top and bottom rollers. Both, symmetric and asymmetric bending is possible. While symmetric bending is used for final rounding of the plate, short straight ends can be achieved using asymmetric bending.

Press bending allows the forming of profiles. For this operating mode, additional pressing tools are mounted underneath the top roller. Various dies with different radii for various bending angles can be used. A proper pressing tool can be chosen depending on the tool diameter needed for the intended bending task. *NA*

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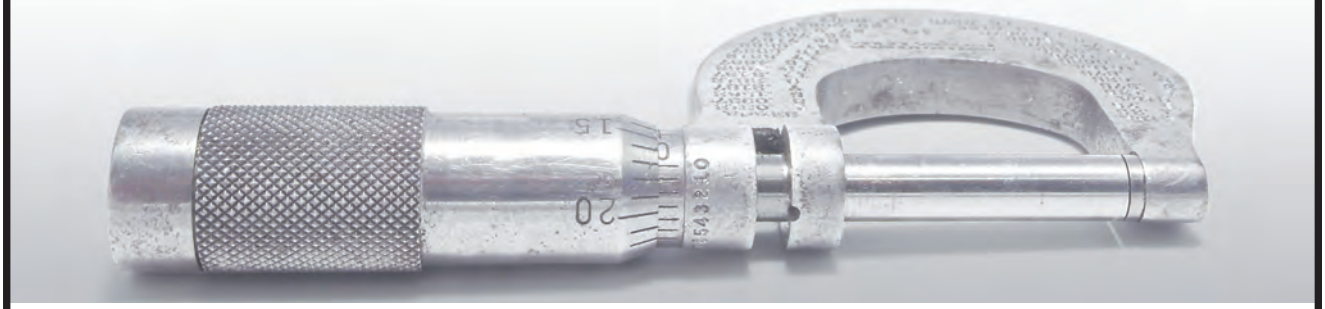

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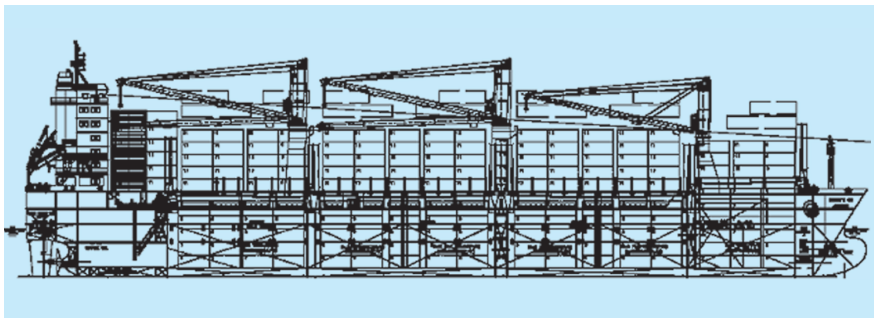
Odely's quality philosophy maintains the company through the downturn

Meeting the challenges offered by this years recession in shipping is about maintaining quality and creativity, rather than a drive to increase its profits. Even so, Odley Marine is still taking on staff in the midst of a the worst global slowdown since the 1930s.

Liang Zongqing and Li Chen, sitting leisurely in their comfortable office surrounded by models of ships that their company has designed, will strike visitors with the impression of a client and staff-oriented company. Mssrs. Liang and Li will readily agree to the impression that Odely Marine is not one of the stereotypical Chinese companies that is pursuing size and expansion speed as their primary measures of business success. Their vision is for Odely Marine to first make its clients happy, supported by the secondary agenda of keeping its staff happy.

These factors, in the eyes of Mssrs Liang and Li, are the two keys of business success.

Rather than cut manpower, Odely Marine has newly recruited three staff to enhance its team.



28,000dwt MPC.

Another proof of the strong financial status of Odely Marine is that it will increase its registered capital from the original US$300,000 in 2002 to RMB5 million (US$3million).

Odely Marine's full name is Shanghai Odely Marine Engineering Co., Ltd., one which evolved from a joint venture set up by a German registered trading company called Odely and Shanghai-based Marine Design & Research Institute of China (MARIC) in 1994. With this joint venture, MARIC held a 30% stake with investment in the form of human resources, intending to open up its presence in the European market. Mssrs. Liang and Li, both former MARIC staff, were dispatched to the joint venture as part of MARIC's payment in kind.

Seizing the chance to take command of a business that they loved to be involved in, Mssrs Liang and Li bought this joint venture over at the end of 2002. This was immediately after Mr Liang was offered the position of technical director in Waigaoqiao, which was at its initial stage of development when Mr Li was also deputy technical director of MARIC.

"We firmly believe that we can create a much better world," said Mr Liang, summarising their perspective on business purpose.

So far, Odely Marine has successfully developed the designs of a 16,500dwt chemical tanker, a 25,000dwt MPC heavy lift, 28,000dwt MPC heavy lift, 35,200dwt Lakermax, 33,500dwt Bulker, 1300TEU containership, plus a 3500m^3 and 5000m^3 LPG vessels.

"We are not competing against SDARI or MARIC, both of which are established design leaders in mega ships. We focus on the niche of smaller sizes. Our products may not be extensive in variety but definitely stand out for their superior performance," Mr Li said. "Also, our clients need our technical support, something which is not possible from major design houses." Mr Li is more of a leader in charge of the development of new products while Mr Liang focuses on marketing and management.

Take the 16,500dwt chemical tanker as an example. With great efforts on optimisation in the initial stage including FEM analysis and two rounds of model tests, the high-performance design ended up with more than 100 ship orders from owners in Europe, America and Asia at Chinese yards.

Odely Marine is developing a 30,000dwt and a 55,000dwt common structural rules (CSR) compliant chemical tanker based on its successful experience, which will hopefully make it into a long series like all other projects.

TECHNICAL PARTICULARS

28,000dwt MPC

Loa abt.	166.31m
Lpp	158.32m (CSR)
B	27.40m
D	14.20m
Draught (designed)	8.50m
DWT	28,000tonnes
Draught (scantling)	10.10m
Service speed	15.2 knots designed
Endurance	15,000nmile
Complement	30 persons
Fuel oil consumption	abt. 26.55 tonnes day+5%toler (F.O. 10,200kcal/kg under ISO)
Capacity	
Container (8') total abt	1693TEU
In hold	736TEU
On deck	957TEU
Reefer	100 on Deck
Cargo hold	100%39,100m^3
Fuel oil	1,400m^3
Diesel oil	150m^3
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Compared with a typical MPC design in the market, the Odely 28,000dwt MPC design has a steelweight of 1000tonnes less than other designs in the market, but offers a deadweight of 1000tonnes. "This is the most compact and economical MPC of this size with the highest performance up to now," Mr Li said proudly. Convinced by this novel design, COSCO has turned to Odely Marine and ordered eight in Huanghai Shipyard. Other owners including Intership have ordered more than 40 such MPCs. Meanwhile, their DSS 33,500dwt Bulker has 10 ships and the Ice Class IA 1300TEU containership has 13 orders with effective contracts.

Another representative of Odely Marine's brand products is the 35,200dwt DSS Lakermax. Without any ballast the ship can allow two of its six holds to be empty and with an even keel when loading grain in the Great Lakes. Canfornav and Fednav, the two dominant players in the Great Lakes area, have ordered 15 including six from New Century, three in Shanghai Shipyard and six in Tianjin Xingang.

The design of the 5000m^3 fully pressurised LPG carriers opens up the profile of Odely Marine even further. PT. Pertamina has placed a 1 plus 1 order from Taizhou Wuzhou Shipyard. Odely Marine's track record in this area, three 3200m^3 LPGs have been delivered to I.M. Skaugen. Odely Marine also won the bidding of three 3500m^3 LPG carriers for China Merchants Logistics' LPG shipping subsidiary in November 2008. What stands out for these ships is that the load limit of all cargoes can reach 98%, which is 10 to 15% higher than other Chinese designs. To achieve it they have introduced a new C-tank LPG design concept. "If more design work can bring our client more benefit, we just do it," Mr Liang stressed.

Odely Marine also has an experienced team in offshore auxiliary ships. They have developed a concept for long shaft propulsion together with its noise and vibration control for AHTS to maximise the cement, mud and brine supply capability.

"We only serve decent clients because we can learn a lot and improve a lot through working with them. We always put ourselves in clients' shoes and work out the best solution to maximum their benefits. In return, they never fail us in payment," Mr Liang summarised the development process of Odely Marine. "Furthermore, we seek and develop long-time partnerships with leading suppliers to complete our services." For example, in terms of propulsion and speed, etc., Odely Marine has special dedicated partners such as Shanghai Ship and Shipping Research Institute.

In April 2009, PIL's order for two 600TEU containerships designed by Odely Marine became effective at Penglai Bohai Shipyard, making it one of the few shining stars in this current gloomy era for the newbuilding market and inspiring the industry to wonder why the owner went ahead with such a project. Perhaps it was the prospect of a good design that convinced the owner to proceed. *NA*

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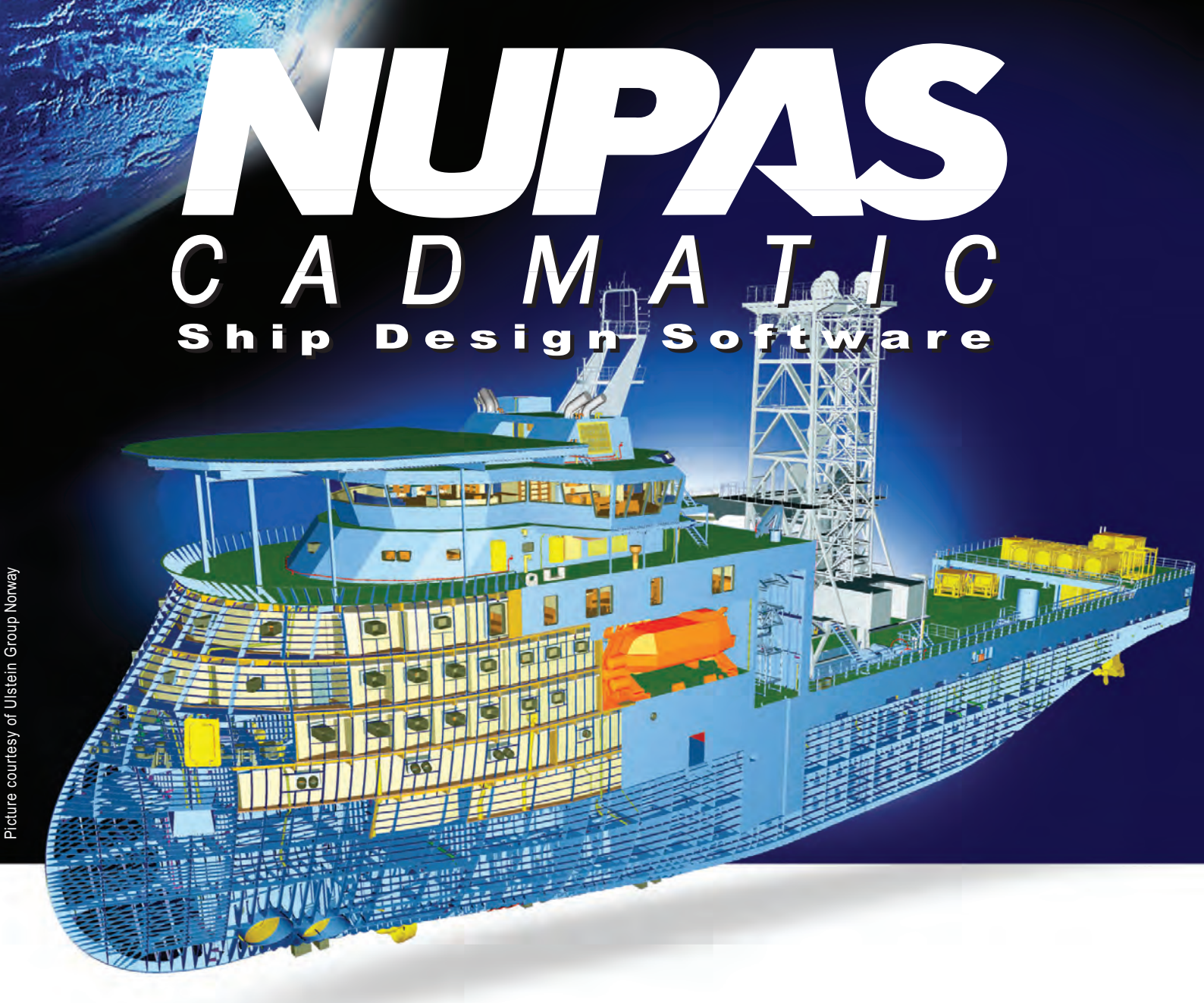

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OPTIMIZING RESOURCES

MSA brings forward the single-hull tanker phase-out dates

Stringent new measures to protect China's coast from pollution have been extended with the addition of smaller tankers being forced to meet the double-hull requirement earlier than at first anticipated.

To reduce the risks of marine pollution within its waters, China's Maritime Safety Administration (MSA) has decided to bring forward the dates that some tankers trading in its domestic waters must have double hulls.

MSA plans to prohibit tankers larger than 600dwt that fail to meet the requirements of MARPOL 73/78 from operating in its territorial waters from 1 January 2010.

Single-hull oil tankers of 5000dwt and above must already meet the double-hull structure requirements on their delivery anniversary in 2010.

However, there will be some flexibility in the system. If tankers have non-cargo carrying double bottoms or side tanks that extend the full length of the cargo tanks; or if they have double hulls that extend the full length of the cargo tanks but fail to meet MARPOL 73/78 requirements for pollution prevention, then the final deadline for such vessels can be postponed to the earlier one of two dates: their delivery anniversary in 2015 or their 25th delivery anniversary.

For existing single-hull oil tankers smaller than 5000dwt but bigger than 600dwt, their final date for meeting the regulations will be the earlier of two dates: their delivery anniversary in 2015 or their 25th delivery anniversary if they trade along China's coast.

If they trade on inland rivers, the layoff day will be the earlier one of the two days: their delivery anniversary in 2030 or their 25th delivery anniversary. If the tankers have double bottoms or side tanks that are non-cargo carrying and extend the full length of the cargo tanks or if they have a double-hull that extends to the full length of the cargo tanks but fails to meet MARPOL 73/78 requirements, the deadline can postponed to the earlier one of their delivery anniversary in 2030 or their 25th delivery anniversary.

From 1 January 2015, domestic tankers larger than 600dwt but non-compliant with MARPOL 73/78 will be prohibited from carrying heavy cargo oil and will not be allowed to call at or work in the Bohai Sea and the Three Gorges area on the Yangtze River. *NA*

Skills shortage sees CCS offer training

Although the maritime recession has narrowed the 'skills gap' class societies are maintaining their training programmes, particularly in China.

China Classification Society (CCS) has newly opened a training academy to facilitate its internal training, following the trend that many international classification societies have been setting up their academies in China to enhance competence of internal staff and also offer external training to owners and shipyards.

CCS' academy is composed of its head office and two training centres, one in Wuhan and one in Shanghai. CCS President Li Kejun will act as director of the academy for the first term. The academy mission is to ensure that CCS staff maintain their knowledge levels and master new technology.

The main functions of the academy include providing training in rules, plan approval, survey, testing, management, among other things, and their qualifications and knowledge are maintained at the required levels as well as offering training on new technology aimed at continuously upgrading the personnel's technical competence and professional levels.

Following the opening of the academy on 2 July, CCS put its knowledge centre – an online platform (http://kc.ccs.org.cn) – into official operation the following week, on 10 July.

"We have developed this knowledge centre so as to explain the related rules and standards and to be able to offer consulting on ship safety and environmental protection," said Mr Li.

CCS was evolved from China Ship Registry which was originally founded in 1956 by the Chinese government at the suggestion of Russian experts. In 1958, China Ship Registry was renamed China Ship Inspection Bureau. In 1986, approved by the State Council, China Ship Classification was set up so it could join IACS, an application that was accepted in 1988.

It is now one of the 10 full members of IACS, and has held the chair of the IACS Council twice, in 1996-1997 and 2006-2007.

CCS' highest class notation has been included in the Classification Clauses of the Institute of London Underwriters (ILU). Up to the end of 2008, CCS had been authorised by governments of 28 countries or regions to perform statutory surveys for the ships flying their flags. CCS is also an associate member of the International Association of Dry Cargo Shipowners (INTERCARGO) and the International Association of Independent Tankers Owners (INTERTANKO). CCS has established 58 branches/offices both at home and abroad offering a global service network. By the end of 2008, CCS classed fleet totalled 2077 ships with 29.07million gross tonnes. *NA*

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Beluga gets heavy with P-series

With a current trend in the market for heavy-lift vessels due to cargoes getting bigger and heavier, Beluga Shipping GmbH has 16 specialised heavy-lift vessels on order, named the 'P-series' with the first two vessels set to enter service this year.

"We assume that the market situation especially for the transportation of extremely heavy cargo items over and above 500tonnes will remain firm and stable," says Niels Stolberg, CEO, Beluga Shipping.

Beluga says that is has not been affected by drawbacks or reductions in the current economic and financial crisis. With the heavy-lift market still relatively stable the planned newbuildings on order are fully financed ensuring the future of the vessels. The current slump in the cargo segment is hitting the market below crane power of 200tonnes, whereas the segment for 350/400tonnes is more stable, and the sector above 800tonnes being a highly interesting field for development.

Beluga has adapted to the heavy-lift market that is evolving from the growing oil and gas segment, but also port expansions, power plant constructions and developments in the offshore wind industry. "We have to carefully watch factors we cannot influence and we have to work hard as a team, optimise internal processes, even intensify our direct customer's approach and believe in the global economic stimulus packages to be successful – then I am convinced, we will overcome the crisis," explains, Mr Stolberg, on the challenges of today.

The fleet strategy for the P-series has been specifically aimed at the target market for very heavy items that weigh over 100 tonnes a piece. The fleet of 16 vessels that are on order from Beluga shipping are currently under construction with delivery dates between 2009 and 2011. The vessels will have load capacities of 20,000dwt and have crane capacities of up to 1400tonnes.

A fixed element of Beluga's fleet strategy is its focus on three types of vessel and diversification of fleet deployment says Beluga Shipping. The ships of the E/F series, R/C series and P1/P2 series will all offer identical components so that clients will not be dependant on the availability of a specific vessel.

Beluga Houston **one of the first P-series vessels to be delivered in November 2009.**

With the increasing demand from clients for more flexible, deployable vessels that can carry large cargoes, due to plant modules and port cranes being shipped as more or less complete structures saves clients assembly costs at the other end.

Mr Stolberg outlines the task ahead for P-series project: "We have to be able to load and discharge the heavy goods as safely and as close to the destination as possible – regardless of the existing port infrastructure. For this reason we offer international clients a large number of identical vessels within our fleet that can be deployed flexibly according to the requirements. In addition, the storage space can be adapted in an individual manner by means of adjustable tweendecks for example. Large cargo hatches enable transports of pieces that are up to 90m

TECHNICAL PARTICULARS

Beluga P-1 series

LOA 166.00m
LBP 156.00m
Breadth mld 22.90m
Draft 9.50m
Depth mld 13.90m
Air draft ..... 45.62m (36.12m + 9.50m draft)
Deadweight excl.twd 19,100dwt
Grosstonnes 15.312gt
Flag ..... Antigua/Barbuda/German
Builders/place/date ..... Volharding shipyards, The Netherlands in cooperation with Qingshan Shipyard, China, 2009-2011
Type ..... Heavy-lift multipurpose dry cargo vessel strengthened for heavy cargos, equipped for carriage of containers, geared, tweendecker/singledecker
Main engine ..... MAN 7L 58/64 9800kW
Bow thruster ..... 1 x 800kW
Rudder ..... Freehanging flap type
Aux. Engine ..... 3 x 590kW
Emergency diesel ..... 1 x 590kW
Shaft generator ..... 1 x 1550kW
Cranes ..... 2&3: 2 x 400mt SWL El-Hydr.Cranes NMF, Combinable up to 800mt SWL; Crane 1 1 x 120mt SWL EL-Hydr. Cranes NMF Outreach Cranes 2&3: 18m/400mt, 30m/ 200mt, 19m/95mt, 24m/75mt, 32m/55mt
Load distribution
Tank top ..... 18mt/m^2
Stack load 20TEU:100mt. 40TEU:135mt
Hatch cover payload ..... 8mt/m2 (For pontoon covers forward of hatch 2 (For hydr.-folding covers) 4m/m^2
Stack load 20TEU:60mt, 40TEU:10mt
Tween deck ..... 3.5mt/m^2

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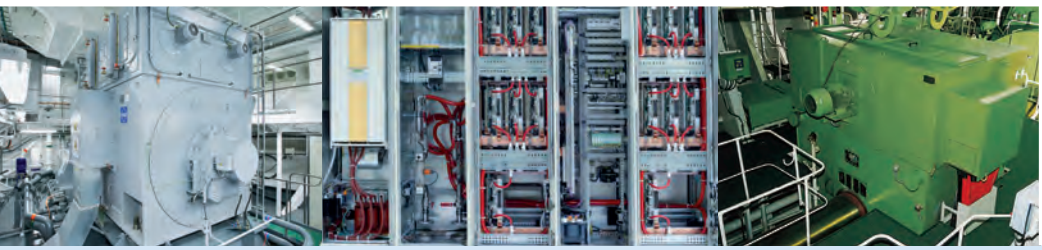

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Beluga's P-series will see the launch of 16 heavy-lift vessel.

long. Since our ships have a low draft, we can call nearly any port in the world, which is indispensable in tramp shipping."

Beluga Singapore (ex. *Beluga Persuasion* –originally named) will be the first vessel to be launched from the series that "will strengthen the fleet currently consisting of 66 modern multipurpose heavy-lift project carriers in this year," says Beluga Shipping. *Beluga Singapore* is currently under construction and is due to be delivered in October this year. Two crane operators will work in synchronisation onboard *Beluga Singapore* to operate the cranes in tandem to move heavy cargo that it will carry. Adding to this the vessel features a large hatch opening of 86 x 18m and tweendeck that offers space on four levels.

"One example is the shape of the hull: By extensive model test in the towing tank we optimised the hull with respect to resistance, sea-keeping and manoeuvrability" comments, Mr Stolberg on the flexibility of the design of the vessels.

The P-series consists of two designations that of P1 and P2. The main difference between the two designations is the crane and load capacities that the vessels will be able to handle. The vessels in the P1 series will have a tonnage capacity of approximately 19,100dwt, whereas P2 vessels will have a capacity of roughly 20,000dwt. Crane capacities will have a maximum capacity of 800tonnes, all cranes on P1 and four on P2 vessels, and 1400tonnes onboard P2 vessels, in tandem usage. The holds of the vessels will differ slightly, P1 vessels will have a hold dimension of 86.10m x 18.00m and P2 vessels will have a dimension of 82.40m x 18.66m.

Another feature of the vessels in the P-series will be that they will be able to travel through polar conditions and will have the highest ice class E3 notation, which will allow the vessels to travel the north-east- passage for in the region of two to three months of the year. This will significantly cut transport time and distance, but Mr Stolberg intends to take the vision further with initial test runs being carried out for the vessels to travel across the Northeast Passage along the Siberian coast.

The vessels will also have onboard ballast pumps to compensate for heeling of the vessel when loading and offloading. Bremen-based RWO GmbH will supply its CleanBallast, ballast water treatment system to Beluga to be installed onboard all vessels. Mr Stolberg points out that this is a valuable aspect for further market-orientated growth, due to handling larger cargoes where efficient handling of ballast water is needed and also tackling with the problem of marine pollution.

Adding to the environment efficiency of the vessels, two of the vessels will be equipped with the towing kite propulsion system Skysails. The kites will provide a sail surface of 600m² each, with fuel savings estimated at 10tonnes per day.

Six multipurpose heavy-lift project carriers of the Beluga P1-series with crane capacities of 24 x 400tonnes plus 1 x 120tonnes are to be built at Quingshan Shipyard in Wuhan, China. 10 units of the Beluga P2-class are to be built at Hudong-Zhonghua Shipbuilding Co. Ltd. Yard in Shanghai. These units subdivide into four multipurpose heavy-lift project carriers with crane capacities of 2 x 400tonnes plus 1 x 120tonnes, and six multipurpose heavy-lift project carriers with crane capabilities of 2 x 700tonnes plus 1x180tonnes. *NA*

TECHNICAL PARTICULARS

Beluga P-2 series

LOA	168.68m
LBP	155.79m
Breadth mld	25.20m
Draft	9.50m ssw
Depth mld	13.85m
Air draft	45.15m (36.65m + 9.50m draft)
Deadweight excl.twd	
(P2-800)	20,000dwt
(P2-1400)	19,700dwt
Flag	Antigua & Bemuda/German
Builders/Place/Date	Volharding Shipyards, The Netherlands in cooperation with Hudong Shipyard, China, Shanghai, China, 2009-2012
Type	Heavy-lift multipurpose dry cargo vessel strengthened for heavy cargo, equipped for the carriage of containers
Main Engine	MAN 7L 58/64 9800kW
Bowthruster	1 x 800kW
Rudder	Freehanging flap type
Aux. engine	3 x 850kW
Emergency diesel	1 x 150kW
Shaft generator	1 x 1550kW
Cargo handling	P2-800: Cranes 2&3: 2 x 400mt SWL El.-Hrdr.cranes NMF, combinable up to 800mt SWL; crane 1: 1 x 120mt SWL El.-Hydr. cranes NMF; Outreach: cranes 2&3: 18m/400mt, 22m/325mt, 30m/200mt, 33m/ 40mt (auc. Hoist); crane 1: 16m/120mt, 19m/95mt, 24m/75mt, 32m/55mt P2-1400: cranes 2&3: 2 x 700mt SWL El.-Hydr.-cranes NMF, combinable up to 1400mt SWL; crane 1: 1 x 120mt SWL El.-Hydr cranes NMF; Outreach cranes 2&3: 14m/700mt, 21m/500mt, 26m/400mt, 30m/350m, 33m/40mt (aux hoist); crane 1: 16m/120mt,19m/95mt, 24m/75mt, 32m/55mt
Load Distribution	
Tank top	18mt/m²
Stack load	20TEU:90mt, 40TEU:105mt
Hatch cover payload	8mt/m² (for pontoon hatch covers forward of hatch 2)
(for El.-Hydr.-folding cover)	4mt/m²
Tween deck	3.5mt/m²

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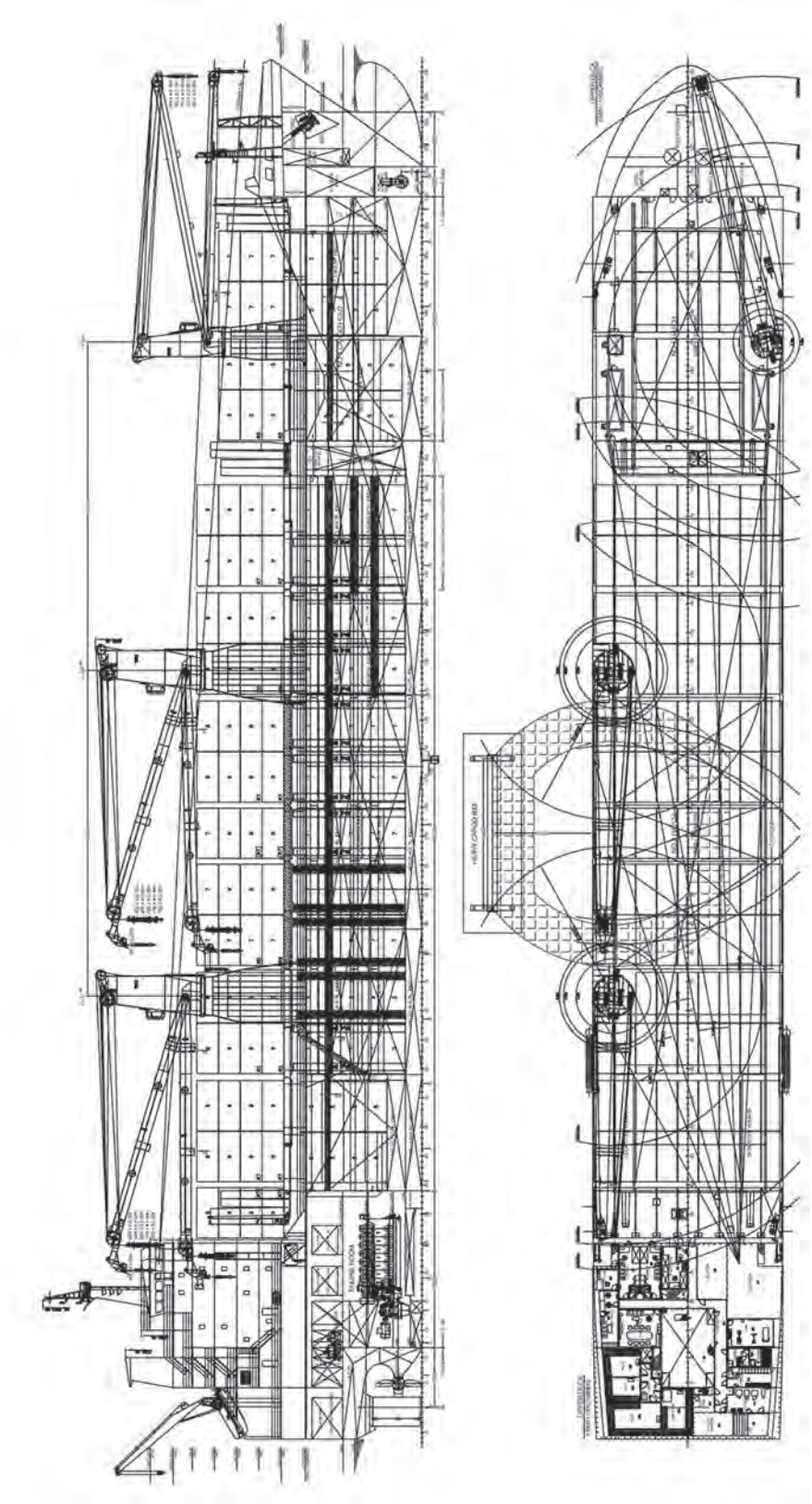
GA: Beluga P-series.



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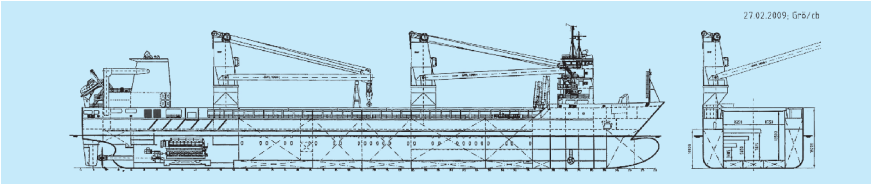
Heavy duty JJ Sietas moves into new market

Since securing its first order for its latest type 183 design heavy-lift vessel and breaking into the very heavy-lift market JJ Sietas has gone from strength to strength.

Over the past 16 months Schiffahrtskontor Altes Land GmbH & Co. KG (SAL) has taken delivery of four heavy-lift vessels from JJ Sietas shipyard. To date the Sietas yard has delivered five vessels and has eight new ships on its order book. The recent commission from SAL will see a further two heavy-lift vessels being built at the German-owned shipyard to cater for the growing offshore market, totalling €120 million (US$169.4million).

"The global economic crisis has also had an effect in the heavy-lift sector. However, we are already seeing signs that the market will recover in 2011. We have already received enquiries for expansive orders from the wind energy sector, as well as from the oil and gas industries. To make sure that we are properly equipped, we are investing in two innovative heavy-lift vessels, with which we can consolidate our leading position in the word market," said Lars Rolner, managing director, SAL.



GA plan of Heavy-lift vessels for SAL.

SAL shipping has been working in cooperation with Sietas managing directors Rüdiger Fuchs and Rüdiger Wolf since March last year, to produce the latest type 183 heavy-lift vessel. Working closely with the team has been Neuenfelder Maschinenfabrik (NMF) a subsidiary of Sietas Group in the development of the cranes that will be fitted onboard the vessels.

Sietas has said that the vessels will be the largest and most modern heavy-lift ships, based on the current market demands and developed with innovation in mind. With 29 years experience behind them, the yard feels that now is the right time to move up the scale in the heavy-lift market.

Rüdiger Fuchs, CEO, Sietas Group comments on the latest order from SAL: "At this point in time, the SAL order is playing a decisive role for our company. The order is helping to propel the Sietas shipyard in to new waters. The SAL order is an elementary component in our shipyard's new orientation towards the highly competitive special-purpose shipbuilding market. We are grateful for the faith that our long-established partners from SAL have shown in our company's new course….

"With the development and construction of the two type 183 heavy-lift vessels, we are happy to have been given the opportunity to demonstrate our maritime group's consummate proficiency with regard to designing and building innovative special purpose ships. The Sietas yard and the Neuenfelder Maschinenfabrik are working hand in hand on this project. SAL will benefit from the coordinated and calibrated quality components, as well as the short processing times and the swift delivery times," Mr Fuchs, later added.

The type 183 vessels will be capable of lifting 2000tonnes and will have a speed of 20knots making them the fastest, largest vessels in the offshore market says Sietas. To be able to handle such large volumes of cargo the vessels have been classed to allow them to trade with open hatch. Powering the vessels will be a MAN 58/64 diesel engines capable of 17,136hp, and a bow thrusters, at 1632hp. The vessels with be fitted with two electrical-hydraulic turning cranes with a lifting capacity of 1000tonnes SWL each, with a total lifting capacity of up to 2000tonnes SWL, will be mounted on the portside.

The vessels will incorporate the latest 'green' regulations and be ISO 14001 and OHSAS 18001 certified and will have a green passport from Germanischer Lloyd with waste water treatment facilities installed onboard. Adding to the vessels 'green image' is that the main engine will be able to burn IFO, gas oil and low-sulphur gas oil, helping to reduce emissions further.

The vessels are scheduled for delivery in December 2010 and March 2011 with the project being financed by HSH Nordbank. *NA*

TECHNICAL PARTICULARS

Heavy-lift vessel type 183

Class	Germanischer Lloyd ✠100 A5 General Cargo Ship, BWM-S, EP, Heavy-Lift Ship, Solas II-2 Reg 19,✠MC AUT
L o,a	159.80m
L b.p	148.31m
Beam	27.50m
Depth	13.80m
Draught Max/Design	9.00m/7.50m
Speed	20knots
Deadweight	12,500/7500dwt
Gross tonnage	15,200gt
Net tonnage	4600nt
Hold capacity	19,100m³
Engine	1 x medium speed diesel 12,600kW reduction gear 2 x diesel generators 1100kW 1 x diesel generator 595kW 1 x emergency diesel generator 200kW 1 x shaft generator 1500kW
Propulsion	1 x bow thruster 1200kW C.P propeller
Cranes	2 x El.Hydr turning cranes, SWL 1000tonnes at 14m (770tonnes at 26.0m/500tonnes at 38.0m)

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RWO keeps up with environmental regs

Breman-based RWO GmbH has announced the latest development of its membrane bio-reactor for sewage treatment (SWT) onboard vessels that will meet the MEPC 159(55) regulation that is due to come in to effect in 2010, as well as the take over of Krüger-Wabag's "Memrod" business.

Membrane technology for sewage treatment has only previously been applied to Navy and cruise vessels, the regulation that comes in to effect next year will see the technology adapted for use onboard merchant vessels as well. The International Maritime Organization (IMO) regulation will bring in a more stringent limit of values for effluent water from marine sewage treatment plants. See figure 1 for limit values of MECP 2 (VI) compared to MEPC 159 (55).

Further, RWO has announced that it has taken over Krüger-Wabag's Memrod business unit. All water treatment for ships and offshore platforms offered by the Veolia water solution & technologies will now be handled through RWO in Bremen.

Krüger Waag GmbH had previously, at its site in Ratingen, developed and further expanded the business unit 'membrane sewage treatment plants for ships' under the designation Memrod. With the transfer of these activities to RWO it has taken over the overall responsibility for the existing references and current projects and will now manage the further development of this technology in technical and sales terms.

The two units work on the same principles and will mean that RWO will now be able to cover all customer markets, with the Memrod system offering a custom made unit that is very compact, has submerged low pressure membranes, outside-in and has Type Approval according to resolution MEPC 159 (55). The system is aimed at covering cruise vessels, navy ships, ferries and mega yachts.

RWO's membrane bio-reactor (SWT) is compact in size and has the advantages of using no chemicals for operation, it is small in volume and footprint, and is efficient at peak loads and reduced effluent values, which will meet the new regulation. RWO has received Certificate of Type Approval for Sewage Treatment Plants issued by the Federal Republic of Germany by See-Berufsgenossenschaft for the unit. The unit will service the markets for merchant ships and small yachts.

RWO covers the market with its latest SWT.

The membrane technology that it uses has a pore size of 0.05micron, with no suspended solids or particles that will be able to pass through the membrane, ensuring an efficient flow of effluent. There is no need for chlorine in the treatment as the filter uses membrane technology that will filter out micro-organisms and bacteria.

The ultra-filtration membranes are arranged in modules, submerged in the reactor and the biologically treated water is drawn through the membrane by pump and discharged outside the ship.

The micro-organism population and the solids contained in the water are completely retained in the bio-reactor. A higher concentration of biomass in the reactor itself has allowed for smaller reactor volumes and a smaller footprint of the units in general. The process does not require any room-intensive and sensitive secondary settling stage.

Although being smaller in size and lighter in weight, the results will offer better results than classic biological systems, says RWO. The biomass can be loaded with a higher concentration of dissolved water contaminants and no obnoxious odours will be emitted, adding another advantage of less excessive sludge production compared to a conventional aerobic biological treatment system.

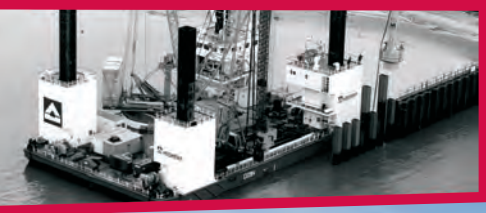
The specific design of the membranes and its arrangement in the reactor ensure a constant cleaning of the membranes in such a way that a continuous flow of small air bubbles passes over the membrane surfaces and removes deposits. This prevents the membrane from clogging, extends the treatment cycles and overall lifetime of the membranes.

A number of Memrod units have been delivered for use onboard mega yachts, cruise vessels, research and navy vessels, as well as container vessel to date. Orders are in place to equip other vessels with the units in the near future. *NA*

	Limit values	
	MEPC 2 (VI)	MEPC 159(55)
Faecal- / thermo-tolerant coliforms	< 250/100 ml	100/100 ml
Suspended solids	< 50 mg/l	35 mg/l
BOD_5	< 50 mg/l	25 mg/l
COD	---	125 mg/l
Chlorine	---	0,5 mg/l

Comparison of limit values MEPC (VI) compared to MEPC 159 .

New build, conversion and upgrade projects



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Becker gets order for KSR

Becker Marine has received an order for two of its newly developed Schilling KSR rudders from Knutsen OSA in Norway.

The order from Knutsen will be for Becker Marine to supply optimised 50.4m² Schilling KSR rudders for a pair of shuttle tankers. The shuttle tankers will be 223.0m in length with a breadth of 42.0m and are 105,000dwt, with a service speed of 14.3knots. The shuttle tankers are currently under construction at Cosco shipyard and are due for delivery next year.

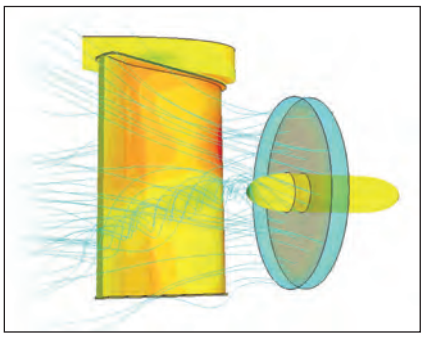
Although the Schilling rudder has been a stable product in the Becker range, it underwent development last year to develop the next generation of rudder, the King Support Rudder (KSR). Compared to the previous models the new profiles will reduce rudder drag by up to 25%, but still maintain an equivalent side force.

The design for the Schilling rudder is available in full spade (Schilling MonoVec) or in semi-spade (Schilling Mariner). The Schilling Navigator rudder design will close the gap between conventional semi-spade and full spade rudders. The latest Schilling KSR rudder will offer large tankers and bulkers the advantages of the high-lift Schilling rudder profile and the enhanced manoeuvrability of a full spade rudder in combination with the KSR support.

The Schilling KSR rudder is a single piece construction with optimised shape and no moving parts, and will improve both course-keeping and vessel control characters. With operating angles of up to 70degs port and starboard, which will be able to control the propulsive force to achieve and efficient 'side thrust' effect at a ship's stern.

The profile of the Schilling KSR rudder incorporates; enhanced high-lift low drag profile, a rounded leading edge promoting good flow properties at all rudder angles, a fishtail trailing edge that accelerates the flow and recovers lift over the aft section of the rudder, end and optional intermediate plates to control propeller slipstream, high rudder balance optimising propeller coverage, fully welded steel construction of the rudder blade, rudder blade to stock connection by keyless conical or flange coupling, single or multiple bearing support with no moving parts.

The full spade Schilling MonoVec rudder fitted on a vessel.



Enhanced by CFD testing the Schilling KSR extends the family of Becker rudders.

Extensive testing of the rudder has led to optimisation of the rudder design, using research and computational fluid dynamics (CFD) techniques and tested by model tests, has allowed Becker Marine to optimise the top and bottom end plates as well as larger conceptual development challenges such as the development of the KSR bearing support arrangement. The improved profile has enhanced the Schilling design by; reducing drag at full scale, preserving the lift characteristics of the Schilling rudder, and moving the main thickness of the rudder to the aft to house the KSR bearing.

All calculations were performed at full scale and proved a rudder drag reduction at normal cruising helm angles of approx. 25%, with the lift (side force) identical to the original section. A new concave streamlined fishtail has been incorporated, which has improved the flow separation characteristics compared to previous fishtail designs. Also, the main thickness of then section has been moved further aft, eliminating the requirement for additional strength 'bulges' for faster vessels and/or cases withy highly loaded propellers.

Further research work with particular emphasis on the leading edge performance under heavy propeller load resulted in an optimised profile, the detailed end-plate optimisation are carried out individually to suit particular operation scenarios. *NA*

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Windlift1 to develop German offshore market

Western Shipyard (WSY) has recently held the name giving ceremony of *Windlift1* that will be launched later this month, constructed for Bard Engineering GmbH it is said to be the biggest project that it has had to date.

Windlift1 a heavy-lift, self propelled platform vessel, will be capable of transporting and elevating heavy and oversized cargo. The vessel will be employed for construction and maintenance at the Bard offshore wind farm that will be in position 100km from mainland Germany, with the farm covering an area of 860km². *Windlift1* will mount and install 80 Bard turbines at the site, which will produce 400MW of power to the mainland.

Windlift1 will be used to carry the foundation assembly equipment of the wind turbines, and will also be equipped with a template to install a transition piece and foundation piles at the site of the wind farm. Three foundation piles will be bought out to *Windlift1* by pontoon. The piles and the transition piece will be lifted by *Windlift1's* main crane on to its deck. During the operation *Windlift1* will support itself on its four legs in jack-up position with the deck elevated to 10m above water level. *Windlift1* will be capable of operating in water depths of up to 40m.

The challenge of constructing the massive heavy-lift vessel came when the two sections of hull, each weighing 2300tonnes were joined together in February this year. This was carried out in WSY's waterways and assembled both on the water and underwater.

After coupling the hulls, a 300tonne lifting capacity floating crane was used in mounting the ships superstructure and fitting the supporting structures (legs) on to *Windlift1*; F6090 QL-class steel supports were used for production of the legs due to its strength. Four legs, each weighing 350tonnes and 71m in length have been fitted to *Windlift1*, taking two

***Windlift1* the largest project WSY has so far.**

Bridge layout on *Windlift1*.

TECHNICAL PARTICULARS

Windlift1

Length o,a	101.80m
Breadth	36m
Draft	3.5m
Water depth for jacking up	45m
Payload	approx. 2600tonnes
Accommodation	50 persons

Main Crane

Height above deck	121m
Capacity	500tonnes@31m

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weeks to install. At the same time of fitting the legs to the vessel, a 500tonnes lifting capacity crane was hoisted and mounted on to *Windlift1*.

Windlift1 is 101.80m length overall with a breadth of 36m and draft of 3.5m. The vessel will have four Wärtsilä 9L20 diesel generators with a capacity of 1665kW, along with an azimuthing propeller and 32 leg lifting hydrocylinders. It is equipped with a 103m crane with a lifting capacity of 500tonnes and a 19.5m helicopter landing site.

Arnoldas Šileika, general director, Western Shipyard said: "The construction of the unique, technologically sophisticated, special-purpose ship *Windlift1* – was a major and serious challenge for Western Shipyard. This Large scale project culminated in 10 years activity and experience within the shipbuilding segment."

WindLift1 was scheduled for delivery in August and will start working on the Bard offshore wind farm in the near future. *NA*

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Hoebiger releases explosion valves

Hoebiger the compression technology company has launched its latest explosion release valves for dual-fuel and gas engines.

Hoebiger has developed a range of explosion relief valves series EVT and EVM, which will offer protection to the engine as well as the workforce should an explosion occur in a duel-fuel or gas engine.

The EVT valve type has been designed to handle high pressure ranges and is equipped with disk springs and is used in the intake manifolds and exhaust lines of the engine. Where as, the EVM type valve are applied for low pressure ranges and is fitted with multiple coil springs, that are installed in the exhaust gas lines duel-fuel and gas engines and the down stream piping systems.

The Hoebiger explosion relief valves are designed to perform in giving an even discharge and distribution of heat that arises after an explosion has happened. The valves require hardly any maintenance and are also reusable after an explosion.

Hoebiger launches latest explosion valve range.

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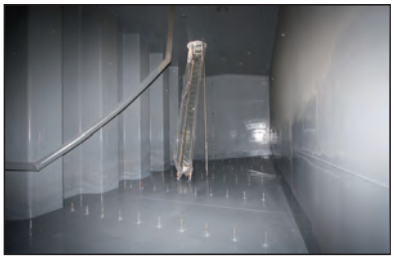

The marine environment has always been a harsh and unforgiving environment for both anti-fouling and corrosion control coatings systems. In the current economic climate the industry faces an even greater need to improve the performance and cost effectiveness of coatings systems. The industry is now being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

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

Both from a financial and environmental point of view the need for a clean hull, reduced resistance and hence reduced fuel consumption have never been more important. Many operators including the offshore energy sector are seeking coating systems with greater surface tolerant and extended life to 15, 20 or even 40 years.

This conference will provide a forum for materials manufactures, shipbuilders, repair yards, contractor's operators and owners, coating manufacturers, and classification societies. Papers are invited on all related topics including the following:

- Performance standards for protective coatings
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- Maintenance and repair of coating systems
- Vessel lay up procedures and issues for coatings
- Coating system development & challenges
- Environmental issues: anti-fouling, solvent emissions, etc.
- Coating data measurements and recording
- Anti-fouling performance monitoring and analysis
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Fassmer lands contract for green warrior

All the green paraphenalia will be in evidence on the latest Greenpeace flagship due to be delivered in 2011.

Rainbow Warrior III is the first commissioned purpose-built vessel for Greenpeace; as opposed to previous *Rainbow Warrior's* that have been refurbished vessels. Although in the current economic climate Greenpeace is taking a brave step by commissioning a newbuild. Gerd Leipold, executive director, Greenpeace said: "Greenpeace is demanding that politicians and individuals alike to make policy and investment decisions based upon environmental imperatives. Just as this is not the time to short change future generations."

Naval Architects Gerard Dijkstra & Partners in Amsterdam, The Netherlands was commissoned to design the next-generation *Rainbow Warrior*, with Fassmer in Germany to construct the vessel. Construction of the vessel is due to start in 2010, with the delivery of the *Rainbow Warrior III* in 2011, in time for Greenpeace's 40th anniversary.

The hull shape has been designed specifically to give superior energy efficiency. The A-frame mast and sails will give optimised highly effective sailing, as the vessel will mainly sail. Only in bad weather conditions will it then switch over to its 300kW electric drive system, which will give the vessel a speed of 10knots. The vessel will be 57.92m length overall and a beam of 11.30m.

Rainbow Warrior III will have green ship class notation with a green passport. Adding to the environmental efficiency of the vessel it will also have the facility for the treatment of biological sewage and grey water, along with central filling and venting system for fuel and oils to prevent spills, environmentally friendly paint system and will also recycle engine heat to produce hot water for the crew. *NA*

TECHNICAL PARTICULARS	
Rainbow Warrior III	
Length, o,a	57.92m
Beam	11,30m
Design draught	5,00m
Air draught	50,50m
Tonnage	838gt

Rainbow Warrior III the next-generation flagship for Greenpeace.

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Retro MAN offers new efficiency investment plan

In delivering a package of retro-fitted engine devices MAN Diesel recognises that its customers may experience difficulty in finding the credit to make the changes. So a deal with Danish bank Nordea has put the Trident financial package on the market.

Cutting the use of fuel means more efficient running and fewer harmful SO_x, NO_x and CO_2, but investing in the expensive add ons to a vessel's engine can prove prohibitive.

The Germany-based company has made a deal to offer a package of energy efficiency devices for their engines through a buy now pay later scheme. The package includes the Alpha Lubricator, which MAN says will reduce "oil-feed rates by 20-30%": A blending onboard system will allow chief engineers to blend additives to system oil for use as cylinder oil and lastly a turbocharger cut out will improve engine performance during low-load operations.

The package is repaid over four six monthly instalments with a competitive 4% interest rate but there is nothing to pay for the first six months.

MAN Diesel said that installation of the turbocharger cut-out system requires little time and with careful planning it can take place during voyages by the company's installation team.

According to MAN Diesel engines with three turbochargers, one turbocharger cut-out enables operation at loads from 20% to 66% MCR, delivering:

- an expected SFOC reduction of 5g/kWh and a 0.25 bar increase in scavenge-air pressure at 25% power
- an expected SFOC reduction of 3g/kWh and a 0.52 bar increase in scavenge air pressure at 50% power
- turbine-out temperature drops of up to 30°.

Engines with four turbochargers and one turbocharger cut-out enables operation at loads from 20% to 74% MCR, delivering:

- an SFOC reduction of 6g/kWh per 0.15 bar increase in scavenge-air pressure at 25% power
- an SFOC reduction of 5g/kWh per 0.41 bar increase in scavenge-air pressure at 50% power
- turbine-out temperature drop of up to 50°.

For engines with less than three turbochargers, MAN Diesel recommends a solution with variable turbine inlets. *NA*

HSVA develops v-SHALLO

German-Based HSVA has the updated its programme v-SHALLO that now features added wave resistance coding.

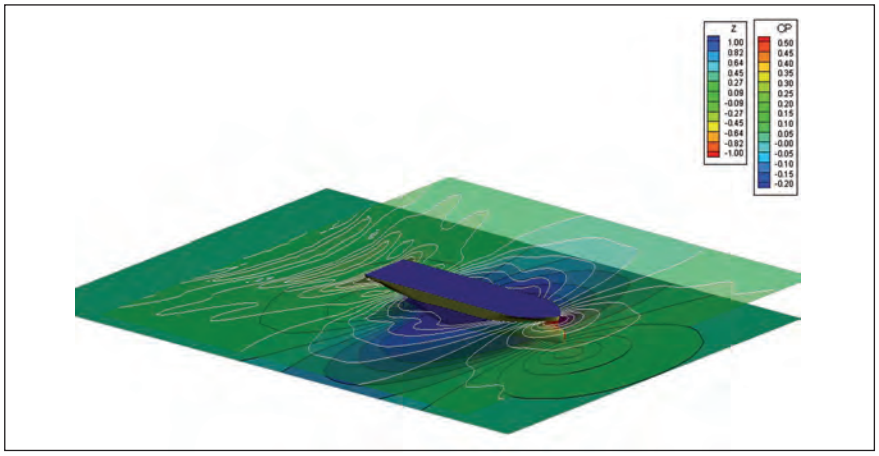
The latest release of v-SHALLO features improved free surface meshing for multi-hulls and a largely improved graphical user interface (GUI), which boosts the efficiency of standard evaluations performed with the code. Adding to this is the recent addition of the VIP (virtual integration platform) developed in the EU VIRTUE project.

This latest update is a fully non-linear, free surface potential computational fluid dynamics (CFD) code computing the inviscid flow around a ship hull at a free surface. Typical code applications have a range of possible applications from standard monohulls to complicated multi-hull vessels.

Computing the inviscid flow around a ship hull at a free surface, v-SHALLO is fast, flexible and an ideal tool to analysis the effect of design variations. The code hence lends itself easily to use in a number of integrated optimisation environments in which it is applied, either in-house at HSVA or at customer sites.

The programme has been redeveloped using latest singularity as well as numerical techniques. Advanced programming concepts will make it "easy to use" and will be a window oriented application that will integrate smoothly in to a variety of design environments, say HSVA.

V-SHALLO is capable of computing a large number of different flow cases such as;



Wave elevation and pressure on sea floor for a small container ship on shallow water.

deep water condition, shallow water, monohulls / conventional ships, multi-hulls (catamarans, SWATH, trimarans, asymmetric ships (monohulls as well as catamarans), submarines, fixed models as well as free to trim and sink conditions.

The recent addition of the VIP combined use of fast and efficient CFD plus automated optimisation techniques give an opportunity to improve the wave resistance of a ship and reduce fuel consumption during operation.

V-SHALLO'S results comprise pressure distribution on the hull and the wave elevation around the ship. Integral results such as forces, trim and sinkage are also plotted during the computation. V-SHALLO has been written in FORTRAN 90 making use of a number of advanced concepts with versions available for MS-Windows 9x and NT operating systems as well as for LINUX. V-SHALLO presently supports panel input from different sources such as NAPA/npn and GiD.

The GUI has been developed using JAVA and is available for UNIX/LINUX as well as Microsoft Windows XX platforms. The GUI substantially facilitates users input and control of computations and will support; input generation, import of panel models from, different formats, control and modification of panel, models, visualisation and control of computational results. Alternative output re-presentation can be performed using Tecplot. *NA*

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Austal looks for fast trimaran buyer

A 39knot trimaran is under construction at the Henderson yard in Australia. It is the first of its type being built and Austal and the company believes the hull design is its greatest technological achievement to date.

While boosting its orderbook this year through contracts for two of the largest catamarans in the company's production range, Austal Ships has given added dimension to its construction programme and market offering by way of a new design of trimaran passenger/vehicle ferry. A purchaser is now being sought for the first example of the new class of 39knot, 102m trimaran, which is already taking shape at the Henderson yard in Western Australia, with completion scheduled for early 2010.

Incorporating a hoistable mezzanine deck to confer flexibility in carrying trucks and cars, the Auto Express 102 type is an evolution of Austal's landmark, 127m trimaran ferry *Benchijigua Express*, delivered in 2005 to Canary Islands operator Lineas Fred Olsen. *Benchijigua Express* was the world's first high-speed trimaran capable of transporting large numbers of passengers and vehicles across long, arduous ferry routes while affording high standards of seakeeping and comfort.

The shipbuilder believes that the development of the trimaran hull form ranks as perhaps the single greatest technological achievement in Austal's history. The design concept effectively decouples vessel length from capacity and permits the combination of a cost effective, revenue-earning platform with a longer hull form that offers superior seakeeping in a range of conditions.

An artist's impression of the aft section and cardeck of the Austal trimaran.

Through its utilisation of Austal's trimaran technology, the new, all-aluminium Auto Express 102 design combines the softer roll of monohulls with the low resistance, stability and carrying capacity of catamarans. The vessel offers a maximum deadweight of

The first trimaran under construction at the Henderson yard.

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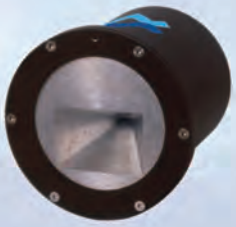

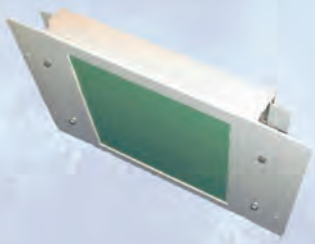

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High Speed Craft, an artist's impression of the Austal trimaran in service.

700tonne on a draught of 4.2m, and can be arranged for 1165 or 950 passengers.

The significantly lower metacentric height (GM) of a trimaran, considered to compare favourably with that of a conventional displacement monohull, produces a lower roll speed and, hence, lower roll accelerations. This translates into a reduced incidence of passenger seasickness. Moreover, the slender main hull of the trimaran is longer and finer than the hull of an equivalent, displacement monohull or the combined hulls of a catamaran, such that vertical motions are reduced. A ride control system also contributes to the performance in a seaway.

Vehicular access and egress is over the stern, and the ro-ro payload could comprise 190 lane-metres of trucks plus 145 cars, or an all-car intake of 245 units, or various permutations of goods vehicles, buses and cars. The clear height for trucks under the raised mezzanine deck is 4.3m, while the hoistable deck in its deployed position gives a headroom below of 2.3m for cars and a headroom above of 2.0m.

Potent German high-speed diesel machinery has been nominated by the shipbuilder, whereby three MTU engines of the 20V8000 M71L model each turn out 9100kW at 1150 rev/min. The 8000 series has figured in a number of Austal newbuild projects over recent years, and has consistently set the performance benchmarks for fuel efficiency, at less than 190g/kWh, while achieving International Maritime Organization (IMO) NOx emission certification.

In the Auto Express 102 trimaran, drive is through ZF 53800 gearboxes to three waterjets of Wartsila's LJX1300 type, allowing for schedules to be maintained at speeds of up to 39knots. The new addition to Austal's portfolio of ro-ro equipped, aluminium ferries has a range of 630 nautical miles.

Austal has confirmed orders so far this year for two major fast ferry contracts on the European market, both involving ro-ro equipped catamaran designs. Following the deal for a 113m newbuild signed with Nordic Ferry Services of Denmark, a 107m vessel was booked by Maltese operator Virtu Ferries. On scheduled delivery in 2011, the Danish ship will have the distinction of being the highest-capacity catamaran ever built by Austal.

Nordic Ferry Services, a joint venture between BornholmsTrafikken and the Clipper Group, intends to deploy its huge catamaran on the route linking Ronne, on the Danish island of Bornholm, and the southeast Swedish port of Ystad. Laid out for 1400 passengers and 357 cars, and offering a maximum deadweight of 1000tonnes, the 40knot vessel promises an improved transportation service to Bornholm residents, while also meeting seasonal demand generated by holiday makers.

A drive-through configuration, using both bow and stern ramps, has been adopted for the new design, which embodies three car decks. Its passenger and vehicle payload exceeds that of the 127m trimaran *Benchijigua Express*, as it does also that of the 113m catamarans delivered to Hawaii Superferry last year, each with capacity for 866 passengers and 282 cars.

With Danish environmental regulations for fast ferries among the most stringent worldwide, Austal's new 113m catamaran is required to comply with legislation covering environmental noise, wave-wash and exhaust emissions.

The 107m catamaran ordered by Virtu Ferries for operation between Malta and Italy is to be handed over in mid 2010, and has been designed to convey 800 passengers and 230 cars at a speed of approximately 39knots. ***NA***


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Vigo ro-pax ferry highlights Spain's capabilities

A testament to the breadth of Spanish capabilities in the field of ro-ro ferry design, construction and operation, the 24760gt *Martin i Soler* signifies the opening delivery in a major fleet investment programme covering the route network linking the mainland with the Balearic Islands.

As the first of four non-identical newbuilds ordered from Galician shipbuilder Hijos de J.Barreras by Eurolineas for operating company Balearia, the compact, stylish vessel denotes the unfolding of a strategy to reinvigorate and strengthen capacity and service in the hotly-competitive Balearic traffic.

The 22knot *Martin i Soler* is cast in the ro-pax mould, having been dimensioned for 1200 passengers and a freight intake equating to 1720 lane-metres. Although fast ferries figure prominently in the Balearia fleet, the newbuild quartet champions the belief that the business future for the recipient services lies in vessels of conventional form offering ro-ro payload flexibility and scheduling dependability, together with high onboard standards. Objectives as regards the latter are expressed in the considerable attention that has been paid to the interior design and to factors influencing passenger comfort.

Martin i Soler, first of four Balereric sisters designed to suit route operations.

The tranche of four vessels booked from the Barreras yard at Vigo amounts to a total contractual value in the region of €350million, and has added technical as well as commercial significance for the fact that the project has tailored newbuild ro-pax tonnage to the needs of trade to the four main islands of the Balearic archipelago. *Martin i Soler* is suited to operations into smaller harbours on the islands of Menorca and Ibiza, as well as to mainland ports including Denia, at the southern end of the Gulf of Valencia.

The three subsequent ferries in the series include one vessel which will be larger than the *Martin i Soler*, at 190m overall by 26m breadth, while employing the same main and auxiliary machinery as the lead ship. Another of the series embodies a modified, smaller design within hull measurements of 154m overall, 137m lbp (length between perpendiculars) and 24.2m width, while one of the ferries is intended to suit links between the mainland and Formentera, the smallest of the four principal islands, dictating a length overall of some 100m, a length between perpendicular (lbp) of 86.6m and breadth of 17m.

Very much a Barreras-built ship in her bearing and demeanour, *Martin i Soler* has main dimensions of 165.3m overall, 152.5m between perpendiculars, and 25.6m breadth. Her three cargo decks plus hoistable car deck provide for a range of load permutations including 1200 lane-metres for trucks and trailers plus 328 cars, or 1720 lane-metres of goods vehicles and 107 cars.

The versatility offered in terms of the ro-ro manifest suits both the year-round transportation requirements and seasonal tourist traffic of island routes. The comparatively high cargo potential of the design, given the ship's modest size, is evident from the 900 lane-metres of freight

TECHNICAL PARTICULARS

Martin i Soler

Length oa	165.30m
Length bp	152.50m
Breadth, moulded	25.60m
Depth, to main deck	8.50m
Depth, to upper deck	13.80m
Draught, design	5.50m
Draught, full cargo	5.70m
Corresponding dwt	4370dwt
Draught, scantling	6.00m
Passenger capacity	1200
Ro-ro capacity	1720 lane-m plus 107 cars
Main engines	2 x 9000kW
Propulsion power	18,000kW
Speed	21.4knots
Class	Bureau Veritas

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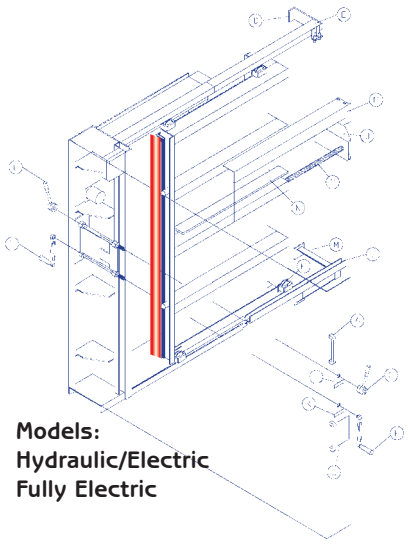

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that can be taken on the upper deck, plus 820 lane-metres on the main deck.

Martin i Soler incorporates a drive-through configuration, by means of double-level access at the bow and two stern door/ramps. However, the vessel's garage space arrangement also allows ro-ro handling to be concentrated through the stern. The suite of ro-ro equipment was designed and supplied by MacGregor. The bow ramp on the threshold deck unfolds behind side-swinging doors, and a top-hinged door at the front of the superstructure opens the upper vehicle deck to direct movements on and off the ship by way of a shore ramp landed on the forwardmost, open area of the deck.

The stern access layout features two folding ramp/doors connecting immediately with fixed ramps giving access to the upper deck as well as the main deck. This permits dedicated inward and outward flows to and from the two ro-ro levels. Flexibility in terms of loading vehicles through the bow or stern ramps is also conferred by the use of a hoistable tilting ramp for transfers between the space-restricted, two lower car decks and the main deck.

Notwithstanding the core importance of freight, the staple of the year-round island traffic, in shaping Balearia's new ferry, the vessel has won wide commendation for the quality and nature of her passenger spaces, placing her in a different league to many ro-pax ships. Much of this reflects the input of the Spanish company Oliver Design. The interiors feature innovative, double-height public spaces forward, aft and amidships, with curved, open staircases in the forward and aft lounges and the main lobby, and including steeply raked, panoramic windows forward.

Passenger access comprises a total of four escalators, and passenger entry is by way of large side shell doors located some way forward of the stern, ensuring complete separation from the vehicular traffic flow lines. Catering for a maximum 1200 passengers, the ship has a degree of cabin accommodation, largely in the form of 40 four-berth family cabins on Deck 8.

Martin i Soler is powered by a pair of MaK 9M43C main engines of 9000kW apiece, driving two Kamewa high-skew, controllable pitch propellers through Reintjes reduction gears for a service speed of 21.4knots.

Overall power system efficiency is enhanced by using 1300kVA shaft alternators, driven by power take-offs from the gears, to provide electrical energy when the ship is under way. The auxiliary power arrangements are otherwise based on three diesel gensets of some 1140kW apiece.

To meet demanding criteria for manoeuvrability, especially as regards operations to the smaller Balearic harbours, the ferry is equipped with two 1000kW, electrically-driven bow thrusters from the Rolls-Royce group. A pair of Rolls-Royce retractable stabilisers of the Aquarius 100-type, with a fin area of 5.35m^2, have been fitted in the interests of vessel stability and passenger comfort in all conditions. *NA*

Stern load ramp arrangement on *Martin i Soler.*

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P&O innovation applied to newbuilds

The new generation of P&O vessels on the Dover to Calais route will be innovative designs that will meet Safe to Return To Port (SRTP) regulations.

In March this year, steel cutting began in Finland for the first of P&O Ferries' two 49,000gt ro-pax newbuilds, which will have the distinction of being the first passenger-carrying ferries worldwide to comply with International Maritime Organization (IMO) Safe Return to Port (SRTP) requirements. These edicts are due to enter force on 1 July 2010, and embrace performance standards for a wide range of shipboard systems and services in the aftermath of an emergency, including fire fighting, electrical power supply, navigation, and communications, as well as propulsion power and steering.

Each vessel is being built and equipped to meet Lloyd's Register's PSMR (Propulsion and Steering Machinery Redundancy) notation. The arrangements and provisions encompassed by the notation are intended to ensure that, in the event of equipment failure, the ship retains availability of propulsion power and manoeuvring capability to enable a safe return to port.

IMO's SRTP rules, which follow new subdivision requirements based on probabilistic calculations, seek to ensure that a passenger ship can safely make port with any single compartment put out of action or destroyed by fire or water ingress. The legislative development has a fundamental impact on ro-pax design, since it effectively precludes the concentration of all main machinery in one room.

The rules will be applicable to all passenger vessels with capacity for at least 36 passengers and laid down from 1 July 2010 onwards, having a length of 120m or more, or incorporating three or more main, vertical fire zones. P&O has therefore taken a proactive line in building to the requirements ahead of the mandatory date.

The propulsion and powering systems specified for the two newbuilds account for more than €35million of the total cost of the project, and P&O's endorsement of common rail fuel injection technology underscores its predilection for innovation in application to ferry design, engineering and operation. The equipment distribution and associated configuration of the machinery spaces allies with the change in the ro-pax design regime fostered by the latest regulatory initiatives.

By selecting MAN 48/60CR medium-speed propulsion machinery, the company anticipates benefits in terms of operational performance, flexibility and fuel consumption over the ships' complete service profile. Furthermore, by stipulating the Tier II version of the engine design, it has also anticipated IMO's tougher emission controls from 2011 onwards.

Each ship will be installed with four seven-cylinder 48/60CR main engines, each yielding 7600kW at 500 rev/min, driving two controllable pitch propellers through twin input/single output reduction gears, for a total propulsive effect of 30,400kW. The genset plant has also been sourced from MAN, whereby each shipset is based on four 7L21/31 engines delivering 1463kW apiece at 1000 rev/min. Having entrusted complete 'packages' to MAN, not only will the engines be constructed at the headquarter Augsburg works, but the gears will come from subsidiary Renk's Augsburg factory, while the propellers will be manufactured at the Frederikshavn plant in Denmark.

Besides improved emission credentials, the overall fuel savings promised by the chosen systems have special importance in the light of the fuel price volatility experienced by the industry in recent times. In parallel with the investment in substantial and 'cleaner' power, the hull lines have been determined to raise hydrodynamic efficiency and thereby optimise the vessel performance and fuel consumption relationship.

P&O's new breed of ro-pax has two main engine rooms, each accommodating a pair of propulsion engines and two gensets, and arranged in staggered, adjoining fashion, with one forward and one aft. The layout in each is a mirror image of the other. The split arrangement also applies to other key equipment, including the steering gear, switchboards, fuel treatment and transfer systems.

Although the overall length of the design, at 210m, is only slightly more than that of the largest vessel used so far on the Dover/Calais run, the commercial ro-ro intake embodied in the newbuild class signifies a major advance over earlier ships. Through the provision for more than 180 freight vehicles, the new ferries will offer around twice the freight capacity of the ships being superseded, the 1987-built sisters *Pride of Dover* and *Pride of Calais*.

In addition to 2700 lane-metres for trucks, up to 195 cars will be accommodated on a third deck in the garage spaces. The ro-ro arrangements will be complemented by facilities for 2000 passengers. The high truck component in the payload expresses P&O's strategic aim of catering for business growth in the freight market. Shipbuilding contractor STX Europe is due deliver the vessels in December 2010 and September 2011 from the Rauma yard in western Finland.

The cargo access outfit has been designed by supplier MacGregor to meet the challenges of ensuring expeditious and efficient turnrounds on each side of the Channel, in keeping with onerous scheduling demands and the increased ro-ro capacity encapsulated by the ships. A drive-through configuration has accordingly been adopted, as has double-deck handling.

Opening to the main deck, the bow door will be of two-section, hydraulically-driven design, with each leaf opening outwards, and will be operated from a control panel aft of the inner bow door. The watertight, side-hinged inner bow door will be located inboard of the collision bulkhead area. For direct access to the upper ro-ro level, each vessel will incorporate a top-hinged, upper front door, and a horizontal sliding door, located on deck 3. Inter-deck access equipment will include a trailer lift for goods vehicle transfers between the main deck and lower hold.

Rapid turnround and scheduling demands reflected in the design encompass not only the ro-ro layout and access arrangements but also ship handling characteristics, including an ability to manoeuvre under own power in 50knot winds and the use of existing berths rather than needing new facilities. *NA*

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LNG powered ro-ro design aimed at European market

South Korean shipbuilder, Samsung Heavy Industries, is drawing up plans for a LNG powered ferry to meet environmental demands expected to be made of the maritime industry.

Anticipated economic benefits together with the environmental advantages associated with the use of liquefied natural gas (LNG) as fuel have led Samsung Heavy Industries to develop a design proposal for a ro-pax ferry incorporating a gas-fuelled propulsion system. The initiative is aimed squarely at the European market, where there is now growing usage and interest in the adoption of LNG-based plant for coastal and shortsea vessels, supported in some areas by investments and commitments to the requisite fuel supply infrastructure.

The Samsung ro-pax technical project also reflects consideration of the trading trends and fleet development tendencies of recent years, whereby the accent in design has been on increased freight capacity, productivity and transportation efficiency per cargo unit. The ro-ro payload intake corresponds to 4700 lane-metres. The Korean yard said that the design has main dimensions of 225m length by 31m width, and that she would "sail at 40km/h with 300 trailers", indicating a service speed capability of at least 25knots.

Compared with conventional powering arrangements based on the use of oil, LNG fuelling offers the potential to drastically reduce oxides of nitrogen (NO_x), curb carbon dioxide (CO_2) emissions, and virtually eliminate oxides of sulphur (SO_x). However, while LNG would be the main fuel, the plant proposed for the Samsung ro-pax would also permit diesel oil to be used as an alternative.

Samsung's expectation is that operation on LNG would cut NO_x emissions by 90%, potentially taking levels below the limit foreseen by International Maritime Organization (IMO) for designated NO_x emission control areas (NECAs) from 2016 onwards. The freedom from SO_x is also relevant to IMO's tough new requirements due to enter force in 2015 for SO_x emission control areas (SECAs). Furthermore, a reduction of 20%-plus in CO_2 is also anticipated in relation to a conventional diesel engine solution, promising clear environmental benefits while also helping to 'future-proof' the design against the backcloth of controversial new regulatory proposals relating to greenhouse gas emissions.

It is understood that the ro-pax would incorporate four dual-fuel engine-driven gensets delivering electrical energy to two 11MW propulsion motors turning twin propellers. How the LNG storage tank arrangements will influence the vessel's configuration and ro-ro capacity, relative to conventionally-fuelled ferries, has yet to be detailed.

Over-and-above the pivotal use of LNG, a comprehensive approach is being taken in the design to issues relating to efficiency and environmental effect, as illustrated by the planned installation of a waste heat recovery system. Samsung claims that the proposed new class offers energy efficiency gains of an order that would bring operating costs down by as much as 38% in relation to more conventional solutions.

"We developed the eco-friendly passenger vessel to comply with the IMO standards for pollutant emissions that will take effect in 2015," confirmed Samsung Heavy Industries' vice chairman and CEO Kim Jing-wan. "We are working on diverse eco-friendly technologies that will give us an edge with European businesses, as part of our plan to enter the cruiseship market," he added. The unveiling of the LNG-fuelled ro-pax design followed two years' research and development work. *NA*

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NAVY

Optima probes ro-ro market with new ferry designs

The development of the Fosen Optima design is aimed at freight ferry customers. The new vessels will develop the experience gained from the Stena Seabridger class ferry designs.

Norwegian shipbuilder Bergen Group Fosen, successor to Fosen Mek Verksteder, is seeking to secure fresh business in the ro-ro domain on a competitive footing by launching a series of designs with a common root and concept. Representing the further development of the Fosen Optima design, and dubbed the Optima Model Line 2009, the offering of ro-pax and ro-ro freight vessel variants encapsulates a flexible, optimised design approach with the accent on efficiency as regards both capacity and fuel consumption.

The Fosen Optima family builds upon a successful class of 3100 lane-metre, freight-orientated vessel first delivered to Stena Ro-Ro three years ago for North Sea service with Stena Line. The *Stena Trader*, followed by the *Stena Transporter*, gave a substantial boost to capacity and productivity on the operator's link between the Hook of Holland and Killingholme, on south Humberside.

The two ships were designated the Seabridger class by Stena, and combined a three-deck layout for 3100 lane-metres of trucks, trailers and other vehicles and units with accommodation for 300 drivers and passengers. To secure the requisite loading capacity and operating efficiency, Stena RoRo opted for a long, relatively lean hull, at a length overall of 212m and breadth of 26.7m. Some 21,600kW of propulsive power in conjunction with the hydrodynamically efficient hull gives an operating speed of 22knots.

Bergen Group Fosen's in-house engineering department has developed the Fosen Optima brand for ro-ro and ro-pax applications covering freight capacities in the range of 2900-4020 lane-metres, with passenger intakes of up to 850, potentially including as many as 200 cabins.

The ro-pax variants range between 200m and 212m in length overall, at 26.7m moulded breadth, and the deadweight band from 7500tonnes to 8250tonnes. In the flexible design concept applied by the Norwegian company, ro-ro payload can be adjusted through the adoption of either three or four cargo decks and by different sizing of the accommodation spaces and superstructure, within fairly constant main dimensions. One of the benefits of the Optima concept is that it offers a variety of design options using proven structural elements that can be rapidly and cost-effectively incorporated in accordance with the customer's particular needs.

Powering options for the twin-engined design series range from individual engine powers of 8400kW to 13,000kW, depending on load and speed requirements and combinations, for the speed band between 20 and 24knots.

Stena Trader and *Stena Transporter* are each fitted with two MAN B&W 9L48/60B diesels, producing 10,800kW apiece. The two ships work all cargo over the stern, although the design was developed to facilitate bow access at both main and upper decks. Furthermore, it was envisaged from the start that jumboisation could be achievable at some future stage by incorporating an additional freight deck aft of the accommodation, a possibility which is indicative of the potential realised in various offerings under the Fosen Optima title. *NA*

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Norman Arrow hits highspeed ferry mark

Operating to a higher standard than previous high-speed craft sailing on cross-Channel routes *Norman Arrow* offers significant freight facilities and greater passenger comfort.

Giving a new dimension to the Strait of Dover near-sea traffic, the 112m wave piercing catamaran *Norman Arrow* marks an investment in a high-speed capability offering significant capacity for freight. The project melds the business verve of LD Lines, part of the Louis Dreyfus Group of France, with Incat's technological and constructional know-how in the large, fast ferry domain.

Relative to earlier-generation high-speed ferries used on the Channel, the latest entrant to the trade is claimed to encapsulate a substantial advance in seakeeping qualities and passenger comfort, vital operational and commercial attributes for year-round duties, as well as enabling a meaningful volume of freight to be transported at speeds well in excess of the area's conventional ro-pax ships.

Norman Arrow is the third of Incat's Evolution 112-class catamarans, and combines a light structural weight, wave piercing hulls, shallow draught and considerable power concentration in such a way as to give speeds potentially in excess of 40knots.

Norman Arrow is an alternative to the conventional ferries operating out of Dover, reducing transit time to France by nearly a half.

It has been laid out for 1200 passengers and crew and 567 lane-metres of goods vehicles plus 195 cars on a separate car deck. Alternatively, the garage spaces provide for an all-car intake of 417 units, and it is understood that a service speed of some 39knots would be attainable with such a load on a draught of 3.93m. Significantly, the arrangements allow for up to 28 trucks to be conveyed on each sailing, constituting a notable hike in high-speed freight transport possibilities on one of the world's busiest short-sea or near-sea corridors.

Norman Arrow was phased into service on the Dover/Bolougne crossing just a matter of months after LD Lines entered the route. The introduction of the fast ferry has boosted service frequency from two to six sailings per day, providing a one-hour crossing time for travellers and hauliers as an alternative to the one and three-quarter hour transit by conventional ferry.

While the two previous examples of the 112m wavepiercer class were delivered to a northern Japanese operator, the latest embodiment of the design was conceived with the European market in mind. The buyer, Irish-based leasing firm MGC Chartering, has bareboat-chartered the vessel to LD Lines on a long-term basis.

The third 112m wave piercing vessel from the Tasmanian yard has been completed with a range of enhancements derived from her two Japanese predecessors, *Natchan Rera* and *Natchan World*.

One of the most notable differences is the internal ramp system on the latest catamaran's two vehicle decks. Whereas the full length, tier 2 upper vehicle deck on the first two 112m ferries was reached via an internal ramp on tier 1, the *Norman Arrow* employs a different

TECHNICAL PARTICULARS

Norman Arrow

Length, oa	112.60m
Length, waterline	105.60m
Beam, moulded	30.50m
Draught	3.93m
Gross tonnage	approx 11,000gt
Ro-ro capacity	567 lane-metres plus 195 cars
All-car capacity	417
Freight vehicles	28-30
Complement (passengers and crew)	1200
Main engines	4 x 9000kW
Propulsion power	36,000kW
Speed	approx 40knots
Class	Det Norske Veritas

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arrangement whereby the main deck is left entirely clear of obstructions for high-sided vehicles. Cars access Tier 2 by way of a ramp system around the forward end of the ship at the threshold level, and load in a clockwise direction, turning right to traverse across the bow area and end facing aft on the starboard side of Tier 2.

The modification to the internal access configuration has served to raise vehicle deck capacity to 567 lane-metres of freight at 4.60m clear height plus 195 cars at 4.5m length, compared with the 450 lane-metres of freight at 4.35m clear height and 193 cars at 4.5m length in the two preceding vessels. Were the garage spaces to be given over entirely to cars, the latest catamaran would be able to load 417, relative to 355 cars all-up in the earlier ships.

Incat conducted alongside tests of the latest vessel's freight loading and handling capabilities when it was still at the yard. A total of 28 trucks of three types, two of which conformed to the European length of 16.5m, were driven on and off the 30.5m beam ferry, without the need for any reversing while onboard. Handling and turning were evidently accomplished in a manner suited to the requirements of the near-sea traffic, despite the rows of pillars and cross bracing incorporated on the main deck.

As in the *Natchan Rera* and *Natchan World*, *Norman Arrow* is powered by four 20-cylinder MAN V28/33D main engines, each with an output of 9000kW at 1000rev/min. Although originating from the Ruston stable in the UK as the RK280, the engine type has been taken forward by the German group and is now produced at the Augsburg factory in Germany. A pair of engines and ZF gearboxes are located in each of the wave piercer's hulls, and the prime movers are all resiliently-mounted.

Although at the top end of the German maker's range, the ZF60000 NR2H transmissions are very compact, and embody a reduction ratio suited for optimum waterjet shaft speed in the four-waterjet installation. Each gearbox drives a Wartsila LJX waterjet, where engine power is converted into propulsion thrust. Relative to other, comparable waterjet propulsors, the LJX design is claimed to give a 10% overall weight reduction, while the use of Centa carbon-fibre shafts has also realised a substantial weight saving in relation to a conventional steel shaft solution.

Passenger comfort and vehicular security are vital considerations given the difficult weather conditions that can be experienced when operating around-the-year in the eastern Channel. One of the attributes of the 112m wave piercing catamaran is the generic type's good seakeeping qualities, enhanced by the Maritime Dynamics/Incat ride control system. Transom-mounted trim tabs are automatically controlled by the system, effectively reducing roll motions. The arrangements also provide for subsequent fitting of a retractable T-foil on the main hull, should operational requirements change.

The increased length of the catamaran hulls, together with other aspects of the Incat wave piercer hull form, and in conjunction with the ride control arrangements, promise reduced pitch, roll and heave, and consequently reduced motion sickness incidence and passenger discomfort in higher sea states.

Incat's portfolio of designs already takes the concept further, with a proposal for a 124.6m wave piercing catamaran, offering a maximum deadweight of 2000tonnes. ***NA***

Odense delivers first in freight ro-ro series

A.P.Moeller Maersk's yard takes time out from building containerships to deliver a series of freight ferries.

Representing a new departure for a shipyard hitherto most closely identified with large containerships and tankers for parent A.P.Moller-Maersk group, Odense Staalskibsvaerft has handed over the first in a long series of ro-ro freight vessels based on German blueprints. *Maas Viking* has been dimensioned for 3700 lane-metres of vehicles, corresponding to a trailer intake of 254 units.

She leads eight such vessels ordered from the Lindo yard by Epic Shipping (UK) and Pacific Basin Shipping, and has entered North Sea service between Netherlands and Britain under long-term charter to Norfolkline, part of the A.P.Moller-Maersk organisation.

The design on which the 29,000gt *Maas Viking* is based emanates from prolific ro-ro builder Flensburger Schiffbau Gesellschaft (FSG) of Germany, and is proven in European shortsea trade. The four-deck vessel has an overall length of 193.3m and a breadth of 26m, and her high payload intake as regards both deadweight and freight units has considerably increased capacity and productivity relative to supplanted tonnage on the route linking Rotterdam-Vlaardingen with Killingholme, on Humberside. Two powerful MaK medium-speed main diesel engines ensure a service speed of 21knots.

The cargo access equipment outfit supplied by TTS includes a full width stern ramp/door, leading directly to the main deck and the fixed ramp to the upper deck.

Epic's UK-flag *Maas Viking* is set to be followed on Norfolkline charter by second-of-class *Humber Viking*, the first of the Pacific Basin newbuilds. ***NA***

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Green machine to get updated design

Roadships' green machine design, the high-speed trailer carrier fuelled by LNG, is to be updated by STX Canada Marine. The designer's commitment to meeting environmental concerns was a factor in the company's choice of designer.

USA-listed Roadships Holdings has engaged North American technical consultancy STX Canada Marine, formerly Aker Yards Marine, to update the design of its Roadships high-speed monohull trailer carrier as an LNG-fuelled vessel.

An amendment to the commercialisation agreement contract between the USA firm and STX has given effect to the change. The move followed the confirmation of STX Canada Marine's parent company STX Europe of its commitment, by way of a new strategic plan, to helping to reduce the shipping industry's environmental impact.

The monohull ro-ro design project arises from Roadships' business model of shifting road freight to the seaborne mode. The aim has been to provide a fast, drop-trailer coastwise connection as part of an integrated logistics chain. Both government and the private sector have shown support for the initiative as a means of obviating and reducing traffic congestion on the USA east coast corridor, not least as regards interstate highway 95, increasing efficiency in door-to-door intermodal transport, and cutting emissions.

STX has this year been promoting its strategic environmental plan, Ecorizon, based on STX Europe's latest innovations and continuous research and development (R&D) endeavours. In addition to the belief that organisations such as itself have a responsibility to devise more eco-friendly solutions, the group perceives business opportunities in such an approach that potentially benefit client and contractor alike. "For our customers, the most attractive products and solutions are the ones that take into account environmental considerations," stated STX.

Ecorizon accordingly provides a structure for pursuing 'green' possibilities in ship design and manufacturing. It embraces every element influencing fuel consumption, emissions to both water and air, shipboard waste, and sustainability issues, with the guiding principle of taking the environment into account from the start of the ship design phase. In the context of the new thrust for a Roadships ro-ro using gas fuel, STX has a growing list of references with regard to LNG-fuelled vessels, including double-ended fjord ferries and offshore service vessels constructed at its Norwegian yards.

Above view of Roadships LNG trailer carrier.

Roadships America, a wholly owned subsidiary of Roadships holdings, in partnership with STX Canada Marine has been developing a high-speed ro-ro vessel for use in the USA and international coastal transport trade routes for some while.

Various types have been considered, and the pedigree for the high-speed monohull proposed for the Roadships America programme comes from a vessel concept that originated with Kvaerner Masa Yards Technology, now part of STX Europe. Conceived in the early 1990s for European shortsea applications, the high-speed design had used a hull form derived from a fast ro-pax ferry built at the Helsinki yard. The hull form was tested and improved over a five-year period, in an optimisation process to achieve minimum resistance and to allow the ship to maintain speed in conditions up to sea state 5.

Sustainable high speed has been one of the fundamental operating criteria in the Roadships project, which foresaw a multiple engine arrangement

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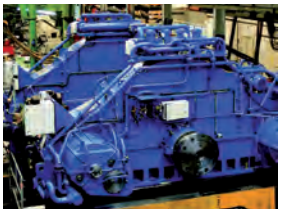

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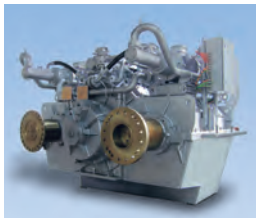

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Roadships LNG trailer carrier will increase transport efficiency.

to achieve the requisite 30knots service speed. The latest medium-speed diesel engine technology had been favoured over gas turbine propulsion for reasons of comparative fuel efficiency. Now, the new scenario calls for an LNG-fuelled propulsion solution.

Distinguished by a narrow, wavepiercing form, covered foredeck and inverted bow, culminating in a pronounced bulbous forefoot, the 200m fast monohull design as earlier proposed offered a 2430 lane-metre capacity, providing for the transport of 148 semi-trailers of 53ft at 30knots.

The cargo section had been designed to ensure maximum despatch capability, as the vital accompaniment to fast sea transits, with a configuration providing for direct load and discharge over the stern, and obviating the need for vehicles to have to turn within the ship. The freight payload would be accommodated on three decks, accessed across stern ramps fitted at both main and intermediate deck levels, facilitating simultaneous two-deck loading and discharge. *NA*

Daewoo makes further inroads into European ferry market

Attica Group orders two high-speed ro-pax vessels from South Korean yard to add to its fleet of three already built by Daewoo.

Renewed South Korean endeavours to build business in the European ferry market have borne fruit by way of Daewoo Shipbuilding & Marine Engineering's success in landing a contract from Greece for two ro-pax vessels. Distinguished by a comparatively high speed of 25.5knots, the pair has been contracted by Marfin Investment subsidiary Attica Group, whose fleet already includes three modern vessels constructed by Daewoo.

The latest newbuilds will be of 145.5m length overall, and are for operation in Greek domestic waters, carrying 2400 passengers and 450 cars, or alternatively up to 50 freight units plus 150 cars. The deal has commanded a price of €68.50million per ship, and calls for deliveries during the spring of 2011 and the opening quarter of 2012, respectively.

Attica is the parent company of Superfast Ferries and Blue Star Ferries, and the latter's development since the start of the decade has benefited from the commissioning of three Daewoo-built ro-pax vessels. These three ferries, *Blue Star Ithaki, Blue Star Paros,* and *Blue Star Naxos*, were recently described by Attica's chief executive officer Petros Vettas as the group's most successful vessels. The route network embraced by the group's overall fleet of 13 ferries covers the Dodecanese and Cyclades islands, the Greece/Italy traffic, and a service between Piraeus and Iraklion (Crete).

The contractual relationship between the Blue Star fleet and Daewoo saw the initial delivery in 2000 of the Blue Star Ithaki, a 24knot vessel of some 124m length overall by approximately 19m width, dimensioned for around 1300 passengers and 250 cars.

The 10,200gt *Blue Star Ithaki* was followed in 2002 by two further, similar newbuilds from the Okpo yard, in the shape of the sisters *Blue Star Paros* and *Blue Star Naxos*. The refined design employed for second and third ships offered speeds of 25 or 26knots, with a passenger intake of some 1450 and ro-ro space for 240 cars, or alternatively for up to 35 trucks and a reduced number of cars. *NA*

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Designers, classification societies and owners have faced the challenges posed by the introduction of the Common Structural Rules. Goal Based Standards have been developed further at IMO with the final elements expected to be finalised this year. Also at IMO, new schedules have been added to the IMSBC Code (formally BC Code) which will become mandatory in January 2011 and the BLU Code is currently under review to include grain and consider issues associated with high loading rates.

Environmental regulation is also moving forward with the revision to MARPOL Annex VI placing further restrictions on emissions of NOx and SOx. The development of the IMO Energy Efficiency Design Index is aimed at stimulating technical innovation in propulsive efficiency as the industry strives to reduce its CO_2 emissions.

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Freight ro-ro aimed at shortsea market

A versatile new design of ro-ro cargo vessel, branded the RoFlex type by Finnish contractual owner Bore, is scheduled to make its debut in the Baltic trade during 2011.

Bore's investment in sophisticated, pure freight-carrying ro-ro tonnage, still representing something of a niche market in the shortsea business, has been vindicated by long-term charter agreements secured with independent British operator Mann Lines.

Two RoFlex newbuilds, strengthened to Finnish/Swedish Ice Class 1A criteria, were booked from Flensburger Schiffbau-Gesellschaft(FSG), the German yard which has emerged over recent years among the top flight of ro-ro vessel designers and constructors worldwide. FSG has tailored the design to the customer's fundamental requirement to be able to efficiently and competitively cater to the broadest range of wheelborne freight and industrial cargo in the Baltic and north European traffic.

The bore RoFlex newbuild offers flexibility to operators who are working in an uncertain market.

The German yard's Con-Ro concept, which is well represented in its current orderbook, provided a technical basis for the RoFlex project. FSG's particular skills in hull hydrodynamic optimisation are clearly in evidence in the nascent Bore sisters. Initially, both ships will be timechartered to Mann Lines for a period of five years, although the deal carries options in each case for a follow-on five-year engagement.

Estraden and *Borden*, two Finnish ro-ros presently chartered by the UK firm, will probably be redelivered when the new ships are brought into Mann Lines' Baltic Sea services. The 13,500dwt newbuilds will signify a major advance in carrying capacity and also by any measure of efficiency, not least fuel consumption per cargo unit.

Within a length overall of 195.4m, the RoFlex offers a linear capacity of approximately 2900 freight lane metres, equating to some 217 mafi-type rolltrailers. The headroom availability on the ro-ro decks, up to 7.4m in the case of the main deck, will enable double-stacked containers on mafi-type rolltrailers to be carried throughout. Hoistable car decks incorporated at the main and lower hold levels offer a total car intake of 450, without penalising the scope for conventional ro-ro cargo or trailers, and thereby contribute substantially to the flexibility conferred by the design.

A single Wartsila medium-speed main machinery developing 12,000kW has been nominated for each of the new vessels, offering a service speed of 20knots on the design draught, although only 17.5knots will be needed to maintain the regular schedule on the ships' allotted route. *NA*

TECHNICAL PARTICULARS	
Bore RoFlex	
Length, oa	195.40m
Length, bp	186.22m
Breadth, moulded	26.20m
Depth, to main deck	9.65m
Depth, to upper deck	18.15m
Draught, design	7.05m
Corresponding dwt	approx 12,110dwt
Draught, scantling	7.40m
Corresponding dwt	approx 13,535dwt
Ro-ro laneage	approx 2863 lane-metres
Rolltrailer capacity	approx 217
Main engine power	12,000kW
Speed, at design draught	20knots

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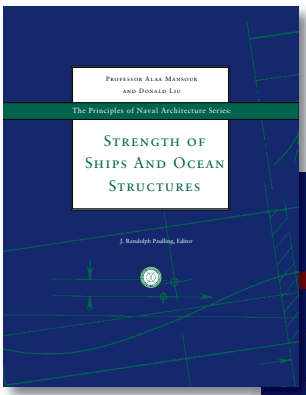

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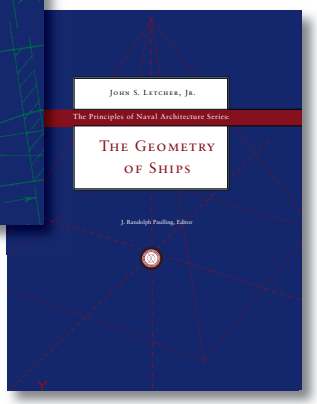

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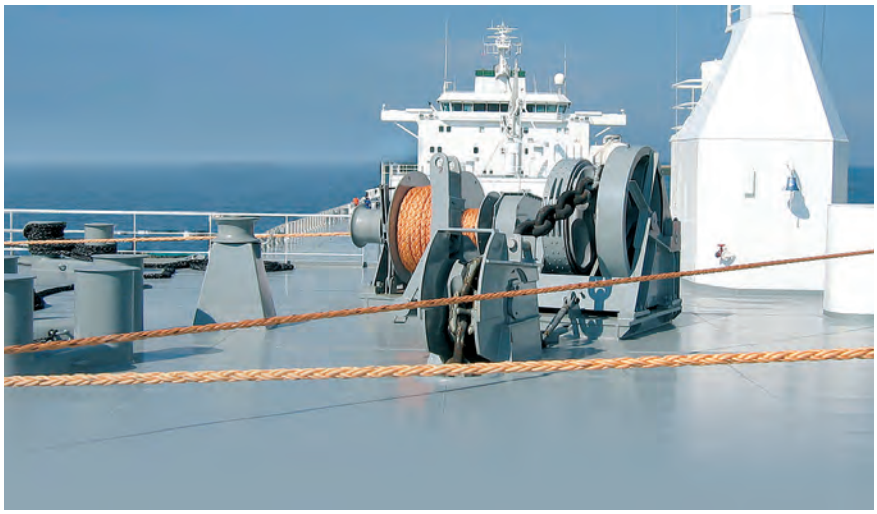
Efficiency is a standard at Aker Solutions

Standardisation of Aker Solutions' deck machinery has led to an expansion of its order book as customers are now offered a faster more efficient service.

Aker Solutions is stretching further with the development of its deck machinery with the implementation of its standardisation programme.

The programme is based on Aker Solutions winch design which will be modelled using a 3D design tool ProEngineer, which has now been used to compile a standard series consisting of approximately 70% fewer assembly groups.

As a result manufacturing drawings are easier to read and design errors will be reduced to a minimum, improving the overall quality. In addition, there will be more interface information on the general arrangement drawings ensuring correct installation of the equipment.



Deck equipment to be supplied to shipyards in China and Korea.

Changes have been made as a result of customer's requirements in recent years, class rules, OCMIF guidelines (oil/gas carriers) and ISO requirements, said Aker.

Lief Haukom, president, Aker Solutions said: "The standardisation of the process will improve delivery schedules, improve service for the clients and also the supply of spare parts."

Standardising approval documentation will in future mean that procurement and manufacturing will be able to commence immediately after receiving approval from the customer, should the customer accept and keep the standard options that are applied. All project drawings will be generated in 3D, allowing Aker Solutions to provide customers with 3D solids for direct insertion into the ships design tool.

"Using the standardisation programme we will be able to issue drawings quicker to the client and clients will be serviced quicker as they will be in the system," comments Mr Haukom.

To date anchor and mooring winches have been standardised. The same concept will be applied to cable lifter units, chain stoppers and hydraulic power units in the future.

Aker Solutions gradually introduced the new standardisation programme last year with latest contracts won by the company utilising the programme for the installation of deck equipment onboard vessels.

In addition to this latest programme Aker has been awarded three contracts from Hyundai Heavy Industries (HHI) in Korea and Dalian shipyard in China to supply deck machinery to 34 vessels. The total value of contracts is NOK100 million (US $16.2million). Aker Solutions will supply Pusnes electric deck machinery and Pusnes hydraulic deck machinery.

The contract from HHI consists of frequency controlled electric deck machinery for 4500TEU container carriers on order from a European shipowner. Aker has also secured another contract from HHI for the supply of deck machinery to 22,500 CBM LPG/NH3 carriers for the same owner. The equipment will be delivered in 2010 to 2012.

Two contracts from Dalian shipyard that consist of high-pressure Pusnes hydraulic deck machinery for 298,000dwt VLCC's and 76,000dwt petroleum carriers. The schedule for delivery is in 2010 to 2011.

"Aker Solutions is proud to win these contracts in a challenging newbuild market", said Mr Haukom. "The contract awards underline the confidence customers have in the quality of Aker Solutions' products combined with the worldwide lifecycle service network".

Development work has been carried out on the drives and the control winches of the Pusnes range of equipment making them more reliable and easier to maintain, and reducing the lifecycle costs of the equipment.

The redeveloped frequency controlled (FC) deck machinery uses the Aker Solutions patented Direct Torque Control (DTC) motor control platform, which will enhance all aspects of winch operation. The latest development of the DTC technology eliminates the need for an encoder for speed feedback.

Elimination of the encoder will significantly increased the reliability of the electric deck machinery as encoders have been susceptible to failure in the past, Aker Solutions said. With the DTC technology, anchor and mooring operations have been improved, allowing smoother auto-mooring operation without the use of load cell equipment.

DTC technology also utilises standard winch software, with all parameters being saved to the keypad. With this solution commissioning time will be significantly

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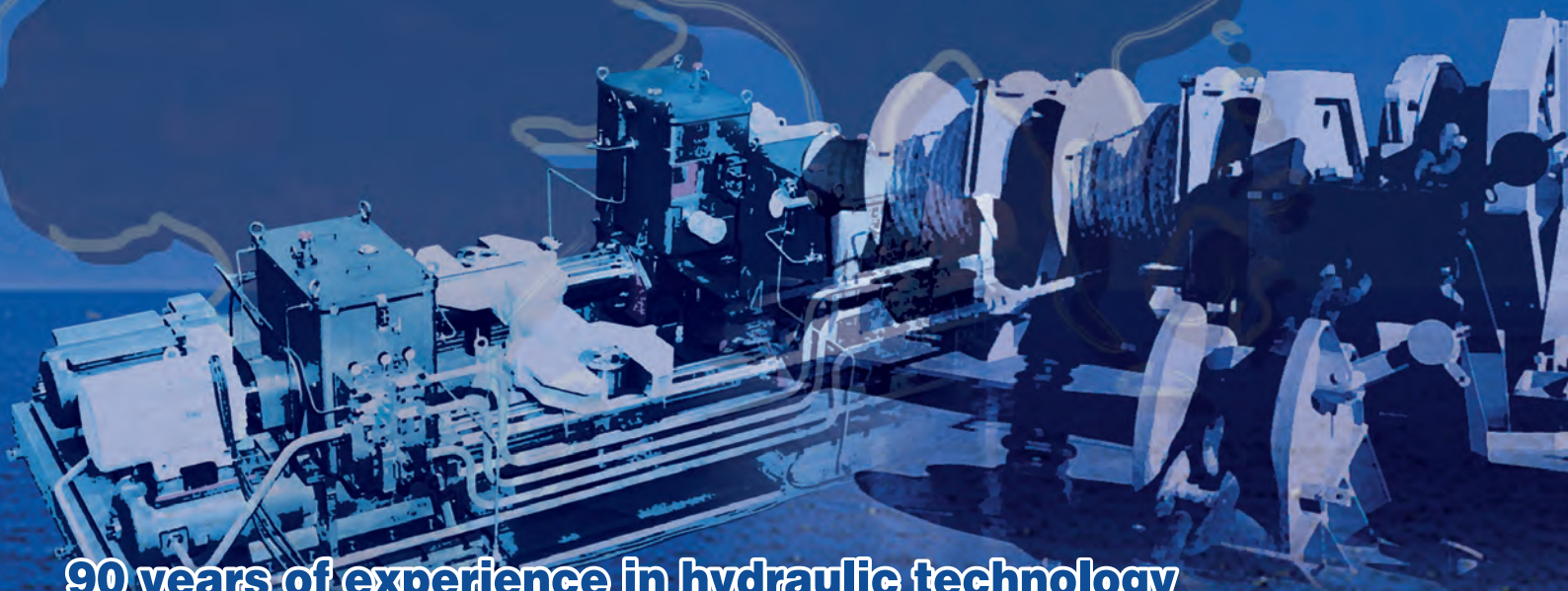

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Frequency winch onboard *Zaliv America*. (credit: Aker Solutions/Johan Lång)

reduced and the lifecycle service can be performed without the need for special software tools or a software specialist. A frequency converter can also be easily replaced without the need of a specialist.

Previously this technology has been installed on container, ro-ro and passenger/ferry vessels, it has now been developed to cater for the tanker market. Aker Solutions has delivered Pusnes FC deck machinery to five crude oil tankers, six product/chemical tankers with several shipsets also ordered.

Aker Pusnes has also in recent developments been awarded the contract for the delivery of Pusnes deck machinery to 10 newbuildings being built at the newly established shipyard, Atlantico Sul in Suape, Brazil.

The vessels will be built by Estaleiro Atlantico Sul in Suape for delivery to Transpetro, a fully owned company of Petrobras. The shipyard is currently under construction and will serve the growing Brazilian shipbuilding industry.

The project follows the discovery of large Brazilian oil reserves that has prompted the government to pursue development of the domestic industry. Development includes upstream, midstream and downstream projects.

This contract represents a first major Pusnes marine equipment delivery to Brazil. The scope of supply includes windlasses, mooring winches and hydraulic power units. Delivery will take place from March 2009 through July 2011.

Mr Haukom said: "This is a new area for deck machinery and will now see more complete contracts of vessels for Aker Solutions." *NA*

Bergen launches range of active heave cranes

Norway-based Bergen Group Dreggen has announced its latest design of active heave cranes in collaboration with Bosch Rexroth for the offshore market.

Orders for the crane are on the horizon with offers for the cranes now being sent out to prospective customers.

Active heave cranes are now becoming more popular for shipowners, due to the specialised area they work in and the demands upon the crane working in this area.

"The market has been waiting for this type of crane," said Morten Pettersen, international sales and marketing manager, Bergen Group Dreggen. "Some contracts have been signed for this type of crane already."

Together, Dreggen and Bosch Rexroth has developed the knuckle boom cranes with an active heave compensation (AHC) system, with Bosch Rexroth developing secondary controls for the design, enhancing the accuracy of the crane.

The Knuckle boom cranes will have lifting capacities up to 100tonnes and have a lift height of 200m. The cranes will be delivered to customers with a tensioning system (passive heave compensation system), AHC (active heave compensation system), MOPs (Manual overload protection) and AOPs (automatic overload protection).

They will have a load tipping moment of 25-2500tonnes, and come in either fixed boom, knuckle boom or telescopic boom and with the choice in either electro hydraulic or diesel hydraulic. The cranes will also be fitted with a high-speed whip hoist, constant tensioning; and shock absorbers to minimise the dynamic factor. The cranes will also come with loadcharts for ship to ship operation during various sea states. *NA*

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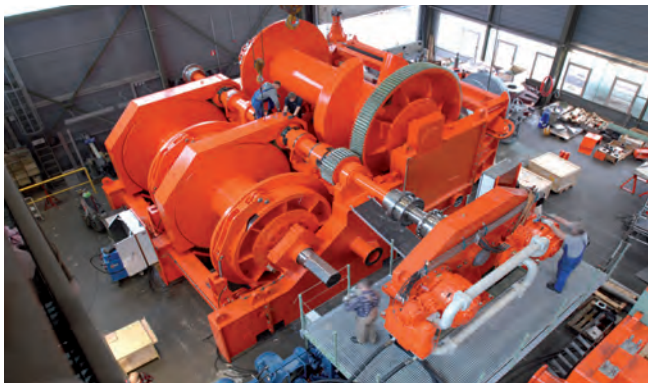
Hatlapa winches in the biggie

Germany-based Hatlapa is to supply key equipment to 12 anchor handling vessels.

The first of the 12 vessels, *UOS Atlantis*, was delivered earlier this year, with 11 of the 12 anchor handling vessels currently under construction at Fincantieri for German shipowner Hartmann Offshore.

The 3000dwt *UOS Atlantis* is equipped with diesel generator engines producing 12,000kW giving the vessel a top speed of 13.5knots and a bollard pull of 188tonnes. It is the first vessel to be fitted out with Hatlapa's anchor handling system and winches and has been operating off the coast of Egypt since March this year.

The *UOS Atlantis* was constructed at Muggianio shipyard with the other 11 vessels on order being built at Riva Trigoso, Muggiano and Palermo and are due to be delivered by mid-2010.



Hatlapa is to install one of its biggest winches built to date onboard 12 vessels.

The contract for the supply of deck equipment onboard the additional 11 vessels, will see Hatlapa install one of its biggest winches so far onboard the vessels. The 260tonne anchor winch has a pulling power of up to 450tonnes and a holding power of 550tonnes.

"This is our strongest winch to date. However, this will not be the end of Hatlapa's product development of our range of anchor handling winches. We are currently building a winch with a pulling power of 500tonnes," comments Christian Herzog, product development manager, Hatlapa. *NA*

MacGregor ups the orders

MacGregor has recently announced that it has secured orders for 32 shipsets of lift-away hatch covers worth €10 million.

A Japanese shipyard and various South Korean yards have placed orders to supply lift-away hatch covers for 32 container ships that range from 2500TEU to 12,600TEU, due to be delivered from 2010 to 2012, said MacGregor.

The contract from the South Korean shipyards will see MacGregor supply the design and key component delivery of lift-away covers for 30 vessels currently on order for European owners. While the contract for from the Japanese yard will see the design, key components and manufacture of lift-away hatch covers for two containers ships that will be delivered to Japanese owners.

MacGregor to supply side-rolling hatch covers.

MacGregor has also secured orders from Sungdong Shipbuilding for 10 shipsets of MacGregor hatch covers worth €9 million.

The contract will include the design, key-components and manufacture of side rolling hatch covers to be installed on bulk carriers currently under construction at Sungdong Shipbuilding & Marine Engineering in South Korea. The order will go through under Cargotec's second quarter for 2009, with the vessels due for delivery to European shipowners in 2010.

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Planning for the future stalled by Polish yard sale glitch

A new dawn is expected in Polish shipbuilding. Szczecin and Gydnia await their new owners – whoever they may be – to rescue the yards and the attendant industry from extinction.

Upheaval in the Polish shipyard industry has left around 9000 staff at the Szczecin and Gdynia shipyards wondering if they will have any jobs to go to as the prospective sale of the yards stalls.

Delays in making payments has left the yards in limbo with the end of June deadline passing without payment, the 17 July deadline also passed and now a new deadline of 17 August has been set according to yard executives. As *The Naval Architect* went to press it remained uncertain whether this money would be paid.

"Nobody knows [at the yard] why the money has not been paid," explained Piotr Paszkowski, member of the board in Gdynia. He is concerned that the delays could see the experienced and skilled workforce that staffed Gdynia, 5300 workers, move away from the industry.

Currently the yard employs just 74 staff, with a similar situation being maintained in Szczecin it means some 9000 former yard employees are now unemployed, posing regional difficulties.

Jerzy Czuczman, a naval architect and chairman of RINA's Polish counterpart the Association of Polish Maritime Industries, believes the yards "must find a niche", adding that Polish yards "must not try and compete in markets that are dominated by Far Eastern yards".

Effectively the Polish shipyard workforce is well trained and dynamic. Mr Czuczman states that what the yards had was plenty of comparatively cheap labour and the larger facilities were, and remain good, but it is the smaller machinery that the yards need to invest in.

It is not necessary to make heavy investments he adds. In the past there was so much labour that it was considered appropriate to allow men to lift heavy weights, but a man can lift around 25kg, whereas it is far more efficient to invest in small jigs that can lift 300kg, "with that your efficiency immediately increases," says Mr Czuzcman.

Mr Paszkowski acknowledges, however, that not all of those workers would return to the yards, even if the investment is made by the, as yet unnamed, Middle Eastern buyers.

The air of uncertainty was further enhanced when QInvest released a statement clarifying its involvement in the sale of the Polish yards: "QInvest, Qatar's largest Investment Bank, is a full service investment bank, not an investment fund. QInvest is acting as an advisor for clients who are in the process of acquiring these assets [Gdynia and Szczecin yards]. The names of these clients cannot be disclosed due to confidentiality reasons. The transaction is currently at the due diligence stage and pending completion."

> "Polish yards must not try and compete in markets that are dominated by Far Eastern yards"

In the meantime, treasury minister Aleksander Grad met trade union representatives of the Gdynia and Szczecin shipyards in July, to present a progress report on the shipyards' assets.

According to a treasury official the government wanted to listen to what the trade unions had to say and to pass on first-hand information to them [on the sale] in order to put their minds at rest.

Officials said that the delays were thought to be the result of a letter sent to the Qatar-based Qinvest bank which had guaranteed the deal. The Cooperative for the Protection of the Polish Shipyards and the Shipbuilding Industry, which wrote the letter, claim that the Szczecin shipyard may have been engaged in a "large-scale money-laundering scheme," during the last seven years, where ships had been sold off at well below market value.

Mr Grad had denounced the letter as an attempt to "sabotage" the sale of the yards. "We know that there are people who are pursuing their own interests and want the purchase process of the Gdynia and Szczecin shipyards to fall through," said a treasury spokesman.

With that statement made in July and as completion was still being awaited in August, the delays were preventing the yards from planning for the future.

"We won't know how many staff we can employ until we get contracts and we can't bid for contracts until the yards are bought," said Mr Paszkowski. So it was crucial that the money was paid in August.

Even so, it is unlikely that work at the yards will restart until the middle of next year, by the time contracts are negotiated and signed the yards expect that work will be available following this period. An initial investment of €4 million is expected but until the yards know what they will build a firmer figure on the necessary investment cannot be known.

It is, however, clear that the yards will not try and compete with their counterparts in the Far East. "You can forget it as far standard vessels go," said Mr Paszkowski, "we will look at building more complex ships, prototype vessels and offshore structures too".

He said that the drydock in Gdynia is large enough to build QMax vessels, in excess of 350m, but clients cannot be found and contracts agreed until the yards future is secured. *NA*

Solidarity brothers in Poland's shipyards are losing the faith

Solidarnosc believes the exodus of ship building skills from Poland has already begun even before the deal to save Gdynia and Szczecin has been finalised. Union believes workers are already losing faith in new owners as payment deadlines are missed.

In the cradle of Poland's democracy, the Gdansk shipyard staff were celebrating a small but significant victory as the competition commissioner Neelie Kroes approved the yard's restructuring plan in July.

Not that the workers feel that they have been treated fairly. Staffing levels in 1989 stood more than 13,000 in the Gdansk yard and it was the workers there who created the Soviet bloc's first independent trade union. That led eventually to the successfully negotiated end of communism in Poland that in turn had historic consequences for communism in Europe. Now the workforce stands at a mere 1900, with more cuts set to be imposed.

Moreover, there are claims that the calculations of the state aid given to the yard, variously calculated from 70 million Zlotys (€17 million) to 600 million Zlotys (€146 million), were grossly exaggerated, though the union accepts that these calculations are notoriously complex and difficult to make. The EC says that it will now accept what it calculated as €251 million in state aid and has brought the four-year investigation to a close.

During the period that the Polish investigation has taken place the financial crisis has battered European businesses leading the EC to relax its stringent state aid rules in an effort to help European industry find ways to survive the so-called credit crunch.

That, say the Poles, has permitted German yards to prop up their shipbuilding industry in such a way that their near neighbours have not been allowed to do.

Union officials, however, look at the deal to save Gdansk ruefully and grudgingly admit it is a victory of sorts. Gdansk will close two of its three slipways and will reduce its staff by 20%, by a further 400 workers, over the coming months.

Robert Szewczyk, international department officer on the National Commission of Solidarnosc, told *The Naval Architect*: "Staff are satisfied that the yard will remain open, but they know that the capacity will be reduced further and they are angry at the unjust and unfair treatment [from the EC]."

The yard's owners, the Ukrainian company Industrial Union Donbass (ISD), plans to build ship sections at Gdansk and to diversify into wind turbine structures.

The Ukrainian company has already invested US$185 million in Poland's Huta Czestochowa steel company and plans to raise its investment by a further US$147 million and is considering the acquisition of other Polish firms, according to Reuters.

"We are interested in buying not only in the steel sector, but also in related areas," said Konstanty Litwinow, chief executive of ISD's Polish unit. Those related areas include shipyards.

If Gdansk is the good news story in Poland's historically successful ship building industry then the plight that Szczecin and Gdynia find themselves in has the potential to be its disastrous counterpoint. New owners, that it is believed hail from the Middle East, have so far missed two deadlines in which to pay the cash for the yards. A third deadline looms on 17 August (after this publication has gone to press) and, while the mood was upbeat in both Gdynia and Szczecin in June, workers are less sanguine now.

"How many deadlines can we expect?," asks Mr Szewczyk, "they are not buying a pound of spuds", he adds. The feeling of growing pessimism is underscored by the failure of the buyer to reveal themselves.

"This is the second month in a row that we are waiting to find out who bought the yard, no one knows who's behind this. As far as the two yards are concerned it's like a stone in the water, no information whatsoever," explained Mr Szewczyk.

Jan Ruurd de Jong, the Dutch consultant who has been acting as agent for the prospective buyer has not been contactable.

As a result of the new owner's agent going missing, allied with the company's failure to meet payment deadlines, the confidence of the 9000 or so sacked staff has ebbed away.

"Some Polish yard workers are looking for jobs in other private yards in Poland, others are migrating to other European shipbuilding countries such as Norway," said Mr Szewczyk. Mr Szewczyk estimates that the impact on the region could be devastating should the deal fall through, with up to 40,000 workers in related industries, such as steel mills and other smaller engineering firms dependant on the operation of the yards.

Yard workers in Poland look at the bail out of European banks which added up to billions of euros and ask why can't the EU help the shipyards in the same way? It is a pertinent question, to which Ms Kroes says it is difficult to assist the yards in the same way.

Disbelief among the workforce as to how the Polish shipbuilding industry has managed to decline quite so rapidly and to such desperate depths is widespread. "Polish yards can compete on quality, we have many years of experience," said Mr Szewczyk, adding that: "One owner said that he could buy a ship in Asia that would last 20-30 years but he could build a ship in Gdynia that would operate for 35-40 years."

Effectively the Polish workers feel let down by the system, by the EU and the EC and they have an ever increasing sense of foreboding about the one straw to which they still clutch, that this new owner will finally ride their rescue with a plan that works.

When Neelie Kroes asked to meet the workers of the Gdynia and Szczecin yards in a recent visit they rebuffed the European Commissioner. "They asked what's the point of her going to view the corpse?", said Mr Szewczyk. *NA*

Timing is everything for Hamworthy's Baltic centre

Timely Polish naval architect's design centre acquisition sees Hamworthy well placed to take advantage of new dawn in the country's shipyards.

Hamworthy Baltic Design Centre (HBDC) chief designer Krzysztof Czerski credits good timing for the deal that saw Hamworthy buy 79% of his company in October last year. But for the Hamworthy group, the logic is clear of adding a team of naval architects and consultants specialised in gas ships and equipment to the group.

HBDC has its roots in the design office of the Stocznia Gdynia shipyard, with long experience designing ro-ro, tanker and bulker tonnage. Czerski says establishing the Baltic Design Centre as a stand-alone entity proved challenging, but the partners' faith began to be repaid.

"Slowly we completed some designs and received some orders. One of our first big jobs was a workshop design for the conversion for a diving support vessel, which was quite successful and nice work," he says.

A steady stream of conversions and further design work followed – some flowing from the Gdynia and Remontova yards – including contracts for ship systems and failure modes effects analysis (FMEA) for a new LNG carrier design.

In a recent contract, HBDC completed a five-month project at the Nauta Shiprepair Yard in Gdynia on behalf of Norwegian owner BOS, calling for the conversion of a fishing trawler *Polar Timmiarmiut* into the seismic vessel *BOS Atlantic*. HBDC completed the basic/class and detailed documentation, involving up to 30 designers, producing 117 classification drawings and 266 workshop drawings, each with its own material list.

In addition to undertaking supervision of construction, HBDC also prepared stability analysis and later supervised the execution of inclining tests, including the preparation of final reports.

The relationship with Hamworthy was already established since it supplied LNG handling systems to Gdynia. "We already knew those guys and when we met again and they discovered that we were independent, we first discussed cooperation and then later the opportunity to work more closely," he explains.

Joining Hamworthy provided not just the synergy but also scale. "For us, this was a great deal because to join a company structure is important at a time like this. It is very hard to find jobs without a big partner." HBDC can now tap into Hamworthy's global office and customer network, bringing the group better insight into its customers' operational requirements.

The renamed company sits in the Hamworthy Gas Systems (HGS) division with its first projects 'in-house' for HGS. Mr Czerski says the long-term plan is for HBDC to extend its design expertise across the whole group.

> "Joining Hamworthy provided not just the synergy but also scale. For us, this was a great deal because to join a company structure is important at a time like this"

"We are working on some common projects for Hamworthy Moss, which I hope we can build on. For now we concentrate mainly on gas carriers and on vessels fuelled by gas, doing internal jobs such as component design, drawings and software work."

The next step is for HBDC to prepare complete packages of ship designs, incorporating Hamworthy equipment to the greatest extent possible, combining the two core opportunities to market equipment and sell original designs.

It is a strategy he sees finding a market in developing shipbuilding nations – and China in particular – where Hamworthy can leverage its access to owners and offer complete designs from HBDC at shipyards which would previously struggled to fulfil the required levels of quality.

Current design work is centred on a family of small gas carriers for short sea work, LNG carriers of 10,000m^3 and 2000m^3 and LPG/ethylene ships of 5000m^3 and 7000m^3. Collaborative work with HGS involves preparing designs for the LNG-powered ships of the future, in particular a dual-fuel ro-pax which Czerski says will be vital to HBDC's future market.

He says the good relationship it has always enjoyed with Hamworthy has meant that HBDC has been able to maintain its identity despite joining a larger organisation. "We have good and very friendly relationships with our partners in HGS. Part of our capacity belongs to the group, but we have some freedom to market our own activities too."

There is even a chance of work close to home with the possibility of an LNG terminal in Poland and rumours that the new owner of the Gdynia and Szczecin yards is considering building LNG carriers if the sale goes through.

In the meantime, HBDC's expertise in stability analysis and FMEA consultancy will continue to find a market as design requirements move from the prescriptive to the probabilistic. The greatest demand so far is for FMEA analysis for cargo tanks and creating new designs that take changing regulation into account.

"We have prepared new designs that reflect for example the changes to fuel tank positions and other regulations, trying to look forward," he says. "Sometimes this is complicated and sometimes the customer wants a vessel that is as simple and safe as possible. As a naval architect, that's always what I am trying to do: damage stability is always in the back of the mind." *NA*

Genfer Lloyd rolls with the punches

Financial crisis and recession added to the turmoil in the Polish yards has presented designers Genfer Lloyd with a period it can use to restructure and focus on the future said the company.

Following the steep decline in the world economy and consequently the shipping industry over the past year, the maritime industry's strength has been tested. In consequence ambitious plans for the development of more than 70 designs have now been postponed, although not completely cancelled, said naval architects Genfer Lloyd.

The company has modified its organisation to become more efficient and flexible with Genfer Lloyd Design (GLD) and Blue Buoy Design (www.bbuoy.com) formally GLD Studio Team, which made 3D modelling, renderings and animations, both will be based in Szczecin.

The company was recently involved in the investigations and a development of a solution to the vibrations problems onboard a Baltic ro-pax ferries. To solve the problem, a 3D model of the area under investigation was built, and this provided the basis for the necessary dynamic calculations and final preparation of the structure modification drawings to class approval.

In addition GLD recently finalised a classification project of a 7600dwt multi-purpose carrier, developed with the Dutch company BV Kustvaartbedrijf Moerman. The vessel has fully boxed shape holds and is capable of handling all classes of dangerous cargoes, as well as having a 1A ice class notation. Driven by a ducted CP propeller the vessel will have a service speed of about 13knots. After searching for a possible builder for this vessel GLD will continue the project and will prepare detailed engineering plans.

Another significant project is the conversion study of a floating crane GLD completed for the Polish company Project Zegluga. The target was to significantly increase the crane capacity. The scope of design works included new general arrangement, longitudinal strength and stability calculations.

GLD has had newbuildings and conversions and modifications of vessels approved and in service. One of the most interesting examples is a classification project and FEM extensive calculations for the conversion of the 260m-long 63m-wide ocean-going launch/cargo barge H-851 for Dutch company Heerema Marine Contractors.

External rending of accommodation block by Blue Buoy Designs for Genfer Lloyd project.

3D image rending of the master cabin design on luxury yacht.

GLD have also been involved with making calculations in preparation of documents for the new emergency towing requirements, introduced in SOLAS MSC.256(84) adopted 16 May 2008, applicable to all ships above 500gt and implemented for all passenger ships not later than 1 January 2010. They have also undertaken shore power supply "cold ironing" studies for ro-ro vessels is some European ports.

Genfer Lloyd Design is a part of Genfer Lloyd Company (www.genferlloyd.com) established in Poland, in 2004. The company provides design, engineering, construction and outfitting services for the offshore and shipbuilding industry. GLD use a wide range of industry standard software including Nupas/Cadmatic, Auto Cad, Tribon, NAPA, NISA/Display III, Nauticus, Poseidon, Rulescalc, Ansys, Rhinoceros, Expander, Inventor and Mars. GLD provides not only design services but also consulting in solving technical problems of vessels in service.

Having four design departments: Stability and Strength, Hull Structure, Machinery and Outfitting, Electrical and Automation, GLD is able to provide complete project; all design stages as well as respective supervision during construction and outfitting. The Polish design office, for three years now, has successfully continued its cooperation with Lloyd's Register.

Within a few years of establishing itself in the marine market, GLD also began to participate in a few offshore projects for Bergen Mekaniske Verksted AS (Norway) and the company set up a Norwegian office in Haugesund. The last such project has included producing a wide scope of workshop documentation; including 3D model of hull structure, lofting and structure detailed/workshop documentation, machinery arrangement and piping 3D model, piping isometric drawings, detailed/workshop documentation, material lists for a number of seismic, ROV/construction and diving support vessels.

For the yachting company Palmer Johnson Norway, Genfer Lloyd has prepared classification documentation for supply vessels and for 80m steel yachts with engine propulsion.

In cooperation with the Polish company Maritime Safety and Security GLD is helping to develop a portable, passive anti-piracy system that will be fitted aboard of vessels, resulting in a new product on a market, more details of which we hope to be able to report on soon. *NA*

Compendium Marine Engineering

Review by Mark Staunton-Lambert

Compendium Marine Engineering
Editors Hansheinrich Meier-Peter and Frank Bernhardt
ISSN 978-3-87743-822-0
€98 Hardback 1016 pages
Size 170 x 240mm
Published by DVV Media Group
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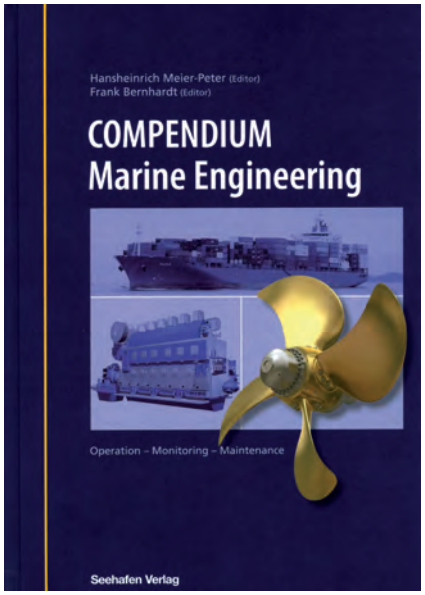
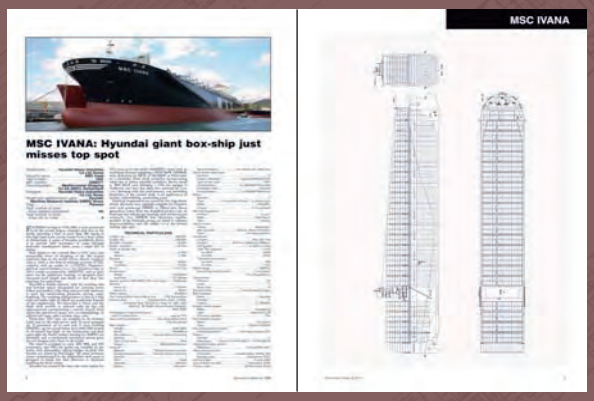


The German edition was first published in 2006 by the same company that produces the *Schiff & Hafen* magazine, it has now been translated into English. Aimed more at the practicing marine engineer rather than the naval architect it still provides a useful reference book, although its German heritage is still obviously in places. With two editors and 21 authors is covers a wide range of topics; Chapter 1 deals with the principal elements to be found onboard ships from the main engines to piping systems. The following chapters are then devoted to the various systems as propulsion and drive systems (chapter 2), electrical and electronic systems (chapter 3) measuring, monitoring and control systems (chapter 4), supply and disposal systems (chapter 5), ventilation, air conditioning and refrigeration systems (chapter 6), cargo handling systems (chapter 7) and manoeuvring systems (chapter 8). These sections make up the majority of the book taking up just over 800 pages. The subsequent chapters deal with ship types and such technical details as hydrodynamics, stability, strength, sea-keeping and other aspects, presented in a extremely compact form (chapter 9), followed by fire fighting, safety and rescue systems (chapter 10), maintenance (chapter 11), damage and how to deal with it (chapter 12), regulations (chapter 13), and finally, details on how to convert traditional units into SI units (chapter 14).

Each of the chapters attempts to provide a reasonable balance between theoretical matters and practical experience. At the end of each chapter there are a series of references given to the original sources material, unfortunately these are mainly written in the German language. *NA*



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The Royal Institution of Naval Architects published the 19th edition of its annual Significant Ships series in February 2009. Produced in our usual technically-orientated style, *Significant Ships of 2008* presents approximately 50 of the most innovative and important commercial designs delivered during the year by shipyards worldwide. Emphasis is placed on newbuildings over 100m in length, although some significant smaller cargo ships, fast ferries and offshore vessels have been considered, including a cross-section of ship types, with each vessel being either representative of its type or singularly significant. Each ship presentation comprises of a concise technical description, extensive tabular principal particulars including major equipment suppliers, detailed general arrangement plans and a colour ship photograph.

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The Ship Stability Research Centre / University of Strathclyde
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SOLAS 2009 – Challenges and Opportunities

26-29 October 2009

COURSE PROGRAMME

Monday, 26 October 2009 (afternoon)

1. Regulatory Framework for Damage Stability
   - 1.1 Deterministic concept of ship subdivision (SOLAS 90 and Stockholm Agreement)
   - 1.2 Probabilistic concept of ship subdivision (SOLAS 2009)

Tuesday, 27 October 2009

2. Probabilistic Framework of Damage Stability
   - 2.1 p-factor
   - 2.2 s-factor
3. Probabilistic Framework of Damage Stability
   - 3.1 Design implications
   - 3.2 Worked examples

Wednesday, 28 October 2009

4. Hands-on workshop on design implications of SOLAS 2009

Thursday, 29 October 2009

5. Risk-Based Design
   - 5.1 Performance-based assessment of damage survivability
   - 5.2 Risk quantification and Safety Level
6. Risk-Based Design
   - 6.1 Platform optimisation
   - 6.2 Worked examples

EXPECTED BENEFITS

Applying SOLAS 2009 is a good example where fostering experience by using all available expertise is now a must. It is vital that industry gains in-depth understanding of the theory and practical applicability of the new rules for damage stability as well as appreciation of the level of safety offered by these rules. Equally as important is know-how in using this understanding to exploit the freedom offered by the probabilistic rules to harness innovation and meet societal demand for higher safety standards cost-effectively. Drawing from considerable knowledge, expertise and experience, this course will address these needs, aiming to equip delegates with those skills, which can be applied in the short- and medium-term to turn the challenges presented by the new rules to exploitable opportunities in ship design and operation. The course material will provide ample back up and reference to "tools" and techniques of addressing damage stability and survivability while tutorials and hands-on workshops will ensure that delegates gain maximum immediate benefit.

Course venue: The Ship Stability Research Centre
Course fee: **£1,250.**
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Fundamental to the successful design and operation of any ship is the importance of relevant, timely and accurate information and feedback. Today, much of this is undertaken by way of Information Technology; but, we should not forget that there is also a human element to every information management system. Issue 21 of Alert focuses, therefore, on Information Management.

A quick glance at the centrespread feature in this issue will lead the reader to question whether there is too much information required of, and available to, the maritime community today – with the risk that too many disparate information management systems, often with little integration or coordination between them, could be detrimental to the safe conduct of the ship and the safe and timely delivery of its cargo.

Issue 21 is now available from www.he-alert.org

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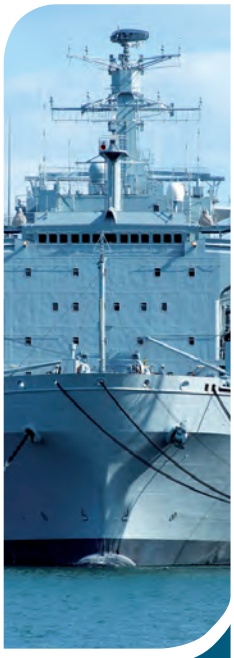

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By Lisa C. Hix Ref: IDMYD
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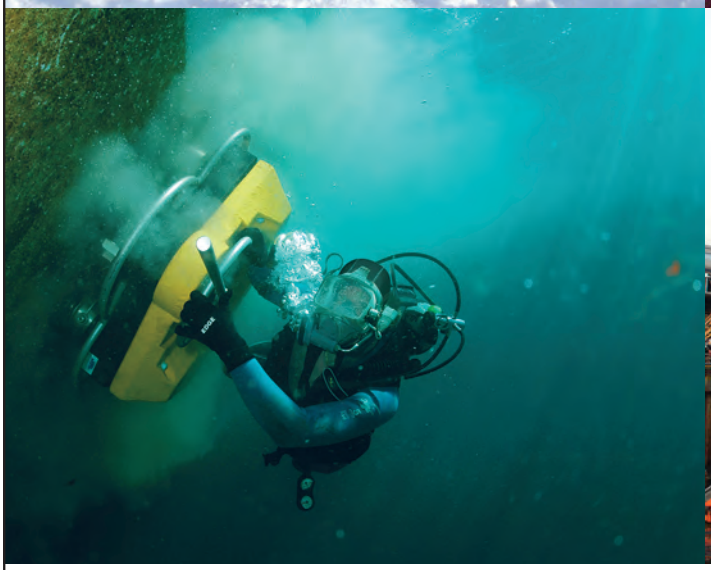

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