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Greenship technology / CAD/CAM update / Vietnamese shipbuilding / Norway's marine industries

January 2009

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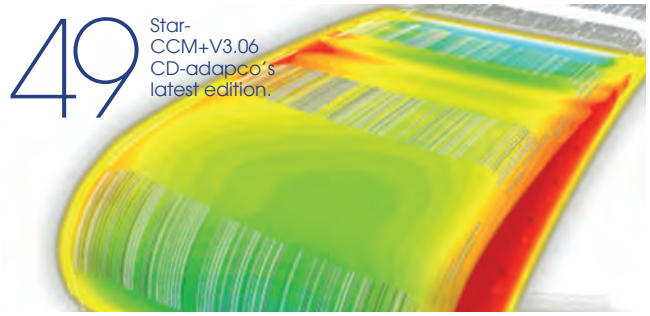

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26-71 Features

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.

Environmental tipping point

Gas scrubbers are a staple of land-based power generation. Is it really so difficult, costly or unattractive to apply them to ships?

EU leaders may have used the spectre of recession to renege on their green commitments, but there is little doubting the passion for the environment felt by Jørn Winkler, founder of ship technology company DK Group. Specifically, Mr Winkler is on a campaign to draw shipping's attention to its true environmental impact, and to shake up an industry whose response he believes amounts to tokenism at best.

He points out that a leaked UN report has suggested that, as of the first quarter of 2007, the maritime industry accounted for around 1.2 billion tonnes of CO_2 annually – almost 100% higher than earlier estimates. With the current newbuilding programme in mind, this will rise to over 2 billion tonnes by 2015, while SOx emissions from shipping soar to 20 million tonnes, and NOx emissions to 37 million tonnes.

In being responsible for transporting 95% of the world's products, shipping often characterises itself as the most environmentally-friendly form of transport in the comparative sense, but it actually generates 97 times more SOx and NOx than air transport. The world's 750 million cars, meanwhile, emit around 88,500tonnes of SOx per year. Consider this against the 90,000 ships that burn 370 tonnes every year, and emit an estimated 20 million tonnes of SOx. Think about it.

Again, Mr Winkler cites last year's report by the American Chemical Society journal Environmental Science and Technology, which calculated that shipping was responsible for 60,000 premature deaths per year.

Mr Winkler also cites the work of Cecile Mauritzen, senior scientist in the climate division of the Norwegian Meteorological Institute, on the way aerosols carried in particulate emissions from ships contribute to an almost constant presence of particles in the atmosphere close to shipping lanes, increasing rainfall there, and in turn sending concentrated larger volumes of particles into the oceans. There could be a link between this phenomenon and severe droughts being experienced on land.

Mr Winkler believes legislators are missing another mark. Soot-infused or dirty snow contributes to a third or more of Arctic warming, according to the University of California. SECAs are simply not enough. "There is only one group of people within 500 miles of that ice," says Mr Winkler. .

Beyond the polemic, Mr Winkler is a tireless advocate of environmentally-friendly technology in shipping. Indeed, his company has come up with a patented air cavity system to reduce friction between the hull and the sea (see *p26-27*). Why is it, he wonders, that so many energy-efficient solutions have been proposed and then rejected? Kappel propellers, which purport to save 4% of fuel and CO_2, have been available for 20 years, but not widely used.

His damning answer is that, even very promising ideas have been discarded as "not workable" because shipowners have failed consistently to take on the full scale investment and thorough testing required. Why do owners shun ideas that could actually save them money?

"People often say, 'well, the yards won't build ships featuring new technology', but look at *Emma Maersk*. Within six months, every yard in Asia was able to offer ships of this type." It is up to shipowners to invest in developing workable designs that yards can follow, Mr Winkler reckons.

Gas scrubbers, for example, are staples of the land-based energy sector. Mr Winkler says that the price of marinised scrubbers has been distorted, and that such installations need not cost more than US$1 million per ship. Furthermore, why, he asks, if scrubbers reduce SOx by 99%, and NOx and particulate matter by 85% at a total industry cost of US$50 billion while still burning heavy fuel oil, have certain sections of the shipping industry chosen to lobby for a switch to distillates, which will reduce SOx by 80%, and particulates by only 35%, at an estimated cost of US$250 million? And where is (IMO's conservative estimate) the 382 million tonnes of distillates slated for 2020 consumption by shipping to come from? And, as well as the estimated $200 billion surplus in fuel costs owners could expect to pay for using distillates, isn't it relevant that distilling 382 million tonnes of distillates would generate 20% more CO_2?

"We are using the knowledge we already have to make a difference," says Mr Winkler. "That is our duty. What is yours?" *NA*

Materials

SPS for newbuildings

Formal plans have been launched that look to use sandwich plate technology in shipbuilding. The material solution involves the injection of a polyurethane elastomer core between slim steel plates, which has hitherto found favour with shiprepairers. Once the elastomer core has set, the plate is more resilient than steel.

Now, a new agreement has been reached between Daewoo Shipbuilding and Marine Engineering Co Ltd (DSME) and technology developer Intelligent Engineering to take SPS into the mainstream shipbuilding sector. The deal was facilitated through Cass Maritime.

The agreement provides for the formation of a new company, in which DSME will be "a significant" shareholder, to develop and licence SPS technology for shipbuilding and offshore applications.

DSME chief strategy officer Young-Youl Koh (right), and Intelligent Engineering chief executive Michael Kennedy sign the agreement opening the way for the sandwich panel system to be used in newbuilding.

Compared to stiffened steel, which is labour intensive and susceptible to fatigue and corrosion, IE says that SPS requires 40% less labour, significantly reduces build complexity and costs, and provides superior life cycle performance. Lloyd's Register has said: "SPS is superior in every practical way to conventional stiffened steel plate."

DSME has been working with IE for the past year, developing and testing new applications. The first development project involved the design and construction of a liftable car deck, as would be used on a pure car carrier.

Work will now commence on an extensive programme that includes: lightweight car decks, accommodation blocks, tank tops and hatchcovers. Construction of the first hatchcover has already been completed.

Safety

Winterisation first

Primorsk Shipping Corp has named *Prisco Alexandra*, professed to be the first vessel built to comprehensive new global standards for ice-class vessels. The 51,000dwt product tanker has been built in South Korea to rules developed by Lloyd's Register.

Prisco Alexandra is the first of seven sisterships to be built for PRISCO at STX Shipbuilding Corp's yard in Jinhae. It has been constructed to new winterisation notation that extends the coverage of current standards beyond basic hull structures to include the products and equipment that are essential for safe and reliable operations in freezing temperatures. PRISCO was instrumental in the formation of the new rules.

Luis Benito, country manager - Korea, Lloyd's Register Asia, said: "There is a growing requirement for our clients to operate vessels in the harsh conditions of the Arctic, so it is essential to have clear and comprehensive minimum standards of performance to protect seafarers and the delicate marine environments in which they operate. These winterisation notations provide clear guidance for all parties."

Konstantin Globenko, director of PRISCO's technical department, said: "We believe that being the first to build to this class notation is only the first step. Eventually, all oil companies, charterers, flag and port authorities and terminal operators working in Arctic waters will realise the importance of the proper winterisation of vessels," he said.

The new notation, known as Winterisation 'D' (-25), covers everything from the paints used in ballast tanks and the sealing materials for valves to the location of water heaters, store rooms and steam lines.

STX is expected to deliver four more product tankers to PRISCO next year, with the final two units expected in 2010.

Shipbuilding

French state buys into STX

STX Europe and the French Republic have agreed for the French state to become a 33.34% shareholder in STX France and its shipyards in Saint-Nazaire and Lorient, via an equity investment of in total €110 million.

STX Europe claims a 35%-40% share of the cruiseship market through its yards in France and Finland. The French yards also have experience with navy vessels.

The French state's initial payment will be supplemented, based on STX France's performance over the period 2009-2011, by an earn-out mechanism whereby the French state will make a direct payment of up to €83,3 million to STX Europe. If the parties decide to increase

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the capitalisation of STX France, this amount can be reinvested in STX France and supplemented by the French state, so that STX France will receive a total amount of up to €125 million. The total equity injection would then be €235 million, with an implied value of STX France of €470 million.

STX Europe will continue to be the controlling shareholder of STX France with just above 50%, while the French Republic will own approximately 33.34%. Alstom Holdings SA, previously a 25% shareholder of STX France, will own the remaining shares, amounting to approximately 16%.

According to the agreement, the French Republic shall be represented to the Board of Directors of STX France by at least two members.

Design

Hamworthy buys into design

Hamworthy has taken a majority interest in Baltic Design Centre Limited (BDC), the ship design and consultancy business based in Gdynia, Poland. BDC will be renamed Hamworthy Baltic Design Centre (Hamworthy BDC).

Hamworthy chief executive, Joe Oatley, said that the acquisition would both increase the cost competitiveness of Hamworthy's gas systems business and augment the group's wider design capabilities. "For our existing businesses it means we can obtain a better insight into our customers' operational requirements and optimise our system designs," he said.

BDC already provides sub-contracted design services to Hamworthy's gas systems business in Norway. Rafal Kroczka, managing director of BDC, said: "Our existing relationship and knowledge of Hamworthy's business will assist with efficient integration of the companies. After introducing the procedures and quality systems already employed in other companies of the group, Hamworthy BDC will be able to offer to its current and future customers enhanced design services and financial security for larger scale projects."

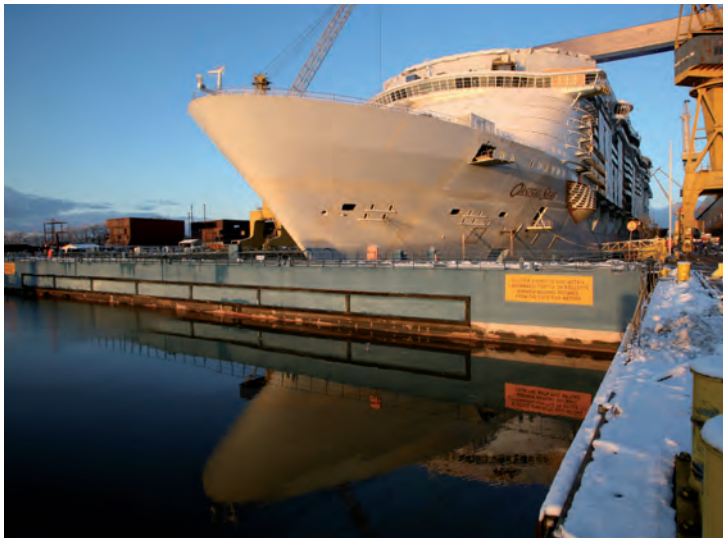
Hamworthy said that Hamworthy BDC would continue to develop its scope of design for new vessels, particularly LNG/LEG/LPG and offshore vessels, as well as conversion and overhauls.

Cruiseships

New *Allure* from RCI

Royal Caribbean International has laid the keel of *Allure of the Seas*, the second of its Oasis-class cruiseships, at STX Europe's shipyard in Turku, Finland.

When she launches in 2010, *Allure of the Seas* will share the title of the world's largest cruiseship with sistership



Oasis of the Seas **on float out in November 2008. The vessel, to be the world's largest ever cruiseship, is due delivery by the end of 2009. Now, the keel has been laid for sistership *Allure of the Seas*.**

Oasis of the Seas. *Allure of the Seas* will span 16 decks, encompass 220,000grt, carry 5400 guests at double occupancy, and feature 2700 staterooms.

Allure of the Seas will encompass seven distinct themed areas, including the 'open to the sky' Central Park, located in the centre of the ship and spanning more than the length of a football field. Central Park will be lined with boutiques and specialty restaurants, overlooked by balcony staterooms rising five decks high.

New categories in onboard accommodations for guests on *Allure of the Seas* include bi-level, urban-style Loft Suites and two bedroom/two bathroom AquaTheater Suites.

Shipbuilding

Cammell Laird comeback

Cammell Laird rose from the ashes on November 17, after the Birkenhead-based company that has been trading as Northwestern Shiprepairers and Shipbuilders for the last seven years rebranded itself, having secured the rights to the historic name earlier this year.

Cammell Laird closed its gates in 2001 leaving the site, including its modular shipbuilding hall deserted. In the seven intervening years a small group of Cammell Laird's former management team led by managing director John Syvret, built up the new company at the shipyard.

Mr Syvret said the time was right to bring back Cammell Laird in support of its marine services business.

Propulsion

Wärtsilä adds CMD licence

Wärtsilä and Chinese company CSSC-MES Diesel Co Ltd (CMD) have signed a licence agreement for the manufacture and sale of Wärtsilä low-speed marine diesel engines by CMD in China. The agreement grants CMD the right to manufacture all sizes of Wärtsilä RTA and RT-flex low-speed engines at its factory in Shanghai. CMD will focus on building engines of 60cm cylinder bore and above.

Support for the manufacture of Wärtsilä low-speed engines by CMD will be provided by Wärtsilä in Switzerland. Wärtsilä currently has 17 licensees related to production of low-speed engines located in Asia, South America, and Europe.

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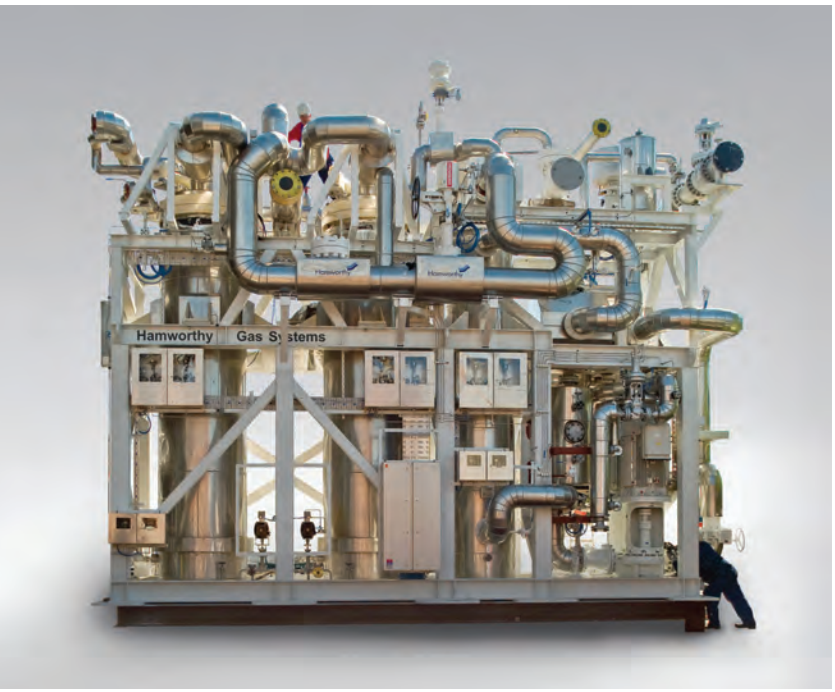
Ancillary equipment

Hamworthy delivers regas first

Hamworthy has supplied its first onboard LNG regasification plant - the first of four such installations due delivery from the supplier.



Hamworthy's regasification plant.

Hamworthy delivered an onboard vapouriser system to be installed on the 145,000m³ LNG shuttle regasification vessel (SRV) *Suez Neptune*. SRVs are designed to transport and store LNG, and then vapourise it into natural gas that can be sent ashore by subsea pipeline. *Suez Neptune* was launched in September and is the first of two SRVs under construction at Samsung in South Korea (hull Nos 1688 & 1689) for Höegh LNG to serve the Neptune terminal in Boston, Massachusetts. Gas trials are scheduled for May/June 2009 and *Suez Neptune* will be in operation around September 2009.

Hamworthy is supplying three regasification skids per ship. Each shipset will have a regasification capacity of 210tonnes/hr of LNG with a send-out pressure of 115bar.

Hamworthy's second project comprises plant for a 138,000m³ LNG floating storage and regasification unit (FSRU), *Golar Winter*. This vessel will be chartered by Petrobras in an LNG import project located in Guanabara Bay, Brazil, where gas will be sent from the vessel to an onshore gas grid. Gas trials will take place in April 2009 for operation in July/August 2009.

In October 2009 gas trials will take place on the second Neptune SRV, *Suez Cape Ann*, which will have equipment installed at Samsung in February 2009 for operation in Boston in January 2010.

The fourth project will be on the FSRU *Golar Freeze* for Dubai Supply Authority (DUSUP) and Shell in Dubai, for which Hamworthy is delivering the skids in September 2009.

Contact Hamworthy Gas Systems AS
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Tel +47 8154 8500
Fax +47 8154 8510
E-mail gasinfo@hamworthy.com
www.hamworthy.com

Ancillary equipment

ABB wins gas carrier orders

ABB has secured orders worth a total of $75 million to supply propulsion, power-generation and power-distribution systems for several new liquefied natural gas carriers to be built in South Korea.

The new projects include; electric propulsion units, generators, frequency converters and other electrical equipment for the world's first floating natural gas liquefaction vessels, to be built for FLEX LNG by

Image courtesy of Daewoo-Mangalia Heavy Industries

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Samsung Heavy Industries. These vessels will be used for the extraction, liquefaction and transport of natural gas from previously inaccessible subsea reserves.

Complete electrical propulsion and onboard power systems orders have also been won for several vessels for Brunei Gas Carriers Sdn Bhd, to be built by Daewoo Shipbuilding & Marine Engineering (DSME). The vessels will transport LNG from Brunei to Japan.

Scheduled commissioning and delivery of these vessels ranges from 2010 to 2012.

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Ancillary equipment

Total gets turbocharged

Concordia Maritime and French energy company Total plan to install MAN Diesel turbochargers with the VTA variable turbine area technology aboard a new tanker. The turbochargers with VTA technology will equip the MAN B&W brand type 6S46MC-C low-speed engines aboard the new tanker *Stena Progress*. On the basis of earlier trials, they are expected to reduce fuel consumption by around 2%-3% with parallel reductions in exhaust emissions.

Stena Progress is a 65,200dwt shallow-draught ice class tanker of the P-MAX type under construction for Concordia Maritime at the Brodosplit shipyard in Split, Croatia, where the main engines will also be built under licence. The tanker is due for delivery in June and will be chartered to Total.

MAN Diesel type TCA55V turbochargers will be used on both the six-cylinder 6S46MC-C low-speed main engines aboard the *Stena Progress* and other P-MAXs. MAN Diesel noted that the results of field testing aboard the *Stena President* were closely monitored and exceeded expectations, leading Concordia Maritime to the decision to equip the engines of other P-MAXs with VTA turbochargers.

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E-mail mandiesel-cph@mandiesel.com
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Noise and vibration

P&O's good vibrations

Marine Software has received an order covering vibration monitoring upgrades for 16 vessels operated by P&O Ferries. Marine Software will work with RCM Marine, which will be supplying the RCM 'Mariner' handheld units and constructing the unique equipment databases for each vessel as part of the standard package.

The Marine Planned Maintenance ('MPMWin') has been upgraded with an additional vibration job routine which, is linked to a machine in the RCM vibration Database. P&O Ferries' engineering staff will take vibration readings as part of their normal planned maintenance routines using the RCM 'Mariner' unit. Vibration readings will then be downloaded into the RCM Software which will give users a simple traffic light status of the machinery, along with access to all previous readings and graphs.

The RCM Mariner handheld unit will be supplied as part of the package for P&O Ferries.

The 'MPMWin' is automatically updated with the readings and will re-schedule the vibration job routine depending on the received readings. If any Alarms or Pre-Alarms are received, the users will be notified in the Planned Maintenance System.

The Planned Maintenance System also links to the RCM Marine 'Voyager' system, which is mainly used for constant monitoring of turbo chargers, inaccessible cargo pumps, equipment in intrinsically safe areas or any other machine critical to the vessel's operation. If an Alarm state is found the 'MPMWin' will provide simple remedial action instructions to the engineer and also record into history any alarm events.

Contact Marine Software, Units 3 & 4 Aylesham

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www.marinesoftware.co.uk

Propulsion

MAN's Tier II breakthrough

MAN Diesel has concluded a major order for the first IMO Tier II version of its new 48/60CR four stroke engine with common rail fuel injection.

Worth over €35 million, the contract centring on the 48/60CR was signed by Jari Kujala, purchasing manager, Aker Yards Oy, Rauma, Finland and Prof. Dr. Wolfram Lausch, senior vice president at the MAN Diesel Marine Medium Speed Business Unit. The contract covers the main propulsion and onboard power supply equipment for two large ro-pax ferries being built by Aker Yards for P&O Ferries.

For each ship MAN Diesel will supply four inline seven cylinder type 7L48/60CR main engines, each rated 7600kW at 500rpm and four gen-sets based on inline seven cylinder type 7L 21/31 engines, each rated 1463kWe at 1000 rpm. The scope-of-supply is completed by two double input/single output shaft reduction gears and two controllable pitch propellers per ship. The gears will be supplied by MAN subsidiary Renk AG, Augsburg and the propellers by the MAN Diesel works in Frederikshavn, Denmark.

As well as the propulsion equipment ordered, for the two ferries, the contract also provides an option for the same scopes-of-supply for two further ro-pax vessels.

Contact Man Diesel, Teglholmsgade 41, DK-2450 Copenhagen SV, Denmark
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Ancillary Equipment

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Carnival sues on *QM2*

Carnival Corp has launched a US$100 million plus lawsuit against Rolls-Royce and Converteam, seeking damages arising from the "defective propulsion system" fitted to the *Queen Mary 2*.

Carnival is seeking trial by jury to decide whether it has been ill-served by the suppliers of the four podded propulsors affixed to the *Queen Mary 2*.

According to the complaint, registered in the Southern District of Florida courts in early December, Carnival had been assured by Rolls-Royce and Converteam (then Alstom Power) during the design process of the $800 million-plus ship that the Mermaid podded propulsion system was a proven and well tested product. "The Mermaid turned out to be a defectively designed and built product which was in fact at an experimental stage of its development and seriously under-designed when it was put into operational use," the complaint says.

The complaint also notes that the Mermaid system had been subject to widely publicised failures in previous ship installations. By 2003, the year before *QM2's* delivery, Carnival was aware of 22 separate Mermaid pod failures on seven different cruiseships. This had "caused a great deal of concern at Carnival". This is a reference to the Mermaid systems onboard a series of cruiseships operated by Royal Caribbean International subsidiary Celebrity Cruises, whose repeated drydockings due to failure and loss of revenue led to a separate $300 million court case filed by RCI in 2003, which is still in the Florida courts. Alstom has since settled out of court. The Carnival complaint also notes that Regent Seven Seas Cruises has also been pursuing a claim related to problems occurring with Mermaid pods on the cruiseship *Seven Seas Mariner*.

Many of the failures experienced until 2003 had been attributed to bearing wear and cracking.

According to the new Carnival complaint, however, the defendants "repeatedly represented to Carnival that the problems experienced on other vessels would not occur on the *QM2* due to an advanced pod design and improved components used in the pods".

"Problems with the Mermaid pods on the *QM2* began shortly after the ship was put into operation and have continued to date," the complaint says. "The Mermaids are simply defective and do not function as it was represented that they would…The Defendants either do not know how to fix the Mermaids, or they do not want to spend the money to redesign the Mermaids and/or replace them."

Elsewhere, the complaint suggests that "Rolls-Royce and Converteam failed to undertake the necessary research, development and testing to ensure the proper functioning of the Mermaid". Carnival had had to "develop and institute limitations upon the operation of the Mermaid in an effort to reduce the operational stresses and reduce the number of failures".

In going ahead with its selection of the Mermaid system despite earlier events, Carnival had been assured that the *QM2* pods were specifically designed for the ship, based on ship-specific hydrodynamic model testing and stress analysis, and that they would feature improved lubrication, utlising higher viscosity oil, security filters, cross-flow

In the dock: *Queen Mary 2* in Blohm + Voss in 2005.

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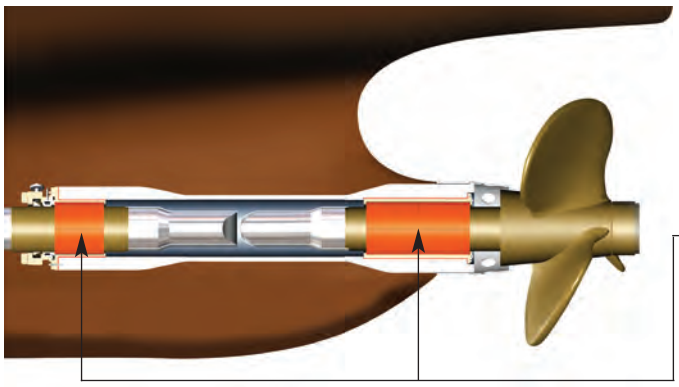

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lubrication and improved piping. The *QM2* Mermaid pod bearings would also benefit from a "No-Wear" bearing coating, using a patented metal mixed with "diamond-like carbon", "an improved bearing locking arrangement and increased spring force in pod bearing arrangement", as well as increased radial clearance in the bearings, increased cooling capacity and an optimised relocation of vibration sensors..

Carnival lead counsel, Antonio Rodriguez, of Fowler Rodriguez Valdes Fauli, said that these assurances had not been borne out by events. "There has been similarity in the pod problems experienced [onboard *QM2*]," he said. Failures had been particularly marked in the non-drive bearings installed, while electrical problems had also surfaced.

Mr Rodriguez has also been representing RCI in its separate, long-running suit involving Mermaid pods, since 2003. He said that, in the RCI case, he was hopeful for a trial date in 2009. "Rolls-Royce had wanted the case arbitrated, but we have prevailed on that, and now the case is going forward," he said. Mr Rodriguez added that, because a number of "preliminary issues" had been dealt with in the case of RCI, he was hopeful that the *QM2* case could move more quickly to trial.

In general, Carnival's new complaint is that the Mermaids have a defective bearing design and "numerous defective electrical components which render the units subject to constant and continuous maintenance problems and premature repair and replacement of various component parts".

In detail Carnival's complaint says that, while it was led to believe that bearing lifetimes in the *QM2* pods would be 139,000 hours for the radial bearing and 179,000 running hours for the thrust bearings (equating to a minimum of 15-20 years), the reality had been that pod bearings must be changed at a minimum every three years. "In fact, failure of one of the *QM2's* thrust bearings was discovered after less than one year in operation."

According to Carnival, despite earlier representations on having rectified past problems, and less than two years after delivery of the landmark ship, it was Rolls-Royce itself that urged the shipowner to replace all bearings on the *QM2's* Mermaid pods during the ship's drydocking in 2005, with bearings made from a "new, stronger steel material". Examination of the bearings replaced revealed spalling of the "No-Wear" coating on the bearing rollers and indications of electrical current arcing across the bearings, the complaint says. "Also butterfly cracks were discovered in the inner and outer races of the bearings".

The Mermaid podded propulsion system, as installed on *Queen Mary 2*.

While the replacement bearings were touted as the solution for all of these problems, Carnival goes on to say that "all of the problems continued and even progressed after the drydock repairs".

A year later, according to Carnival, and Rolls-Royce was again urging the shipowner to replace bearings "composed of an even more advanced material and design". Again, Carnival took the advice, incurring the cost of the refit and the attendant loss of cruising revenues.

"Examination of the bearings removed during the 2006 drydocking revealed that the thrust bearing Mermaid pod number 4 had failed and would have caused a complete pod failure within a relatively short period of time if it had continued in operation after the drydock," the Carnival complaint says. "The raceway of the bearing was completely cracked with large pieces of metal missing. This bearing had been in service for only one year. Additionally, butterfly cracking, spalling of the 'No-Wear' DLC coating, and damage from electrical discharge across the bearing were again observed."

Rolls-Royce and Converteam again claimed to have addressed the concerns, says Carnival, by increasing the insulation and improving the earthing arrangements. However, "electrical and bearing problems continue to this day".

Also in the 2006 drydocking, cracks were seen beginning to form in the exciter frames where they connect to the pod housing. Carvinal says: "Converteam acknowledged that there is a problem with cracking in the exciter frame, but refused to recognise that the problem is due to deficient design and refused to redesign a new exciter frame suitable to withstand the stresses found within the Mermaid pods". As a result, additional supports were welded to the exciter frames during port calls as a temporary measure, but these welds repeatedly failed due to "extremely difficult working conditions within the pods".

After the 2006 drydocking, another problem surfaced, involving cracking and breaking of damper bars.

In summary, the shipowner says that it has been obliged to drydock the QM2 every two to three years to replace bearings and inspect for other problems, rather than to implement a standard five year drydock schedule.

It will now be up the Florida courts to decide whether these events can be attributed to the willful and/or negligent actions of the Mermaid consortium, as Carnival alleges.

A Rolls-Royce spokesman said simply: "Rolls-Royce rejects the claims made by Carnival and will defend the action. We will not be making further comment as the legal proceedings are continuing." *NA*

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The virtues of diversification

Latest delivery for emerging Indonesian tanker giant, BLT.

Tanker specialist PT Berlian Lau Tanker (BLT) has taken delivery of a string of newbuildings this year as part of its long-term diversification strategy designed to spread the financial risk during the type of downturn currently facing shipping.

The carrier now operates a fleet of some 90 chemical, oil and gas tankers. The purchase of Chembulk Tankers for $850m in late 2007 opened up the lucrative US market for the Indonesia-based company, and BLT has also been expanding outside its traditional chemical and oil tanker markets by buying up gas carriers.

BLT now operates 12 of the latter and has six more on order with deliveries slated for 2009-2012. Recent additions include *Gas Natuna*, a secondhand gas tanker with a total capacity of 3,500m^3, and the 9,000m^3 capacity *Gas Sumbawa*, which was delivered from STX Shipbuilding's Busan facilities in South Korea last July.

However, despite the investment in gas carriers and its fleet of 14 oil tankers, chemical tankers remain the key to BLT's commercial strategy. The company now claims to be the third largest chemical tanker operator in the world with some 60 vessels on its books ranging in size from the 1376dwt *Dewi Madrim* built back in 1987, to the 40,354dwt *Gagarmayang*, which was delivered in 2004.

Most recently, BLT took delivery of *Royal Floss* - a 19,600dwt chemical tanker with high grade specification stainless steel and an IMO II/III classification - from Sekwang Heavy Industries, located in Ulsan, South Korea, a yard that has rapidly developed a reputation for building specialist tankers.

The double-hulled ship has an LOA of 149.6m and at its most extreme point is 24.2m wide. Keel to masthead, the vessel measures 41.3m, bow to centre manifold registers at 71.5m, and parallel body length at summer dwt is 78.5m.

Weight-wise *Royal Floss* comes in at 6106 net tonnes, boasts gross tonnage of 12, 560 tonnes, a suez net tonnage of 11,404 tonnes and a panama net tonnage of 10,555 tonnes.

The tanker has been certified as compliant with the latest edition of the OCIMF 'Recommendations for Oil Tanker Manifolds and Associated Equipment', and has 18 cargo connections per side, each of 150mm.

400mm separates cargo manifold centres, with a further 4600mm distance between the ship rails to the manifold and 2700mm from the centre of the manifold to the main deck. Manifold connections are located 5.5m above the waterline at loaded summer deadweight, a distance that rises to 10.26m in normal ballast.

The capacity of *Royal Floss*' slop tanks at 98% usage was measured at 762m^3, while total capacity, again at 98% but excluding the slop tanks, was rated at 20,836m^3.

Cargo and slop tanks have been fully coated with Marineline 784, which supplier Advanced Polymer Coatings (APC) specifically markets at the chemical tanker sector.

The patented Siloxirane 784 polymer used in the product has some 28 functional groups per molecule, offering more chemical resistance than phenol epoxies, stainless steel and zinc, according to APC. The company claims this is because of the 784, largely ether, cross-links generated, and that the high concentrations of hydroxyl groups prevent the formulation of ester groups, which are subject to hydrolysis and acid attack.

Royal Floss' inert gas system is fuelled by a nitrogen generator and cargo heating is performed by a deck heater enabling a maximum load temperature of 70 degrees C.

The maximum loading rate per midships for homogeneous cargo is rated around 380m^3/hour/tank.

Centrifugal deepwell framo cargo pumps capable of handling 200m^3/hr, while a vapour emission control system, and high level alarms in cargo tanks round out the design.

BLT was unable to supply any information on the engine or propulsion systems fitted on *Royal Floss*, but did point out that either IFW 380CST or MDO could be used to fuel the main propulsion system and generating plant.

Unlike most of the company's fleet which is flagged in Hong Kong, Singapore or Indonesia, *Royal Floss* has been flagged with the Panama Registry. It is crewed primarily by Koreans and P&I insurance has been purchased from Gard. *NA*

Floating crane selection

An approach for multi-purpose floating crane selection in transhipment operations. Article by *Dr. Anatoliy Novikov, Ukranian Maritime Institute, Sevastopol, Ukraine, and **Dr. Robert Latorre, MRINA, University of New Orleans, USA.

A Worldwide development and growth has resulted in increased demand for coal, ore, grain and fertiliser. At current prices, export of these commodities from inland sites via river barges becomes profitable in Indonesia, South America and CIS countries like Ukraine. The bulk cargo is loaded into river ships/barges and moved downriver to a suitable deep water (depth>14m) anchorage for off-loading onto 60,000dwt-80,000dwt Panamax size oceangoing bulk carriers.

The bottleneck of the lack of a modern bulk loading terminal in these locations is overcome by fastening a floating crane to the bulk carrier side. The loaded barges are then tied up to the available crane side and the bulk cargo hoisted by the rotating crane into the bulk carrier. During the unloading a tracked bulldozer is lowered into the barge for the last stages of the bulk cargo off-loading. Floating cranes have been successfully used in this operation for several years. The reported throughput ranges between 14,000tonnes/day for a 25tonne floating crane to 22,000tonnes/day for a 36tonne floating crane.

Higher loading rates are achieved using tandem (port/starboard) crane. This arrangement reduces the possible occurrence of adverse hogging and sagging bending moment on the bulk carrier hull structure during loading. This transfer of bulk cargo has been completed in waves with 2.5m heights [2].

Floating crane utilisation

Success of these floating cranes has resulted in long term charter contracts for bulk carrier loading. Nevertheless, these cranes are idle during adverse weather as well as the period between the departure of the loaded bulk carrier and next ship arrival. Since the floating crane is already on site, it is quite feasible to consider operating the crane as a multi-purpose floating crane to complete the required port construction work.

The scope of the multi-purpose floating crane operations in Table 1 include:

- Basic bulk cargo trans-shipment using a crane bucket
- Grab dredging with a reinforced clam bucket
- Rock breaking using gravity or hydraulic hammer
- Pile driving using hydraulic driver
- Pipe laying

By proper coordination of the barging operations, the dredge spoils can be moved out to an environmentally acceptable area using the empty barges. The stones for fill in the breakwater, mooring and pier foundations can be scheduled to arrive as the transshipment operations are completed. The floating crane can be easily positioned using the available tugboats involved with the barge movement.

Floating crane selection

The selection of an appropriate multi-purpose floating crane involves in addition to the choosing the crane lifting capacity L tonne, taking into account differences in the crane throughput w_{crane} in various operating modes (Table 1). As in ship design, the different multi-purpose floating cranes can be compared on the basis of required revenue/tonne R €/tonne. for a charter contract of $Qcrane$ €/year.

$$R = \frac{Qcrane}{Wcrane = \sum_{i}^{n} Wi} \quad €/\text{tonne} \quad (1)$$

where

$Qcrane$	Charter €/year
$Wcrane$	Required bulk trans-shipment (baseline) tonne/year
Wi	Required throughput of different crane operations tonne/year

The second index is the operational utilisation factor, $U\%$. This serves as a check to insure the multi-purpose floating crane is able to complete the desired operations within the charter period.

Defining the time required for each operation as ti:

$$ti = \frac{Wi}{wi} \quad \text{hours.} \quad (2)$$

where

wi	crane operations rate tonne/hour
Wi	Required throughput of different crane operations tonne/year

The utilisation U factor [4] is than defined as:

$$U = \frac{tc + \sum_{i=1}^{n} ti}{aT} x100\% \quad (3)$$

Where

a	time charter period T hour
A	Reduction due to weather, operational
tc	time required for trans shipment operation hours
ti	time required for other operations hours

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**Dr. Robert Latorre MRINA professor of Naval Architecture and Marine Engineering University of New Orleans. Dr. Latorre has authored technical papers on the design and selection of offshore support vessels such as crew boats, tug supply boats as well as liftboats. Contact: rlatorre@uno.edu

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In the multi-purpose floating crane selection, the utilisation *U%* also provides an initial guideline for the work estimate. Obviously floating cranes with lower throughput rate wi will not complete the required work within the charter period *T*.

On the other hand chartering a large capacity crane will result in a relatively low utilisation *U* value. Typically a utilisation *U* value greater than 65% is desirable.

To illustrate this selection process, the following example might be considered. An export company has chartered a floating crane for bulk cargo transhipment from barges to ocean going Panamax bulk carriers. In the current three year charter period, 7.5 million tonnes of bulk cargo has been transhipped. Using a floating crane rated at 600tonnes/hour this transhipment was done in 4167hours/season during the nine month period/year (6570hour).

Typically, the floating crane loaded a 70,000dwt Panamaz bulk carrier in 117hours (5 days). This corresponds to a floating crane utilisation $U = 63.4\%$. The reason for the nine month (α=0.75) operating period is the seasonal high waves.

The export company plans to improve the loading conditions by constructing a 1000m x 4m x 15m deep stone breakwater. This involves the transhipment and the floating crane work in Table 2. The particulars of three candidate multi-purpose floating cranes are summarised in Table 3. The selection calculations are done on a spreadsheet. This is the reason the utilisation *U* is adopted here. It readily identifies the unacceptable floating cranes such as crane A with $U = 102\%$ that have throughput rates wi too low for the required work.

The selection of Crane B or C will involve a degree of project schedule risk tolerance. Crane C has a 3.5 week (596hours) margin compared to the 1.5 week (250hours) margin of Crane B. The other consideration is that midway into the charter period, a segment of the breakwater will be in place. Loading in this partially sheltered anchorage should reduce the wave influence on the transhipment operations. This will translate into additional days for completing the multi-purpose floating crane operations. *NA*

No	Task	Description	Index	*wi* Range
1	Transhipment	Bulk cargo from barge to ship	tonnes/hour	500-600
2	Grab Dredging	Soil removal and deposit in barge	tonnes/hour	250-300
3	Rock Breaking	Seabed rock breaking and removal	tonnes/hour	150-200
4	Pile Driving	Foundation and mooring piles	pile/hour	15-25
5	Pipe Laying	Connecting and laying subsea pipe	m/hour	150-250
6	Module lift	Construction module placement	tonnes/hour	100-200

Table 1: Typical 20-25tonne multi-purpose floating crane operations.

No	Item	Requirement	Est rate	Est. time hours
0	Trans-shipping	2.5 million tonnes	600 tonnes/h	4167 hours
1	Dredging	205,000tonne	250-350 tonnes/hour	586-820hours
2	Rock breaking	150,000tonnes	150-250 tonnes/hour	600-1000hours
3	Pile driving	30 x 5 pile cluster	5-10 pile/hour	15-30hours
4	Rock fill	420,000tonnes	450-550 tonnes/hour	764-933hours
	Total			6132 -6950 hours
	Utilisation	6570 hours basis		93.3%-1.06%

Table 2: Combined transhipment and breakwater crane work, for example.

No	Item	Required	Crane A *wi* (hours)	Crane B *wi* (hours)	CraneC *Wi* (hours)
	Lifting capacity	Tonne	25	27	30
	Charter Fee	*Qcrane* €	2.2 million	2.4 millon	2.5 million
0	Trans-shipment	2.5 million tonne	600 (4167)	620 (4032)	640 (3906)
1	Dredging	205,000 tonne	275 (745)	300 (683)	350 (586)
2	Rock breaking	150,000 tonne	180 (833)	200 (750)	225 (667)
3	Pile driving	150 piles	10 (15)	10 (15)	10 (15)
4	Rock fill	420,000 tonne	475 (884)	500 (840)	525 (800)
	Total		6644	6320	5974
	Utilisation	6570 hours base	102% unacceptable	96.2% acceptable	92% aceptable
	Required Revenue	Total* 3016250tonne	N.A	0.80 €/tonnes selected	0.83 €/tonnes

Table 3: Main particulars of the candidate multipurpose floating cranes.
*Note: for tonne estimate 1 pile = 275tonnes 150 piles = 41,250tonnes.


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Feel it coming in the air

Ship technology company DK Group has just concluded the first stage of full-scale sea trials on the 2550dwt, 83m *ACS Demonstrator*, which features a ground-breaking energy-saving air cavity system integral to her hull.

First trials of *ACS Demonstrator* have been conducted in association with Germanischer Lloyd, FORCE Technology and Lyngsø Marine (part of SAM Electronics).

The landmark trials bring to US$20 million the amount that DK Group, registered in The Netherlands, has invested in developing its patented air cavity system (ACS) technology, which is designed to inject air into specially designed hulls to reduce the friction between the hull surface and water. A layer of air is generated between the hull and the water, allowing the vessel effectively to 'glide'.

In some ways, *ACS Demonstrator* is a 1:4 seagoing scale model of a VLCC. According to DK Group, in its full scale form, ACS technology would reduce a vessel's fuel consumption by up to 15% and CO_2 emissions by up to 15%, providing huge cost savings for shipowners and reducing the shipping industry's impact on global warming. It reckons the ACS market is worth up to US$60 billion based on the technology's relevance to the commercial fleet of ocean-going vessels. "Shipowners will recoup the costs of ACS in between two to five years depending on the vessel type," the system's developer says.

The arrival of *ACS Demonstrator* follows a decade of testing of the ACS concept, involving some 70 tank tests. The basic idea is that a compressor mounted at the bow end of the ship, demanding only 0.5% of the ship's overall power, drives air into a cavity extending along the hull bottom. The ACS features its own automation to control air delivery, with sensors able to measure the water level inside the cavity, and also able to react immediately to the escape of air, and to keep the water level constant despite the movement of the vessel.

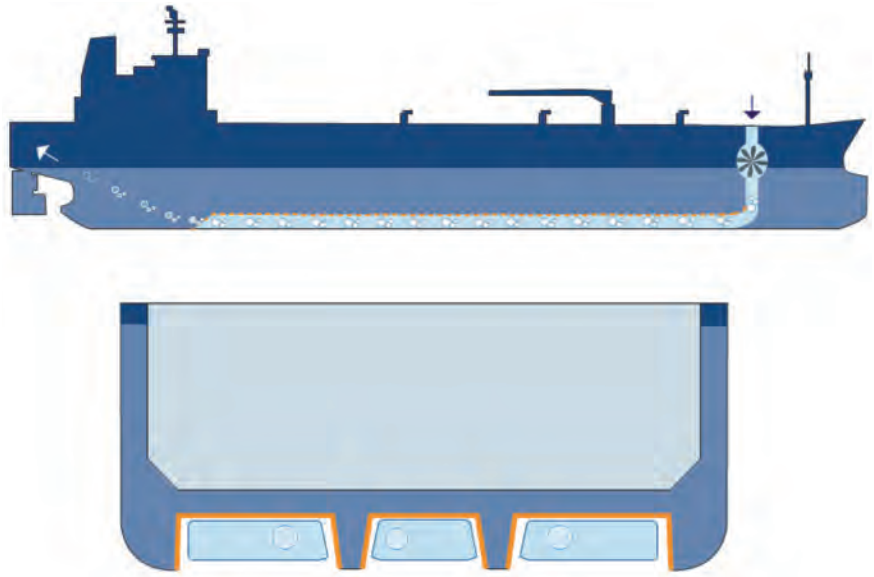
Constructed in 1975 at Germany's Sietas yard, *ACS Demonstrator* was converted earlier this year at the Gryfia repair yard in Poland to demonstrate the ACS concept and to generate confidence in scaling up the concept from model proportions.

Four parallel air cavities have been inserted along the double bottom of the ship's cargo area. According to DK Group naval architect, Johannes Johannesson, at 2m high, the cavities are "somewhat deeper" than would ultimately have been necessary for a ship of this size, because the developer needed to install cameras and other monitoring equipment. He also noted that in a full scale version, cavities would extend along a much longer section of the ship's double bottom. In the case of a 333.3m length overall VLCC,with a moulded breadth of 59.9m, and a deadweight of 280,000tonnes, for example, the area covered by the ACS would amount to 9000m^2.

Such cavities entail additional shell plating and floor plating, but the weight increase when compared to a conventional vessel is said to be marginal.

After initial tests in transit with a full load between Sczecin and Oslo, sea trials

ACS Demonstrator, the first vessel to feature ACS.



The principle of the air cavity system.

took place in Oslofjord in early December, amounting to speed trials in calm water and in waves, and manoeuvring tests.

"We were happy with the results," said Mr Johannesson, without giving quantative data. "The reduction in friction was as we expected. The main issue was the performance of the cavities. As expected, we confirmed the values we had been using in our previous evaluation. Secondly, we can say that the cavities performed better in the case of the real vessel than in the model tests, because the vessel was sailing at higher (equivalent) speeds than was the case with the model, although the Froude numbers were the same. The automation system from Lyngsø also performed very well."

But, this is by no means the end of the story. In September 2008 it was announced that DK Group's ACS technology would be integral to a project to develop an energy-efficient 200,000dwt bulk carrier in concert with Germanischer Lloyd (GL).

Such a ship would be around 300m long, 55m across the beam, feature a maximum draught of 18m and achieve 15knots.

For the past two years DK Group and GL have worked together to develop ACS technology with Danish technology company FORCE Technology. GL has endorsed ACS technology with official systems certification following seven years of development and the years of tank testing. As part of the new project, GL says it will continue to provide technical advisory services and accompanying analyses of strength, dynamics and hydrodynamics for DK Group, while a 3-D finite element (FE) model of the hull and deckhouse structure will be created, forming the basis for subsequent global strength analysis. Additionally, the analysis of wave load cases, the selection of design load, and the calculation of overall hull deflections and stresses for design load cases will be performed.

According to Dr. Pierre C. Sames, GL senior vice president strategic research: "For this newbuilding project, the focus will not be solely on air lubrication. Various innovations, such as slow-running propellers, exhaust-gas scrubbers, optimised steering gear and improved lines are also to be included."

DK Group founder Jørn Winkler, said that, as well as the energy savings flowing from ACS, DK Group was looking to exploit other established means of fuel saving, including the use of twin propellers/twin engines (to reduce fuel burn by 5%-10%), the use of contra-rotating propellers (a 10% improvement, depending on the relation between the main engine and the thruster), propeller boss fins (fuel savings of approximately 4%), a heat recovery system (saving 7%-12% of fuel) and the use of high efficiency propellers (citing the Kappel propeller as saving 4% in fuel).

Mr Johannesson said that DK Group currently also favoured exploiting excess air generated in a ship's turbocharger as one means of feeding its ACS. He added that, if all of the attributes envisaged were combined in a single newbuild, owners could expect to achieve significant efficiency gains. *NA*

Emissions are a drag

As one of several projects aimed at reducing green house gas emissions, BP Shipping has been investigating the possibility of reducing the wind drag of future newbuild vessels.

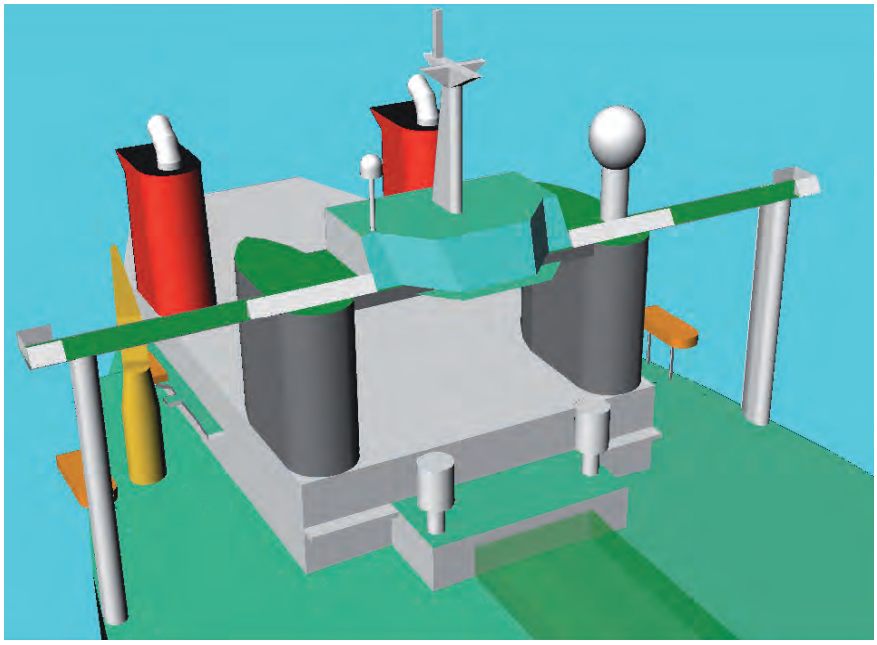
BP has been pursuing a number of research projects since 2006 that aim to reduce the contribution made by ships to greenhouse gas emissions by as much as 10%. These include investigations into the impact made by trim optimisation, hullform optimisation via parametric studies, wind and solar power generation, hydrogen fuel cells, weather routings, volatile organic compound re-absorption (using the Venturie system), and wind drag reduction.

Wind drag is believed to account for only three to five per cent of a vessel's total drag, the rest being associated with water drag. To make an appreciable reduction in total drag, and thus cut emissions, BP set itself an ambitious target to reduce wind drag by 25%.

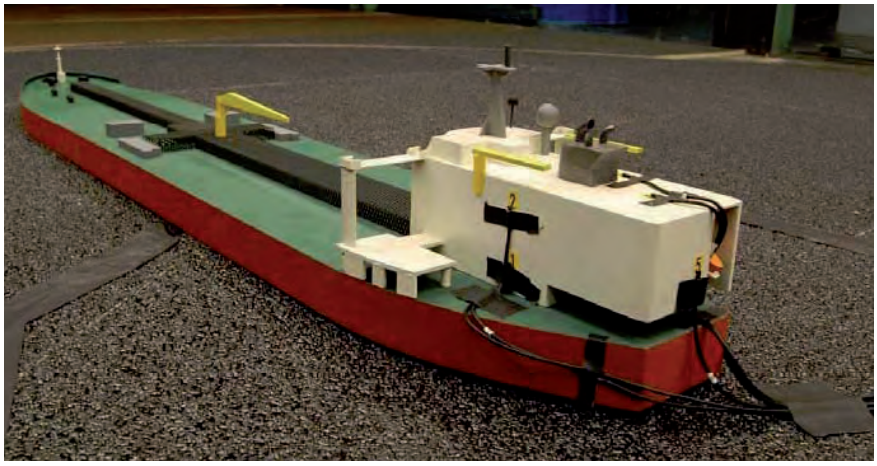
A handful of ship operators have looked at reducing wind drag through minor modifications, such as removing bridge wings, but in the overwhelming majority of ship designs the deckhouse and engine casing are configured for ease of construction, with little thought given to wind drag.

It would have been very easy to design a new deckhouse that reduced wind drag by 50%, but such a module would either be totally unworkable or uninhabitable. Instead, working with BMT Fluid Mechanics, BP set itself clear criteria to ensure a practical design was produced, namely:

1. internal area of the deckhouse and engine casing to remain unchanged.
2. vertical position of wheelhouse to be maintained.
3. bridge wings to be kept.
4. exhaust dispersion from funnel to be good and resulting gas concentration levels in working areas to be within the limits of appropriate British Standards.



VLCC 'Flying Bridge' concept. Note inclined-aft bridge windows. Tear-drop structures support the wheelhouse and contain stair towers.



'Long and Thin' concept being tested in wind tunnel to measure wind drag and exhaust dispersion.

The size of a deckhouse and engine casing on a ship does not vary greatly whether the ship is a 37,000dwt product carrier or a very large crude carrier (VLCC) because, whereas the hull sizes vary significantly, crew complements are similar.

Three BP vessel sizes were investigated to see how the optimum superstructure design changes with vessel size - the E4, 37,000dwt MR tanker, the Bird class Aframax tanker and the P class VLCC.

First, wind tunnel testing was carried out at BMT Fluid Mechanics in Teddington, London. Testing as-built designs, the magnitude of their wind drag was recorded. Next, Computational Fluid Dynamics (CFD) models of the as-built hulls were constructed and wind drag forces compared with those

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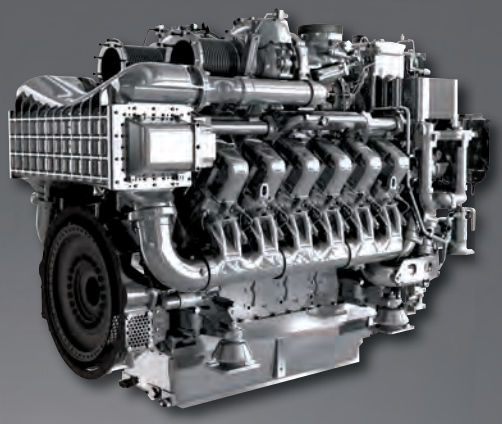

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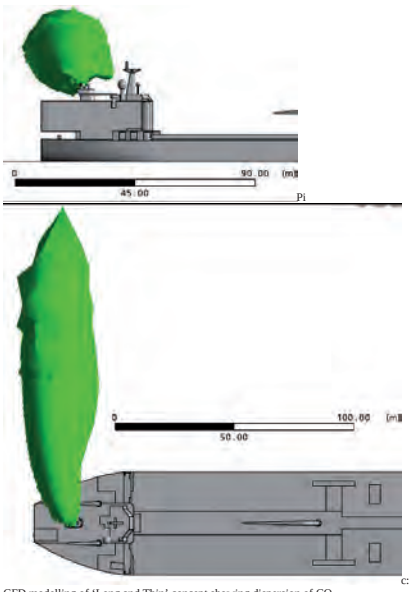


CFD modelling of 'Long and Thin' concept showing dispersion of CO_2.

of a number of deckhouse concepts. Once the best concept had been found, further tweaking of the design was carried out to reduce drag further.

Conceptual thinking

The concepts tested included a long-thin deckhouse design, a vertically chamfered design, an inclined design and a flying bridge concept.

In the case of the 'long and thin' concept, the deckhouse and engine casing were connected, with the whole superstructure being extended aft over the mooring deck, in order to minimise the frontal area. All concepts involved the removal of external stairways to reduce wind drag, maintenance and improve security.

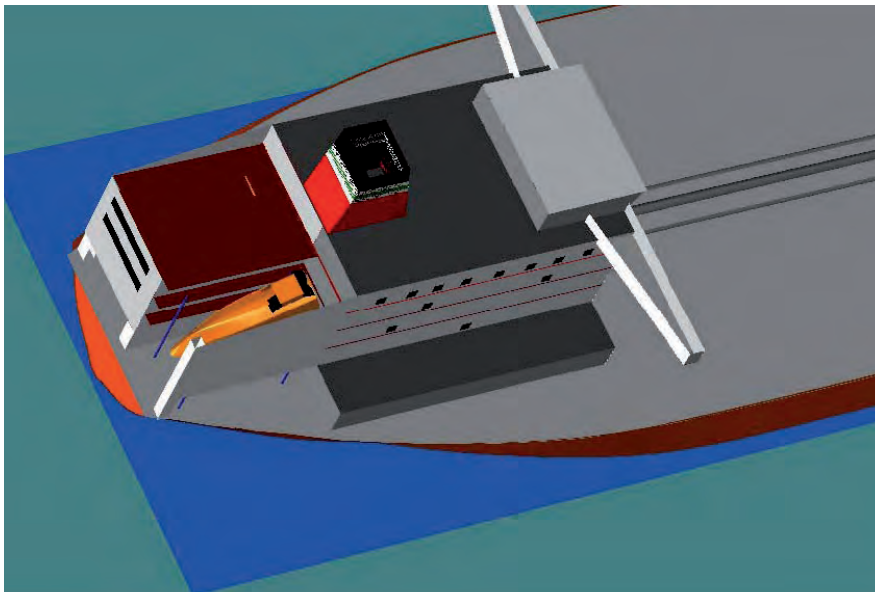
Jonathan Bailey, naval architect at BP Shipping, said: "In each of the concepts, we ensured the total internal volume of the deckhouse was the same as the existing accommodation arrangement through an iterative design process. This ensured the concepts did not penalise the crew accommodation standards that are so important to BP Shipping.

"The volume 'lost' due to chamfering the front corners of the deckhouse, or by inclining the forward bulkhead, was regained by joining the deckhouse and engine casing and removing the more traditional cross passageway that is normally positioned between the two superstructures."

For the chamfer design, the angle of the chamfer was set at 45 degrees and the design consisted of splitting the width of the superstructure into three, with the central third flat, and the outer thirds chamfered.

Initial data indicated that, by deploying a 'long and thin' deckhouse alone, a 16% reduction in wind drag would be achieved. The 'chamfered front' alone would achieve a 10% reduction, while the inclined deckhouse would achieve a seven per cent reduction.

Rendering of 'Long and Thin' concept showing accommodation extended aft over mooring deck and protected location of lifeboat.



Combined with other refinements, these designs were subsequently optimised using CFD, modelling, with the tweaking including: reducing funnel heights; streamlining bridge wings and supports; inclining the bow bulwark; aligning deck cranes longitudinally; and inclining bridge windows.

Taking all of these refinements into account, the final models were built and tested in the wind tunnel to get precise measurements for wind drag and also check the exhaust dispersion.

The CFD testing indicated likely reductions in wind drag of between 30% and 35% with good exhaust gas dispersion - these results were later confirmed in the wind tunnel. This equates to an approximate saving in the vessel's total drag of around one per cent.

It was expected the different vessel sizes would result in largely varying possible reductions in wind drag. In reality, the reductions in wind drag were virtually the same from 37,000dwt MR to VLCC. The likely reasons for this are that on an MR there is little room to significantly reduce the frontal area of the deckhouse and therefore wind drag. For the VLCC, however, the deckhouse significantly frontal area can be reduced as it is a much smaller proportion of the vessel's total frontal area.

At fuel prices prevailing as of mid-2008, this equated to more than $100,000 per year per ship for an Aframax Bird class vessel, in excess of $150,000 for a P class VLCC and more than $53,000 for an E class 37,000dwt ship. While fuel prices have subsequently slipped, cost savings remain significant.

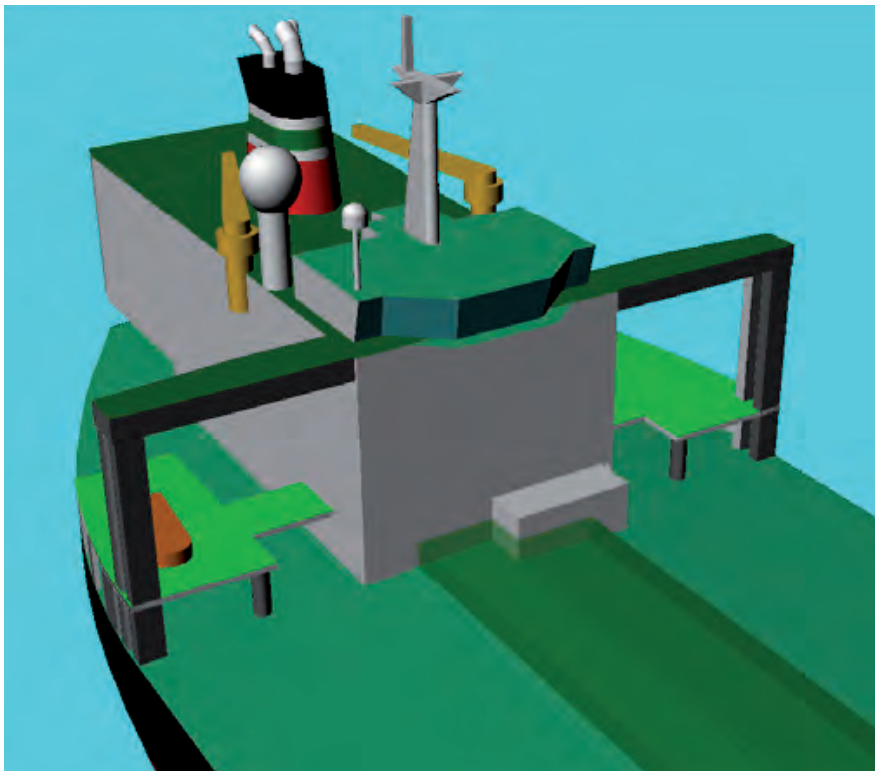
However, the purpose of the project was not just to look for cost savings but to achieve reductions in green house gas emissions. In this case, reductions in carbon dioxide (CO_2) emissions per year would equate to around 280 tonnes in the case of the 37,000dwt ship, 530 tonnes in the case of the 115,000dwt Aframax ship, and 780tonnes in the case of the 300,000dwt VLCC.

Building prospects

Currently the impact on the build cost of these vessels is not known. Newbuild prices are not necessarily linked to the actual cost to build the ship, but rather what the market can withstand. .

According to James Collett, naval architect and project leader of the wind drag reduction project: "With shipyard orderbooks full for the next few years, persuading a shipyard to change their normal designs to incorporate these concepts would likely be very difficult and expensive". He adds: "This is a position consolidated by the fact that shipyards tend to subcontract deckhouse work to third parties. However, should orderbooks ease, the cost savings associated with these low-drag designs may be able to offset any increase in building cost. Should carbon trading become a reality worldwide, the economic benefit of these green house gas reducing designs will become even more compelling."

Added to the economic and environmental benefits, the long and thin concept (the most successful concept) also provides other benefits by way of providing a safe, internal, fire-protected access to the freefall lifeboat, greater external wall surface for the same internal volume meaning more possibility for windows and an improved standard of accommodation, and, finally, the deck machinery on the aft mooring deck is more protected from the elements possibly reducing maintenance requirements. *NA*



CFD rendering of 'Long and Thin' concept

Four ro-ro options from FKAB

FKAB is refocusing on a new concept for an environmentally-friendly ro-ro vessel.

FESC, the FKAB Environmental Ship Concept, sees the Swedish naval architecture company emerging with a new design for a 3250-4600 lane metre ro-ro carrier, with sustainable technology at its core. The market swing towards Capesize bulk carriers temporarily diverted FKAB's attention from the project but, with new IMO regulations pending on fuel emissions, and a fall in orders apparent in the bulk carrier market, FKAB has returned to the FESC project with renewed vigour.

FESC is a ship concept based on available and proven technology, aiming to combine low emissions to air and sea with acceptable or good economical performance across the entire life cycle of the vessel. It is based on the FKAB R13 ro-ro design, envisaging a twin skeg, fully redundant, stern loader; with several load designs in the range from 3300 to 4600 lane metres. The idea is that the green technology used on such a vessel could be applied to larger vessels in the future.

The vessel would feature an overall length of 199m with a length between perpendiculars of 188m and a moulded breadth of 29.4m. It would be capable of 22knots, with a choice of four engine concepts up for consideration.

The four engine types have been classed as 'Basic'(Baseline FKAB ro-ro R13 design with HFO fuel), 'Premium'(FESC ro-ro; low sulphurHFO fuel and a selective catalytic convertor system), 'Super': (FESC

The original R13 ro-ro design that FESC is based on.

FESC: The concept ship design from FKAB that potentially could cut all emissions.

TECHNICAL PARTICULARS

FKAB ESC vessel

Length, oa	199m
Length, bp	188m
Breadth	29.4m
Depth, moulded to upper deck	18.2m
Depth, moulded to main deck	9.4m
Draught, scantling	7.5m
Draught, design	7m
Tank capacity LNG	1500m³
Tank capacity HFO/MGO	1500m³
Marine Gas Oil, Basic, Premium, Super versions	30m³
Water Ballast	6200m³
Fresh Water	300m³
Deadweight, design draught =7m, S.W	11,700tonnes
Deadweight, summer draught =7.50m, S.W	14,000tonnes
Deck loads, deck 1 – 5 (SECU and cassettes)	80tonnes
Deck load, deck 6 (weather deck):(Trailers)	27tonnes
Speed	22knots
Range Basic, Premium and Super Versions	16 days
Range Ultra Version	8 days
Main engines Basic, Premium and Super Versions.2 x 13,850kW	
Main engines Ultra Version	.4 x 7000kW
Aux engines	.3 x 900kW

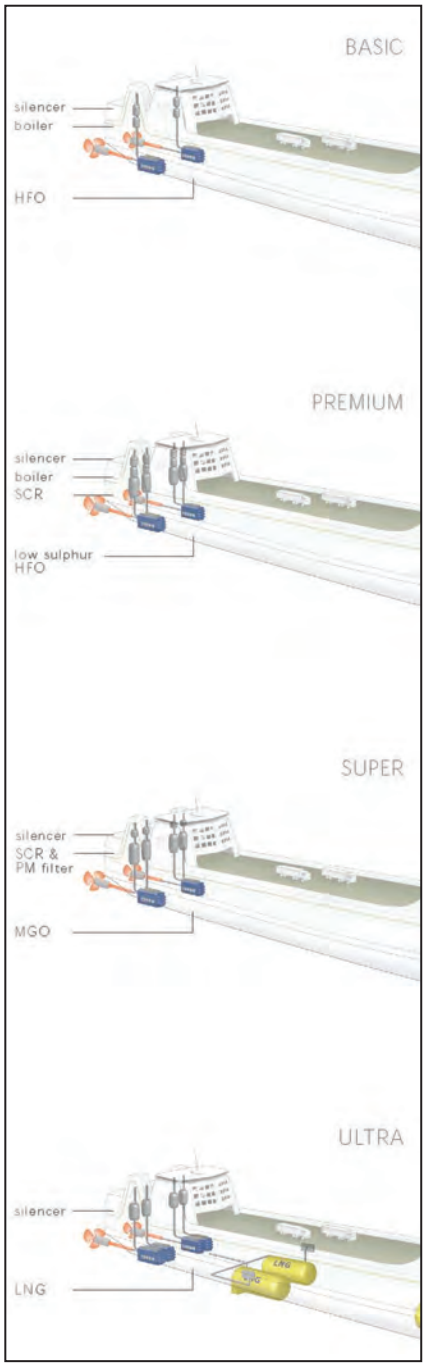
ro-ro; marine gas oil fuel, SCR system, plus particulates filter), 'Ultra':(FESC ro-ro; liquefied natural gas power system).

The Premium engine solution would undoubtedly reduce SOx emissions, but it is worth noting that the solution requires space in the funnel trunks to fit the SCR unit and gas boiler, and that this type of fitting would also take up valuable cargo space. Furthermore, LSHFO availability and price remain key issues.

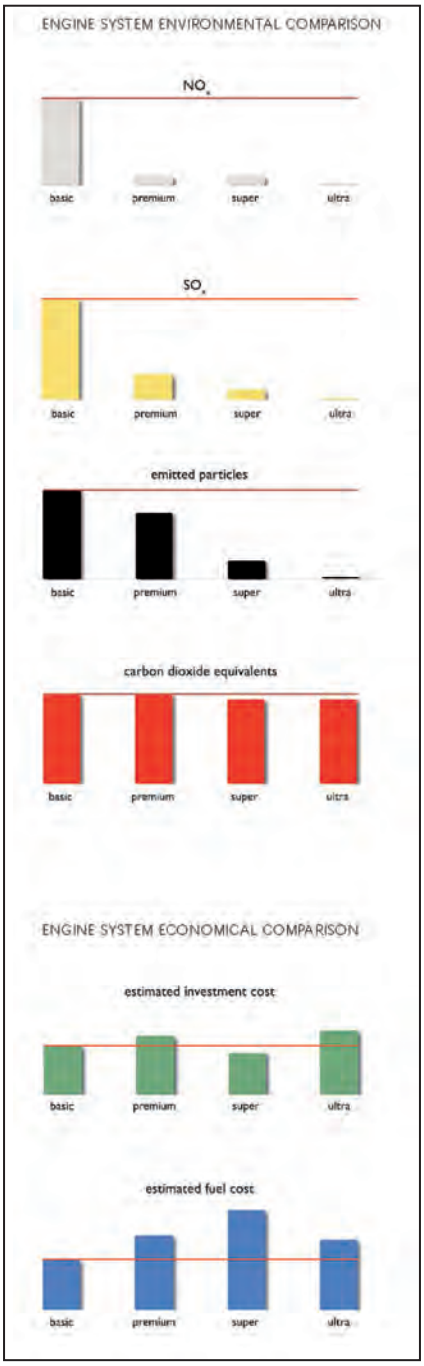
The alternative Super engine system would use MGO fuel, which is cleaner than HFO, with most emissions being reduced and separation not necessary. The sulphur and particulate content that is produced is lower due to the fuel having a lower viscosity and its not having to be heated in the process.

The fourth option is the LNG engine arrangement, offering the best green solution - lowering NOx, SOx and PM emissions when compared to other fuels. However, one drawback, according to FKAB, surrounds the methane leak that has been discovered to occur when operating these types of engines. This has been reported at one per cent, or 20 times worse than CO_2 in terms of being a greenhouse gas, potentially just as damaging to the environment as emissions from diesel fuelled engines .The leak or "slip" as it is referred to comes from bad combustion in the combustion chamber.

Johan Algell, head of project and marketing at FKAB said: "The shipping industry has time to fix this as it is now aware of the problem". If this problem can be resolved and LNG engines made as clean as initially thought, the main problem will only be the handling and storage of the fuel of the Ultra version arrangement for FKAB, as it will need to be kept at a temperature below -160degrees C and handled in special piping. The Ultra version will be equipped with cryogenic tanks; cylindrical and pressurised at 6bar and a cool box to take care of the regasification process. This system is already in operation today on approximately 15 vessels, with future plans of replacing HFO with LNG as the main fuel for a handful of vessels used in the Baltic. However, a challenge remains as to what type of ship LNG will prove appropriate for, with an eight day running time suggesting that only shortsea vessels will be eligible. To increase the running time to 16 days, available lane metres would have to be reduced from 3300 to 3250.



The four different engine arrangements for the R13.



Comparisons of pollutants for the four different versions of engine arrangements.

Shoreside power

Options to reduce emissions further also include alternative energy sources when the ship is in port, with two possible solutions being shore based natural/ bio gas or shore supplied electricity. The added benefit of this would be that if the vessel was to be powered by LNG this would mean that the LNG coming from the shore supply could be reheated and regasified before it goes to the engine. An added benefit of this process is that the auxiliary engines powered by the natural/ biogas would generate no greenhouse gases as biogas fuel is CO_2 neutral. *NA*

A little ray of sunshine

A pure truck and car carrier due delivery in Kobe is the world's first operational cargo ship that will use solar power to contribute to its propulsion.

Nippon Yusen Kabushiki Kaisha (NYK) said that, as part of corporate efforts to reduce CO_2 emissions on its ocean-going vessels, it had reached an agreement with Nippon Oil Corp to develop a system that would use solar power as part of the means of a ship's propulsion. Toyota Motor Corp has agreed to support this initiative as a shipper in order to reduce CO_2 emissions from the ocean transportation of finished cars.

Photovoltaic panels as they will look onboard the MHI-built PCTC.

For the moment, the sun's contribution will be small, with the solar power generator fitted onboard a Mitsubishi Heavy Industries, Ltd-built 6400 car capacity PCTC, due delivery in late December 2008, featuring 328 solar panels covering around one quarter of the ship's open deck, but producing just 40kW of power (gross). Main diesel engines onboard car carriers of this capacity commonly generate around 13,240kW of power.

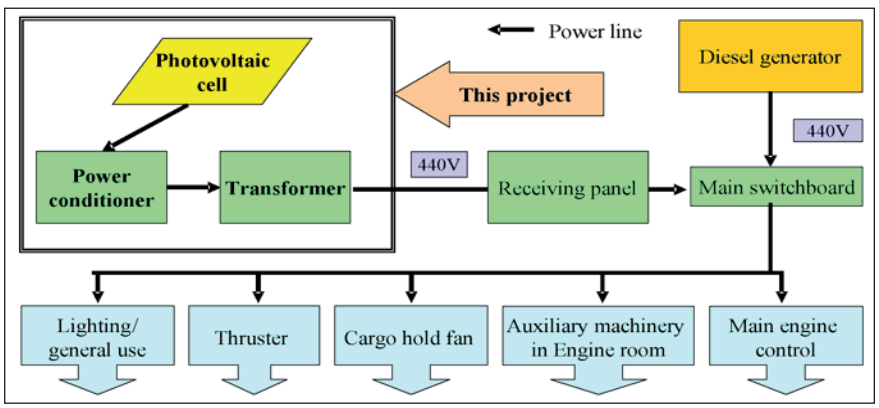
Nonetheless, solar power will supplement existing power production, connecting to the onboard 440V electrical network. Some estimates suggest that the installation will reap CO_2 reductions of up to 2% per year.

NYK emphasised that it viewed the installation as the first step to towards the commercialisation of solar power as part of mainstream ship operations. The step should be seen against a backdrop of intensifying pressure on companies worldwide to combat global warming. "NYK engaged in the research and development of next-generation eco-friendly ships including technologies to utilise recyclable energy for all aspects of ocean transportation," the shipowner said. "On the other hand, Nippon Oil as a leading global total energy solutions company, has been working to cultivate the market for solar photovoltaic power generation systems, and has continued the development of related new products."

To date, the installation of solar power generators onboard ships has been limited to use within crews living areas.

NYK said that the latest equipment would need to be tested to analyse the durability of solar photovoltaic modules in the harsh shipboard environment, to assess how larger-scale systems might be optimised and to demonstrate the capability of reducing CO_2 emissions. *NA*

Solar power contributing to propulsion.



Ecotech offers environmental solutions

Wärtsilä will launch a new centralised environmental products know-how unit this month.

Delivery Centre Ecotech (DC Ecotech) is being set up specifically to develop and deliver environmental technologies, as well as products for emissions reduction and efficiency improvement.

DC Ecotech will be a global unit within Wärtsilä and will be headed by Juha Kytölä, president of Wärtsilä Finland, and currently also vice president, Delivery Centre Vaasa, Finland.

Explaining the reasoning behind the initiative, Mr Kytölä said: "Wärtsilä has many years of experience in delivering emissions reducing equipment for the exhaust stream of its engines, both in land based power plants and ship installations. Common to all these deliveries is the fact that they are tailor made for each specific installation. DC Ecotech will focus on both the further development of these technologies, as well as a portfolio of products that can be produced in volume."

Wärtsilä pointed out the way that tighter emissions legislation has been having an impact on both the shipping and power plant sectors. The International Maritime Organization's (IMO) Tier II requirements stipulate a 20% reduction in nitrogen oxide (NOx) emissions from current levels by 2011, while the Tier III requirements, which come into force in 2016, demand an 80% reduction from today's levels in selected areas. Sulphur oxide (SOx) emissions are also to be significantly reduced. There is also an increasing global focus on lowering CO_2 emissions, and discussions regarding limitations in this area have already started.

While Tier II limits are achievable by developing existing engines, through the application of common rail electronic control and the use of advanced turbochargers that operate at higher charge air pressures, Tier III will demand the further development of a new selective catalytic reactor (SCR) unit system for gas engines, as well as the validation and design optimisation of the recently launched NOR (Nitrogen Oxides Reducers) SCR unit. Current work is focusing on developing a standardised SCR for volume production.

Juha Kytöla, president, Wärtsilä Finland, will head up the company's new 'Delivery Centre Ecotech' unit, focusing on developing environmentally friendly technologies in the run up to IMO Tier III implementation.

Developmental work also continues on a combined marine scrubber and exhaust gas module to meet SOx emissions limitations, where the company's offering is distinguished from other products in the market by virtue of its enclosed nature, using sweet water to scrub the gas, where others draw on sea water. Mr Kytöla said that Wärtsilä had been running tests of its first shipboard scrubber, attaching it to an auxiliary engine on the Neste oil tanker *Suula* over recent months. He said that the main area of focus for the tests was to establish the scrubber's durability in a shipping environment.

Klaus M Helm, Wärtsilä Industrial Operations vice president, global research and development, offered an update on Wärtsilä's work to develop shipboard fuel cells, where he said considerable market potential existed for the application of the technology to auxiliary engines. As has been reported in the past (*The Naval Architect*, January 2008, pp88-89), a first shipboard installation is under test on a Wallenius car carrier, with Wärtsilä working in conjunction with Danish partner Topsoe to deliver a solid oxide fuel cell .This solution consists of a cathode, an electrolyte and an anode, wherein oxygen and fuel (either methanol or methane) are caused to react at the cathode and the anode, respectively. The solid oxide electrolyte conducts oxygen ions but not electrons, thereby creating an electrical potential difference, which drives an electrical current.

While the first shipboard unit generates only 20kW of power, Mr Helm said a 50kW unit was already in mind, and that there was a target to develop a fuel cell capable of turning out 500kW. He conceded that such a scheme would depend on Wärtsilä's ability to develop more compact units that were more cost efficient. "The price per kilowatt from fuel cells is still quite a bit higher than is the case for a diesel or gas engine," he said.

A waste heat recovery concept and carbon dioxide capture and storage technology are also known to be under development. *NA*

Green lubes get green light

MAN Diesel's Alpha propellers are ready for bio-oil operations.

After comprehensive testing, MAN Diesel said it had given general approval for the use of Vickers Oils bio-oils with its controlled pitch propellers. Accordingly, Vickers biodegradable and non-toxic oils are now accepted by MAN Diesel for use within complete oil systems in the VB and VBS propeller range.

As such, Vickers bio-oils can be used both for the general gravity lubrication of sterntube bearings, and the lubrication of propeller hubs' moving internal parts.

Jens Ring-Nielsen, senior manager for MAN Diesel Propellers, Gears & Aft-Ship Systems, said: "We are very pleased with the test results experienced with Vickers bio-oils. Today, we are the first company able to offer our customers the opportunity of using environmentally-friendly, biodegradable oils in their CP-propeller systems".

From left, Peter J.F. Vickers, chairman and managing director of Vickers Oils, Jens Ring-Nielsen and Kenneth Boesen (project manager) of MAN Diesel.

The oils have the Vickers trade names HYDROX BIO 68 and HYDROX BIO 100. Additionally, another Vickers bio-oil is presently being tested for use with MAN Diesel's AMG-range of reduction gearboxes, and as hydraulic servo-oil for propeller pitch-setting.

The 'bio-lubricated' VB and VBS propeller range covers the power range from 1000kW to 30,000kW - and hub series from 480mm to 1940mm in size. This corresponds with propeller diameters in the range of 1.8m to 8m.

More than 600 vessels worldwide now use HYDROX BIO as their sterntube oil. In addition to being readily biodegradable the HYDROX BIO grades are also non-toxic to marine life throughout the food chain. *NA*

SkySails have lift off

Hard on the heels of securing a first order from a Norwegian company for its towing type propulsion system, Hamburg-based SkySails has found itself a powerful and eye-catching strategic partner, in the shape of Zeppelin Power Systems.

Bergen-based Wilson ASA has become the first Norwegian shipping company to order SkySails propulsion, with installation due on the combined heavylift/bulk carrier/container carrier *Wilson Grip* in 2009.

"Wilson has high expectations that SkySails on *Wilson Grip* will prove to be an environmental and economic success for further Wilson vessels," said Oyvind Gjerde of Wilson ASA. Shortsea specialist Wilson operates a fleet of some 110 vessels.

"This sale to Wilson gives SkySails the opportunity of thoroughly examining how SkySails propulsion performs during practical use in the conditions on the northern North Sea and the Norwegian Sea," added SkySails founder and managing director Stephan Wrage.

The 3700dwt *Wilson Grip*, delivered in 1996 by Slovenska Lodenice AS, of Komarno, Slovakia, offers capacity for 108TEU in hold, and 68TEU on deck. She is is 88m long, features a 12.8m moulded breadth, and produces nearly 1500kW of power. The ship will be outfitted with a SKS C 160 SkySails (160m^2). With a good wind, SkySails suggests a system of this size can generate up to 8tonnes of tractive force. *Wilson Grip* needs about 11tonnes of thrust to reach its cruising speed of 11knots.

From left to right: Ernst Susanek, president Zeppelin GmbH, Stephan Wrage, managing director SkySails.

Meanwhile, Zeppelin Power Systems GmbH & Co. KG, Hamburg, a subsidiary of the Zeppelin Group, and SkySails have announced that they are joining forces to market SkySails propulsion systems. The new partnership was initiated by the Oltmann Gruppe, which, as the financing partner of SkySails to date, arranged the bulk of the capital needed to establish SkySails. Zeppelin Power Systems will take a two thirds stake as strategic partner in a new joint venture due to be established within the next 12 months. The pair will combine their expertise and competence in Zeppelin SkySails Service- und Vertriebsges. mbH & Co. KG, which will have separate premises in Hamburg, and initially be crewed up with a staff of between 10 and 12. The new venture will market the diesel-wind hybrid power systems worldwide.

Zeppelin has been the partner of diesel engine maker Caterpillar for over 50 years and is one of its leading sales and service organisations for marine engines.

Ernst Susanek, president of Zeppelin GmbH, said: "Rising fuel costs and climate-change-related requirements and restrictions are forcing the shipping industry to change its way of thinking. The combination of cutting-edge diesel engine technologies from MaK and Caterpillar and the wind propulsion systems from SkySails will allow us to chart a new and much more promising course in our industry."

SkySails propulsion is currently in use on two cargo ships belonging to the carriers Wessels and Beluga Shipping as part of pilot testing being conducted along several different shipping routes. SkySails will begin series production in 2009 and its manufacturing capacity has already been booked for one year in advance. In general, it is claimed that the system can save an average of 10% to 35% of the fuel costs on cargo ships depending on wind conditions. According to the developer, some 60,000 of the approximately 100,000 ships worldwide are suitable for being retrofitted with this kind of towing-kite propulsion system. "A systematic global use of SkySails technology could save more than 150 million tonnes of climate-damaging CO_2 emissions every year," it said. *NA*

Rendering of *Wilson Grip* with SkySails propulsion.

How to evaluate emissions

A new software tool has been developed by Bureau Veritas subsidiary Tecnitas, which looks to provide a precise evaluation of emissions from ships.

If both governments and the shipping industry are better informed about the actual emissions from ships for any specific route and cargo, and the difference to the emission profile that any specific changes to operations will make, then better decisions about how to reduce those emissions can be made. That is the thinking which has led to the development of a new emission evaluation tool for the French government, which commissioned French shipping consultant MLTC to develop the tool. MLTC used Tecnitas, the consultancy subsidiary of Bureau Veritas, for the technical development.

The tool, a suite of software for office use, is now ready and will soon be in use by Tecnitas for benchmarking the fleet operations of major owners and charterers, and for backing up consumption checks and energy audits carried out by Tecnitas on behalf of major charterers.

"The tool is now being validated by the French National Agency for the Environment (ADEME)," said Francois Le Juste, Tecnitas manager. "Before they can develop a clear policy on how to reduce CO_2, NOx or SOx emissions from ships, they need to know what those emissions are, and what effect changes to routeing, vessel type, speed, load factor and other variables will have.

"This software will be able to tell policy makers how many tonnes of CO_2 were generated to bring any specific goods from anywhere to anywhere else, by any particular ship type."

At present, according to BV, it is not simple to estimate how much CO_2 is emitted into the atmosphere to move a pineapple from the Ivory Coast to a French port, or how much NOx to move a car from Japan to Rotterdam on its sea transport leg. It is even more difficult to get a clear fix on what changes to operations will have the most beneficial effect on the emissions profile for those particular goods.

"This evaluation tool allows the user to make changes to the inputs to the model and see how that varies the emissions per tonne attributable to delivered cargo," said Mr Le Juste. "That way they can get a real picture of the effects of cold ironing, or routeing changes, or using larger ships, for example. It will help inform policy decisions."

The software uses the energy consumption of different ship types to calculate the production of CO_2, NOx and SOx which can be allocated to any tonne of transported goods on a given route. Standard types of vessel included are bulk carriers, tankers, container carriers, liquefied natural gas carriers, liquefied petroleum gas carriers, ro-ro vessels, ro-pax ships and passenger vessels when sailing, manoeuvring or unloading at the quay. Inputs to the software are detailed ships specifications, type of engines, auxiliaries, service speed, dwt, deck outfit and air profile and the ship's operational pattern. This includes time in port, manoeuvring, time at sea at full speed or slow speed, bad weather factor and load factor on both outward and return routes. *NA*

OSG commits to lower sulphur burn

OSG America and Tesoro to commit to cleaner fuel on four newbuild vessels, which will be the first in USA to receive ABS Environmental Safety Notation Designation.

OSG America has signed an agreement with independent refiner Tesoro Maritime Company to obtain and comply with the ABS environmental safety notations on four Handysize product tankers leased to Tesoro.

These vessels, part of OSG America's series of 12 newbuild Veteran Class MT-46 product tankers, constructed by Aker Philadelphia Shipyard, are the first in the United States to receive the designation, which requires that the main engine burn fuel oil with 3% or less sulphur content, where current requirements allow for 4.5% sulphur content. This type of fuel, to be supplied by Tesoro, reduces sulphur oxides and particulate emissions.

"OSG America is committed to lessening the environmental footprint of our vessels and our impact on the land, sea and air," said Jonathan P. Whitworth, OSG America president. "We are pleased to partner with our long-time customer Tesoro to equip our newbuild product tankers to burn cleaner, more efficient fuel, ultimately reducing our air emissions."

"Across our refining system, we have made investments to produce cleaner burning fuels for our customers," added Everett Lewis, chief operating officer for Tesoro Corp.

The ABS environmental safety notation requires vessels to be compliant with all International Maritime Organization (IMO), International Convention for the Prevention of Pollution from Ships (MARPOL), and all U.S. and ABS requirements related to environmental operations, equipment and documentation.

The first newbuild tanker to be delivered under time charter to Tesoro with the environmental safety notation will be *Overseas Boston*, scheduled for delivery in the first quarter of 2009. Tesoro has time chartered three additional newbuilds from OSG America that will deliver through 2010. The vessels will trade on the West Coast of the United States. *NA*

Blocking the magic pipe

The hefty fines and whistleblower pay-outs associated with wilful or negligent oil spillage overboard mean shipowners are demanding more functionality from their bilge water alarms.

Despite the fact that International Maritime Organization Marine Environment Protection Committee resolution 107(49) dictates that alarms are tripped whenever the amount of oil in bilge water being discharged exceeds 15 parts per million, the UN Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection estimates that an avoidable 68% of pollution from ships is still attributable to deliberate oil discharge.

The Paris Memorandum of Understanding (MOU), the Tokyo MOU, and the US Coast Guard are running continuing campaigns targeting magic pipes - equipment used to by-pass ships' oily water separators, in contravention of MARPOL73/78 Annex I rules to prevent marine pollution from ships. Already, these MARPOL regulations have or are being incorporated into regional and national laws that go as far as criminalising accidental oil discharges.

Even shipowners that take pride in 'green' credentials, state of the art ships, sophisticated and expensive oily water separator technology, and well-trained crews, are vulnerable to system failures and incorrect operation, or even by-pass. As crew turnover increases, blue chip owners have been exposed to total negligence in OWS operation. In some cases, fines have run into tens of millions of dollars.

Given these facts, it is no surprise to learn that responsible owners are increasingly demanding better technology to foil the miscreants.

10 years of bilge

Swedish company Marinfloc has built up a strong presence in the bilge water separator monitoring market, reckoning to have secured 700 references for its 'White Box' system over the last decade, with clients including Carnival Corp, Royal Caribbean International, Wallenius Wilhelmsen, Odfjell and Stolt.

The SmartSafe system in operation.

A screen shot of the SmartSafe system.

The Whitebox System is enclosed in a stainless steel cage that is lockable by two padlocks. It can be installed after any bilge water separator. If it is kept locked and the key secure with the chief engineer or master, then the shipowner can rest assured that no illegal discharge is taking place, intentional or unintentional.

An oil content monitor measures the oil content in the sample and triggers alarms that divert the overboard water back to the bilge tank via the three-way valve as well as the alarm to engine control room and shutdown of the bilge water separator. Also installed as part of the White Box is an overboard flow counter, which registers the overboard flow both by old fashioned counter dials but also by electronic pulses to the recorder.

Supporting the device is a digital recorder, where data is viewable on the recorder screen but also in the accompanying software on a PC. The recorder can receive a GPS position and time/date stamp if available and can be connected over the Ethernet to automatically back up to a server onboard or ashore. It can also be remotely monitored from another computer onboard or ashore.

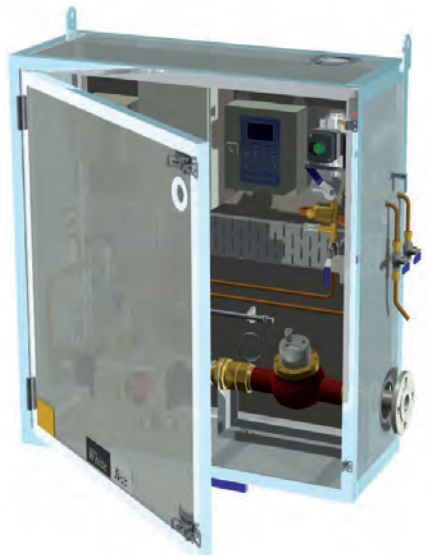
As an optional feature, Marinfloc also offers a bridge control unit. According to Daniel Olsson, Marinfloc service manager: "This is a slave monitoring system that can be mounted on the bridge for easy overview of the discharge of bilge water. It also comes with a key controlled switch that can prevent discharge overboard. Hence in an area where discharge is not allowed, the bridge officers can simply turn the key and take it out to make sure nothing can be discharged overboard. This will also produce a message on the recorder in the engine room stating 'Bridge does not approve overboard discharge'. It communicates with the recorder over the ships network and is easy to install."

Remote possibility

While characterising his company's product as "the industry standard for cruise liners", it is fair to say that shipowner demands on functionality have been changing over recent years, as the threats of prohibitive fines and whistleblower pay-outs have been growing. Accordingly, the functionality of bilge water separator monitoring systems has been expanding.

Mr Olsson said that the White Box recorder could also be monitored from another computer or ashore in real time. However, to date, this has proved "very uncommon as bandwidth is scarce onboard," he said. "A few of our installations do send running data periodically ashore for storage and monitoring. This is fully automatic and we are currently developing a tool on our website for handling reports of this data. I think periodic reports will be the likely evolution for years to come until the bandwidth improves. Then we may see more online monitoring in this application."

Jowa's Seaguard.



The White Box system from Marinfloc.

Fellow Swedish bilge water monitor supplier Jowa said that it was developing a "next generation" of its Seaguard bilge alarm system, which would be able to handle 20m^3/hr of processed bilge, and that it was also in process of developing a JCD (Jowa Communication Device). The company said that the plan was for the latter interface module to be adapted to any Jowa product for connection to a vessel's Ethernet, and via the Internet "to a database where the owner has access to monitor the location of discharge, the amount, ppm levels and the status of the units."

Plug and play

Already up and running is the SmartSafe system from Rivertrace - a completely new Bilge Overboard Security System that the company describes as "the shipping industry's first working automatic 'plug and play'" technology. Rivertrace has no qualms about bandwidth, because it has reached an agreement for its electronic system to be tracked via Purplefinder, allowing shipowners constant remote access to bilge water monitoring.

A liquefied natural gas carrier and a car carrier, under completion at leading South Korean yards, are the first ships at sea to feature SmartSafe.

SmartSafe records and prevents illegal overboard discharges, because it is specifically designed to ensure that the bilge oily water separator cannot be by-passed. The PLC-based system uses Rivertrace in-house written software to monitor the separator system's diverter valve and flow rate and cumulative flow through the discharge pipe, detecting any attempt to tamper. Available for newbuildings and for retrofit, SmartSafe is compatible with any type of separator and separately controls its own overboard diverter valve.

The system can be connected to a ship's local area network for monitoring on the bridge, so that the navigation officer can intervene in controlling or stopping discharges. Via Purplefinder, shipowners can track the GPS position of their vessels at any time and ascertain whether a discharge is taking place. They can even stipulate that valves remain closed when a ship passes through a Particularly Sensitive Sea Area.

The system anticipates illegal discharge and shuts off the overboard discharge valve if necessary. Should anyone try to tamper with SmartSafe, or shut it down, a spring loaded valve is tripped, forcing the diverter to close. Tamper attempts can also result in an alarm being tripped in the owner's office, or a warning being sent to the mobile telephone of the duty manager.

At the end of the discharge process, a batch record is printed containing all aspects of the discharge and any errors or inconsistencies that occurred during the process. A printout stretching back across two years of data can be attached to the manual oil record book for presentation to Port State Control inspectors.

Setting SmartSafe apart from its rivals, according to Rivertrace, is its graphic 'replay' capability, where each start and stop of the oil discharge process creates a secure and unique file. The supplier said that shipowners using SmartSafe could thus be assured of PSC compliance - avoiding exposure to time delays in port at the hands of PSC. Managing director of Rivertrace, Mike Coomber, said that the cost of the system could be recouped in the time saved during Port State inspections. *NA*

GREEN PLUS adds value

Genoa-based class body RINa says it has developed a system which can produce a simple numerical index to compare all types of equipment and practices aimed at reducing the environmental impact of shipping.

How can you measure the relative and cumulative value of different environmental improvement measures? How does a reduction in air resistance equate to a better water treatment plant? Does a high efficiency propeller do more for the environment than a crew training programme and system to keep energy use down?

Shipowners have considered, and even implemented, all these means to reduce their environmental impact, and there are a wide range of systems and procedures to choose from. Not all work for all ships, and not all work in harmony. Therefore, how can owners decide on the mix of equipment and procedures that will be most cost-effective and produce the best environmental benefit for their particular case? And is there a simple way to show the world what has been done?

Genoa-based RINa is aiming to answer these complex questions with a system it says can produce a simple numerical index that compares all types of equipment and practices aimed at reducing environmental impact on the same scale, and which gives owners, designers and users of the ship a clear measurement in one number of the ship's overall environmental impact. The class body is calling the solution GREEN PLUS.

Paolo Salza, RINa technical manager, says: "We want to help owners who want to be ahead. Fixed regulations cannot always keep up with technological developments and public expectations. The industry needs a notation which demonstrates that the ship meets public aspirations for a lower overall environmental impact. The large number of design solutions, onboard equipment, and operational procedures available in today's industry, together with technological development, dictate a goal-based, rather than a prescriptive, approach. That is why GREEN PLUS has been designed with sufficient in-built flexibility to allow owners the latitude to choose those tools which they deem to be most appropriate, subject to achieving an assigned value in an environmental index."

Paolo Salza, RINa technical manager: "We want to help owners who want to be ahead."

> "GREEN PLUS gives yards and owners a new way of looking at environmental performance, over and above compliance with set standards."

Mr Salza adds: "GREEN PLUS gives yards and owners a new way of looking at environmental performance, over and above compliance with set standards. The system measures all the means employed to reduce all of the environmental impacts of the vessel, including CO_2 emissions and comes up with an index. Everyone can see clearly what each ship is doing, which is currently impossible given the sheer number of different environmental impacts and solutions to them. We have discussed this with a number of owners and are now analysing the contractual specifications of some newbuildings to check the possible GREEN PLUS score for them. We hope to be able to announce the first ship with GREEN PLUS very soon. It will give the whole shipping world an example to live up to."

GREEN PLUS is aimed at new vessels which make a significant investment in design solutions, onboard equipment, and operational procedures which contribute to an improvement in environmental performance beyond the minimum levels required by regulation.

Design solutions and onboard equipment include anything which reduces the risk of pollution, or which lowers fuel consumption and air emissions. Innovative engine design, alternative fuels, high-efficiency propellers, optimal hull design and bio-degradable oils all fall into these categories.

Operational procedures covered by a GREEN PLUS notation include those which ensure that design solutions and onboard equipment are correctly used, voyage planning programmes resulting in reduced fuel consumption and emissions, or training courses designed to increase the environmental awareness of officers and crews. *NA*

Enterprise boldly goes green

Mitsui O.S.K. Lines, Ltd. and California-based CleanAir Logix, Inc. have completed tests on a liquefied natural gas-fuelled shore power supply system for the 4500TEU capacity containership *MOL Enterprise*.

MOL said that its latest tests of 'cold ironing' technology, supplied to the containership *MOL Enterprise* in the presence of officials from Port of Los Angeles, would see the shipowner develop and provide shore power supply sources, "which MOL hopes will lead to better environmental practices".

CAL used a system that was connected to the power cable for the bow thruster motor from an onshore generator running on LNG, substantially reducing emissions of pollutants such as NOx and SOx compared to running the vessel's generators, which operate on heavy fuel oil. During the test, only two of the ship's four onboard generators were in use.

CAL said its dual frequency, multi voltage (DFMV) mobile shore-side power system resulted in the elimination/reduction of NOx, SOx, CO, and DPM10 emissions, equivalent of taking 1 million cars off the road. The CAL Cold Ironing system is designed to connect to virtually any ocean-going vessel, regardless of its country of manufacture.

The CAL DFMV LNG-powered generators synchronise with the multiple voltage and frequency requirements of the wide variety of ships in service today. Once connected, the DFMV generator is designed to operate in parallel with the vessel's electrical system without any disruption to normal operations.

The CAL DFMV Cold Ironing system is certified under the California Air Resources Board (CARB), meeting all criteria of the Equivalent Emissions Reduction option for compliance with the recently released '*Regulation To Reduce Emissions From Diesel Auxiliary Engines On Ocean-Going Vessels While At-Berth At A California Port*'. This regulation requires oceangoing container, reefer, and passenger ships to connect to clean shore-side electrical power while tied up at-berth in a California port.

MOL will use the results of this test to develop and provide shore power supply sources at its TraPac Terminal. ***NA***

Partnership for peak performance

Deltamarin Ltd and Fairgreen Consulting Ltd have formed a new alliance intent on delivering practical energy saving and environmental benefits.

Aiming to combine the shipboard engineering and master mariner experience vested in Fairgreen Consulting with the naval architecture and design engineering expertise of Deltamarin, two Finnish companies have formed a new joint venture whose remit is to save energy onboard ship, by casting an eye over matters ranging from operations and training to more fundamental structural refinements.

Mikko Eskola, managing director of Fairgreen, said that no detail was too small for consideration. "Small adjustments can add up to huge percentage differences in energy consumption for shipowners. In the cruiseship sector, for example, the simple fact that a group of tour busses might be late could mean the ship having to catch up on schedule, thus burning more fuel than might otherwise be the case." At the other end of the spectrum, the conversion of an older ship's aft section to include a duck tail promised greater operational efficiency.

A first phase project for the partnership is understood to involve V.Delta, itself a joint venture between Deltamarin and V.Ships Leisure established at the beginning of 2007 to provide cost and time effective conversion solutions to cruiseships, ferries and mega-yachts.

Mika Laurilehto, Deltamarin managing director, said that the partnership would "evaluate fuel saving and environmental concerns on newbuildings and conversions. We will evaluate existing vessels and how energy is consumed. We can do projects to convert or retrofit, evaluating new technologies and aspects of training the crew to conserve energy. For example, enhancing the trim of the ship can save fuel. Where newbuildings are concerned, we want to start 3D modelling at the earliest possible stage, using CFD to do pre-predictions before we go to tests."

Among a long list of areas for consideration, the partners are assessing the relationship between upfront costs and annual operational savings of installing fin stabilisers, new propeller blades, propeller polishing, improving the shaft line arrangement, new hull coatings, and the installation of energy saving lighting.

Mr Eskola said that, as well as cruiseships, current projects included tanker designs. Mr Laurilehto added that interests also took in bulk carriers "which have in the past been optimised for construction, rather than operations. We estimate that by optimising the hull, looking at the propulsion equipment and analysing the bow and aft sections, we could achieve a 20%-25% reduction in power on a bulk carrier. We have learned a lot of lessons from the aft sections of fast passenger vessels, for example, and these could be applied to enhance the way water flows through a bulk carrier's propeller." ***NA***

Saving waste energy

Marine waste systems specialist Evac reports strong uptake among energy conscious cruiseship owners for its latest Onlinemax unit, a new product for vacuum generation used in waste disposal onboard vessels.

As of the start of October 2008, Finnish company Evac was able to claim 31 references for its new Onlinemax vacuum generation backplate system, either as test installations, as retrofits or on newbuilds, aboard 20 different ships.

The OnlineMAX concept has been designed to meet the growing need for larger and more energy-efficient vacuum capacity on large passenger vessels. With a payback claimed at between two and three years, installation of the new system can be executed by ship crews during the cruising time, with no yard necessarily involved. In the case of a retrofit, only three connection points are required from Onlinemax to the existing tank and manifold. Onlinemax is installed close to the existing waste collecting unit alongside the ejectors (normally four) and it takes up about 1m^2 of space. The existing units are still there, as are the tanks, while the existing ejector pumps are still used for discharge purposes.

In a newbuild situation, the complete unit is based on the Onlinemax configuration.

The supplier quoted Carnival Freedom chief engineer Gastone Lazzari as saying that the Onlinemax system, under its initial guise as the MaxVac Unit had replaced a traditional pump and injector system and had worked successfully through a five month test period. "I am satisfied of the overall performance of the MaxVac Unit and I believe that this technology represents a great potential for future installations," he said.

Evac's Onlinemax, as installed on a cruiseship.

According to Evac, the main benefits of the system are its energy saving attributes the elimination of foaming, and levels of efficiency in vacuum creation, which in turn brings many benefits like elimination of blockages in piping etc. It is understood that, in some cases, energy savings approaching 80% have been achieved when comparing the Onlinemax to traditional pump and injector systems.

As well as cruiseships, Evac says that the Onlinemax system is appropriate for other types of ships. The company has just developed the new 'Onlinemax 100', termed a smaller brother of the existing unit, which is applicable to smaller vessels, such as river cruisers, oil rigs and vessels with capacity for up to around 100 passengers. *NA*

Hatteland displays energy management

Hatteland Display has been selected by Icelandic energy management specialist Marorka to provide the marine displays and computers for its onboard fuel efficiency and emission reduction solutions.

It is possible to save a significant amount of fuel on any given trip if main marine engines are used correctly, and a whole fledgling industry is emerging dedicated to providing systems for engine performance monitoring.

The Marorka Maren Marine Energy Management System is equipped with simulation-based decision support, energy analysis tools and energy controlling features, where the Marorka Fuel Manager keeps track of fuel consumption, giving the crew a snapshot overview.

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EMSA puts SOLAS to the test

HSVA has secured a contract with the European Maritime Safety Agency (EMSA) to research the damage stability of ro-pax vessels designed according to the new SOLAS 2009 stability rules.

Hamburg-based test facility HSVA has been tasked by EMSA with calculating water on deck in the case of ro-ro passenger vessels, with a view to amending Directives 2003/25/EC and 98/18/EC.

The purpose of the six month project is to investigate whether the safety level of ro-pax ships designed according to SOLAS 2009 is adequate. For this research a consortium was created under the leadership of the HSVA consisting of the FSG-Shipyard, the design office SDC in Hamburg, the Hamburg University of Technology TUHH and the HSVA. Damage stability of two ro-pax ships designed by the FSG-Shipyard will be investigated according to different stability rules, using numerical simulation and with model tests of the damaged vessels in irregular seas.

The final report, due in late April 2009 is expected to throw light on the sufficient values of the damage stability parameters in the SOLAS 2009 rules.

Directive 98/18/EC, on the safety rules and standards seeks to introduce a uniform level of safety of life and property on new and existing passengerships when engaged on domestic voyages inside EU waters, and to enable the harmonisation of the rules for their international voyages outside EU waters. Following the current SOLAS 74, it is in a phase of revision which, among other things, takes into account the new stability calculation regulation for passenger vessels that are built after the entry into force of SOLAS 2009.

Directive 2003/25/EC concerns the regional IMO requirement for the calculation of water on deck relating to damage stability of ro-ro passenger vessels. The Directive makes reference to Directive 98/18/EC and applies not only to new ships, but also to existing ships in EU waters.

According to EMSA, bearing in mind that there have been several major disasters involving this type of ship in recent decades, "this matter is considered to be of fundamental importance and worthy of significant further research".

Estonia sank in 1994.

EMSA said that the expected outcome would be a study containing suggestions for appendices to IMO SOLAS 2009,Ch. II-1,Reg.7-2 Damage Stability Rules, "to address the issue of accumulated water on deck for ro-ro passenger ships in hull damage and range of natural conditions corresponding to Stockhom Agreement rules, as minimum".

The main aim of Directive 2003/25/EC is to ensure, as far as possible, that there will be enough residual stability retained by a ro-pax vessel engaged on international voyages, when a column of water has accumulated on the car deck.

The test includes:

1) Designing of the hull and subdivision of large (L=180-200m,B=28-31m) and small (L=70-80m,B=16-19m) ro-ro passenger vessels according to SOLAS 2009 standard for the computer simulation and for tank testing models. This must include, in addition to the bulkheads and deck, the effects of the tanks, escape ways, piping, machinery room, trunks, air conditioning ducts, etc.

2) Developing the computer program for both hull models and simulation of the damage stability in different flooding conditions, residual freeboards and sea states, involving water on deck. The results should include the effect of water on deck on the stability curve KG (or GM) by function of moulded draught.

To meet these objectives, it will be necessary to build up a computational, 3D digital model of a ro-pax in order to study her survivability, and it is required to have a software for static stability (e.g. NAPA, FORAN, etc.), and for dynamic stability (e.g. PROTEUS3, SIMCAP, FREDYN, etc).

The complexity will determine the hardware requirements, typically a 4-processor PC, 3GHz, 2GB RAM, 200GB HDD, or equivalent Apple Mac, Sun or other. (the bigger the better).

The specification of the numeric calculation capacity will include a minimum of 100 million cells. *NA*

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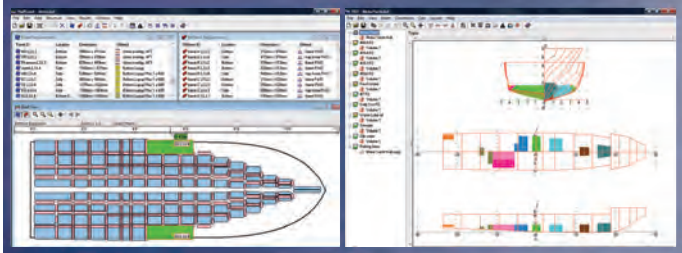

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A new STAR arises

CD-adapco has released STAR-CCM+ V3.06, the latest version of its engineering simulation software.

CD-adapco has added a solid stress function to its STAR-CCM+ integrated platform. Jean-Claude Ercolanelli, CD-adapco vice president, product management, suggested that the new release represented a paradigm shift in the simulation of multi-field and multi-domain problems: "Everyone appreciates that most practical problems involving fluid dynamics are in some way also related to the interaction between fluids and one or more solid bodies," he said. "In the past, Fluid Structure Interaction (FSI) normally required manual sequential coupling between CFD and structural analysis software. The implementation of finite volume solid stress modelling within STAR-CCM+ has changed this situation, providing users with the ability to automatically solve the physics of both fluid and solid domains simultaneously, resulting in a complete simulation of Fluid Structure Interaction (FSI) using a single computational model".

The latest version of STAR-CCM+ extends modelling capabilities by introducing the ability to simulate the movement of solid bodies using either embedded motion or mesh morphing; by enclosing the body to be studied in a spherical or cylindrical sub-domain. The embedded motion technique allows the simulation of extreme levels of rotation, such as lifeboats falling into water or shipping containers slamming into the ocean. According to CD-adapco, while the sub-domain is free to rotate without limitation, the rotation and translation of the outer fluid domain may be limited; ensuring the robustness of the solution without having to resort to time and resource consuming re-meshing techniques.

For more complex movements and situations involving multiple bodies, STAR-CCM+ has the ability to "morph" the volume mesh either prescribed by the user or automatically. By deforming the mesh around an object, without the need for remeshing, the morphing model can be used to simplify many moving mesh simulations including fluid and rigid body-interaction, as well as design optimisation studies.

The enhancements included in the update are aimed at improving the quality of simulation results, whilst increasing productivity that can now get the Native CAD readers with the latest geometry configurations from designers without translation or file duplication, projection back to CAD after remeshing or wrapping, which means that high quality meshes can be created on curved surfaces, such as those at the leading edge of an aerofoil. *NA*

NavCad's Extras

New features have been added to Hydrocomp's NavCad software tool for prediction and analysis of vessel speed and power performance.

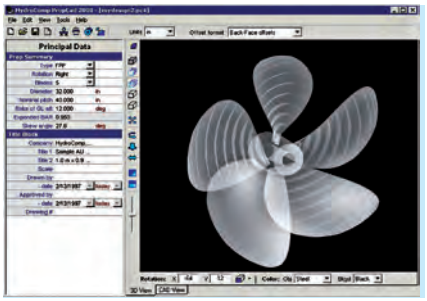
Extra features have been added to the NavCad main resistance and propulsion software packages, which include analysis parameter entry tables, an analysis option for user selection of standard techniques, a user task list to create and track projects and supplemental hydro-acoustic analysis to estimate blade impulse and tip vortex pressures.

Hydrocomp says future updates will include a job tracker project management facility, enhanced definition of hull geometry via longitudinal distributions of sectional area, plus new measures to determine propulsion merit, such as transport effectiveness to allow qualitative comparison to industry-standard measures.

In November, Hydrocomp announced new features for its PropCad software, which now offers an integrated report viewer, with reports exportable to PDF and CSV formats, as well as improved design control for certain shapes and the ability to "lock" geometry, updates to classification society thickness calculations. PropCad also exhibits new section geometries. Further developments of the software in the future will see enhanced data management and user features supporting both traditional and advanced propeller design strategies, additional data and calculation support for wake adapted propeller design and more data exchange with propeller hydrodynamic codes.

Along with PropCad, Hydrocomp's PropExpert package has also benefited from additional features over recent months, including evaluation of the effect of shaft angles using a new "inclined flow" algorithm, a blade scan utility that helps identify a propeller's blade area ratio and hydrodynamic mean pitch, and a new pitching algorithm that has been developed based on a re-analysis of cupped propeller data. Future development of PropExpert will concentrate on performance correction for the effect of camber (progressive pitch), along with new speed prediction options being developed for new vessel types and supplemental vessel types. *NA*

Hydrocomp's PropCad package.



ShipConstructor builds on 2008

The release of ShipConstructor 2008 R3 is claimed to include significant software advances for the world of shipbuilding.

The latest version of ShipConstructor includes a list of enhancements when compared to its predecessors, including new pipe routeing and modelling tools in its Pipe Module, which is a complete 3D production modelling package based on a parametric catalogue of stocks and standards. These tools allow for changes to the piping system by intelligently modifying connected parts. This 'One Touch-Multiple Change' automation function is said to reduce human error while increasing accuracy.

ShipConstructor says that the user can roughly lay out a system using only straight and elbow components, then insert valves, tees, flange sets etc. at a later stage. Flanges and other connector components, as well as end treatments on straights, are adjusted automatically and reducers are inserted as required to accommodate changes in line size. All of these tools are fully integrated with the existing ShipConstructor Pipe routeing environment and any operation that results in two parts connecting will automatically insert the required components.

A new 'Find & Replace' feature for the Pipe Module allows the user to quickly change components used for an entire run and simplifies line-size change operations. The tools are designed to ensure that fitting components stay in the same location as was the case before the find and replace operation, and adjusts any necessary straight components to ensure that the replaced system is still fully connected.

Also featured in 2008 R3 is the Universal Seat License Model, which is said to be a flexible, cost reducing alternative for assessing resource allocation. As design projects progress through hull, structure, piping and on to production, universal licenses will provide the flexibility to apply resources where required.

The first stage of the Electrical Module is being introduced in R3. It will allow users to define electrical cable and cable support libraries in preparation for use with the modelling and production output tools scheduled for release in 2009. *NA*

The hype about CAD

Open Mind Technologies has launched a new version of its hyperCAD software, adding numerous updates to the software.

Open Mind reckons to have revised its CAD offering to increase the clarity of the software, increase productivity, and to better support users in their day-to-day work.

The developer says that it has enhanced the package's properties in the area of work planes and references systems, which can now be configured using a shortcut menu. Users will also benefit from new degrees of freedom in the configuration and appearance of the work planes, allowing them to adapt these according to their individual needs. A completely revised layer management also provides more clarity, says Open Mind. It can be activated in the browser's taskbar and is always available. The status of each layer can be discerned at a glance: name, colours, line type and thickness, number of elements or the status, i.e. whether the layer is locked or unlocked. Additional password protection prevents unauthorised access to critical data. If the layer is password protected, then the data can neither be graphically edited or manipulated nor deleted. The lock with snap serves to make locked elements available for selection for snap functions. Thanks to the layer filters, it is now possible to make selections according to specific criteria for a reduced view.

Improvements have also been made in aspects of simple 3D surfaces and solid functions, the developer says. New functions, such as 'rotational extrusion' or 'triple tangential rounding' have been implemented in hyperCAD 2008.1, which makes modelling easier for the user.

A completely revised graphic interface has also been devised, to improve element representation. Open Mind says that, compared to the previous version, the performance increases in the case of larger networks by a factor of 4 to 5. The stock representation in Hypermill also benefits from this improvement.

Meanwhile, all 2D drawing functions have been transferred to the proven 3D user interface. These powerful functions make 2D drafting more effective.

With the optimised section view the section can be optimally defined and the section area can be assigned its own colour. Additional functionality include new selection options for contours or model quality control. The model comparison now offers the user the possibility of recognising the remaining material or analysing statuses and thus adapting the machining strategy accordingly.

Open Mind Technologies has also announced that Autodesk has certified the compatibility of Hypermill with Autodesk Inventor 2009, providing full integration with the newest version of its CAD suite.

The integration process included adapting the user interface of the Hypermill CAM application to match the CAD interface of Autodesk. Autodesk 2009 users, as well as users of the 2008, 11 and 10 versions of Autodesk, can therefore continue to operate in the working environment they are familiar with. The certification process of Autodesk also ensures the seamless integration of Hypermill with Inventor 2009. *NA*

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Complete process through Cenit

Dassault Systèmes and CENIT AG have launched the 'Cenit Naval Architect' package as an add-on to the Cenit Marine product family, which integrates weight evolution management, hydrostatic and stability analysis in CATIA solutions for yachts and ships.

Partners Dassault Systèmes and CENIT AG are now marketing what they say is "a breakthrough end-to-end solution that streamlines the boat design and engineering process to fully enable the naval architecture design spiral".

According to François Mathieu, Dassault Systems yacht market development leader: "Cenit Naval Architect enables integrated boat design in CATIA, allowing shipyards, marine engineering companies and naval architects to cut down development times dramatically, reduce costs and efficiently optimise areas of ship development like weight management, hydrostatics and stability."

Naval architects traditionally use disconnected solutions for weight definition, shape modelling, structure and layout drawings, and hydrostatic and stability calculations based on 2D offsets methodology. Combined with CATIA, Cenit Naval Architect is said to offer an innovative platform that integrates the complete process from shapes design to stability and structure calculations. Using MAAT Hydro+ volume-based computation engine, it will facilitate advanced hydrostatic and stability calculations with real-time simulations as well as automatic report generation in compliance with classification societies' requirements, according to its developers.

Mr Mathieu added: "Our solution makes it possible to work in the same environment all along the main phases of naval architecture and ships design. This design process integration means that [there is] no need for data transfer, re-capture and re-creation of lost surfaces during transfer: with our solution, one uses the same repository all along the design spiral, saving a lot of time.

"The CATIA design method for ships allows [us] to keep the link between the main geometrical references (hull, deck, superstructures, frames, casing, compartments) and the objects of the design (metallic structure, tanks, GA drawing, loading conditions for stability calculation) so that if when the hull shape is changed at any time during the design process, all the data connected to the hull will update automatically making huge time savings."

He said that 'Cenit Naval Architect' had three major capabilities:

1- ship weight management (from estimated to computed when the design is progressing).

2- ship hull form modelling under permanent control of preliminary hydrostatic information that are dynamically updated when modifying the Hull Form.

3- advanced Hydrostatics and advanced stability calculations.

"For this third capability we have integrated in CATIA the MAAT Hydro+ (MH+) software developed by Sistre International and formerly known under the name of Circe (almost 30 years ago). The MH+ hydrostatic solver is a new technology based on solids that allows much better precision especially on complex shapes with singularities. It's also providing real time hydrostatic results when testing various situations of floating positions, making the hydro validations faster.

"Last but not least, the MH+ solver is managing the stability calculation for intact and damaged cases and one can select any of the stability criteria according to the current regulations. In the new version a stability criteria editor is provided, making it easy to customise the criteria. At last, all the data (tables of values, curves) coefficients and values necessary in the reports for classification societies are automatically generated." *NA*

Wolfson Unit advises on Spanish facilities

The government of Galicia and the University of La Coruña are working together to set up a Marine Technology Centre in Galicia, North West Spain. Their proposal is to build a towing tank and wind tunnel to provide a local service tailored to the needs of their buoyant marine design and shipbuilding industries.

Having reviewed the various experimental establishments around Europe, the technical leaders of the organisation recommended that the new Technology Centre should be modelled on the Wolfson Unit. Wolfson Unit said: "Our flexible and innovative approach to model testing, and our experience of working in a large number of test facilities, will enable us to provide valuable guidance in designing, equipping and operating their facilities."

Wolfson Unit's Barry Deakin was invited by the government of Galicia to make a presentation at the Navalia Fair in Vigo in May, to illustrate to industry representatives the wide range of issues that can be addressed with a towing tank and a wind tunnel. The presentation was followed by others from an existing Spanish Technology Centre (Centro Tecnológico Naval y del Mar), and from the general director for research and development - the government representative responsible for the new Centre.

Vietnam faces up to the challenge

The financial crisis has put the brakes on Vietnamese plans for shipbuilding, but the determination to rise to number 4 building nation in the world remains in place.

Shipbuilders the world over have faced challenging times in 2008, but the brunt has been felt by those yards developing completely new facilities.

The Government of Vietnam has prioritised shipbuilding as an integral part of its industrialisation strategy. Some US$750m raised in the nation's first sovereign bond for the international market, in 2005, was given to state-owned shipbuilder Vinashin (Vietnam Shipbuilding Industry Group) for development purposes. By 2015, Vietnam's shipbuilding industry set its sights on the number four slot in world rankings.

This time last year, some US$3billion was envisaged as being invested in new facilities over the next decade..

However, as Vinashin readily acknowledges, the intervening months have seen the group having to adapt to global financial turbulence and, in building new yards at the same time as it is building new ships, subject to inevitable 'teething troubles'.

Vinashin chief business officer, Nguyen Quoc Anh, said: "Due to both subjective and objective reasons, there have been some delays in deliveries this year. However, Vinashin has made some improvements and innovations to increase productivity to shorten the delivery schedule.

Inevitably, the financial uncertainty has thrown a portion of the 141 ship orders booked in Vietnam into doubt. Mr Anh confirmed: "Faced with financial difficulties, some shipowners have been discussing with Vinashin about turning some firm vessel orders to options. For example, a signed-five-firm-vessel newbuilding contract may be changed to a three-firm plus two options."

This being said, those deeply involved in Vietnam's shipbuilding project remain convinced that prevailing conditions are entirely temporary. According to one leading European equipment supplier with deep roots in Vietnam: "The investment in new yards and expansion during the past five years is of a magnitude that will enforce continuation, however at a slower pace. We fully expect that the Vietnamese shipbuilding industry will regain its strength and position when the financial turmoil is over and market conditions are back to normal."

Vinashin chief business officer, Nguyen Quoc Anh.

In March-April, the Vietnamese government's efforts to fight inflation resulted in it ordering major infrastructure projects to be delayed, or even suspended. The mid-year oil price spike had a further negative impact on prospects and was followed by the global financial crisis.

According to another leading marine equipment supplier: "Given the situation, we expect the local shipbuilding industry to reshape, with less efficient facilities to be restructured. Also Vinashin's huge organisation may get less centralised and become more dynamic and, more importantly, more efficient."

Mr Anh commented: "We met some financial difficulties in 2008, due to the effect of the international financial crisis. At the beginning of the year, the Government applied a money tightening policy. Therefore, we should recalculate our investment plan and focus on projects that can receive back money in the shortest time. We give our priority to contracts of building ships for export."

There remains little doubt that government continues to see shipbuilding as central to its industrial stratregy. "With the weakness of the international financial market, in the fourth quarter of 2008, we received support from the Government to request four Vietnamese state-owned banks to give loans for our implementing projects [in the current] market condition," said Mr Anh. "We also got the approval from MOF [Vietnam's Ministry of Finance] allowing us to issue a domestic bond. The total amount of supporting package is around US$1 billion."

However, Vinashin is readily aware that its future sustainability will also rely on a root and branch reassessment of its business model.

Vinashin has once more turned to KPMG for advice on how it might be reorganised to enhance efficiency. According to Mr Anh: "Vinashin desires to set up a management model as a holding company appropriate to Vietnam's social economy. Besides, we are implementing plans to enhance cash flow management efficiency, organisational structure in finance and accounting following international standards."

Facility build up

If 2008 has been challenging, it should not be overlooked that Vinashin's ambitions remain extensive. Around 24 vessels are understood to have been delivered last year, while the expectation is that Vinashin, will deliver 79 vessels in 2009.

At the same time, the build up of new facilities has been rapid. In 2008, the Ha Long yard completed work on its new 70,000dwt capacity slipway and associated workshops, while the Nam Trieu and Pha

2008 deliveries from Vinashin

- Three 'Diamond 53', 53,000dwt double hull Handymax bulk carriers Hull No. HR53-NT02/HR53-HL02/HR53-HL04, built at Nam Trieu and Ha Long shipyards for Graig Shipping.
- Two 8700dwt general cargo vessels Hull No. HLK-102 and HLK-104 built at Ha Long shipyard for Japanese owner.
- Two 6500dwt tankers built at Pha Rung shipyard for Korean owner.
- Six 5000 HP tugboats, one crew workboat, and four small workboats built at Song Cam shipyard delivered to Dutch owner.
- One 22,500dwt bulk carrier built at Bach Dang shipyard for Vinalines.
- Three 12,500dwt bulk carriers built at Ha Long shipyard for Vinalines.
- One 2900dwt bulk carrier at Sai Gon shipyard for Danish owner.
- One Lash 10,900dwt built at Nam Trieu for Vinashinlines.
- Other vessels from 1000dwt - 5300dwt bulk cariers built at Nam Ha, Thanh Long, Song Dao, Truong Xuan, Hoang Anh, Da Nang, etc.

(source Vinashin)

Rung yards, also clustered around Hai Phong, continued to build one 70,000dwt capacity slipway apiece. Meanwhile, the Ben Kien yard added crane capacity, the Bach Dang yard continued construction of a 6500dwt capacity slipway, the Cam Ranh yard continued to build a 50,000dwt slipway, while the central Dung Quat yard continued work on a larger 100,000dwt capacity slipway.

Work at Nam Trieu, Pha Rung, Bach Dang, Dung Quat: and Cam Ranh is due completion during 2009, a year that will also see the start up a construction project to build a new 30,000dwt capacity slipway at Nhon Trach, 60km from Ho Chi Min City.

Supporting class

Leading the way among the class societies in laying the foundation for Vinashin to become one of the world's leading shipbuilders has been Det Norske Veritas. The class body reckons to have an orderbook market share in vessel numbers of almost 65%, while in gross tonnage terms, its share is close to 80%. Among the 91 ships on order to DNV class, 60 are bulk carriers.

The class body has embedded expatriates with extensive shipbuilding experience at Vinashin's main yards. As well as offering targeted workshops aimed at foremen and welders, DNV is two years into a three year continuous training programme bringing new levels of competence to 1000-1200 shipyard workers per year, and is also offering courses in the certification of materials. .

John Marshall, DNV country manager, Vietnam, said: "DNV is doing something different in Vietnam when compared to the other class societies. As well as putting experience in place, we are focusing on developing the industry and competence in a systematic way. We went into this with our eyes open with a long term strategy in mind."

Also making its mark among the class bodies supporting Vietnamese ambitions has been Class NK, which had classed 40 ships built in the country to 31 October, 2008, and operates three surveyor offices in Vietnam. In 2006, the society classed nine ships built in Vietnam (49,742gt), rising to 13 ships in 2007 (114,405gt), with five 2008-built ships classed in the year to October (42,649gt). A further 17 ships (225,000gt) are under construction in Vietnam to NK class.

ClassNK said that, in 2008, it had also begun offering certification services for various materials, equipment, machinery, and fire protection to a number of leading companies and plants in Vietnam.

ABS, meanwhile, said it had "constantly been assisting the Vietnamese shipyards in their endeavours to provide shipbuilding capabilities commensurate with the demands of the international market".

The Pha Rung yard, one of Vinashin's key building facilities.

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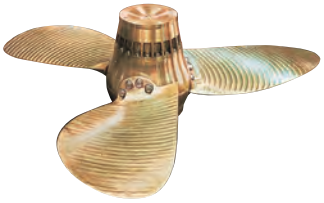

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Aalborg Industries' boiler factory in Hai Phong, Vietnam.

The class body is working through a series of projects at various Vinashin shipyards, ranging from a floating storage and offloading vessel, two Aframax tankers (for Vinashin Lines), and is also classing a series of offshore supply vessels being built at the Strategic Marine Shipyard.

ABS has four expatriate surveyors in Vietnam and said it was "working with our Vietnamese surveyors to increase their skill through rotational assignments in other major shipbuilding countires. This will provide the foundation for delivery of ABS services in Vietnam. Additionally, ABS engineering offices have been working on providing assistance with designs being developed by the Vietnamese yards to ensure compliance with International Standards."

Equipment matters

The sustainability of Vietnam's shipbuilding ambitions will also depend on the development of marine equipment supply.

Aalborg Industries took a lead in this regard, establishing a joint venture with Vinashin and inaugurating a factory in Hai Phong in May 2005. From the outset, the basis for production was to be a mix of boilers for local yards and for export. The facility now turns out around 100 boilers per year.

The supplier gave some insight into the sheer speed of Vietnam's shipbuilding development. "The entire Vietnamese marine industry has undergone the colossal change from a small local industry building smaller and far less complicated ship types into a major international shipbuilding nation," said Ole Lund, Aalborg senior general manager, front end South East Asia. "It is a huge challenge to go from almost nothing to a position as the 4th or 5th biggest shipbuilding nation in a short span of years. One of the main reasons for the success is a young labour force that is very interested in learning and working hard to pick up new skills."

Engine makers, too, are investing for the long haul. Wärtsilä built up an extensive orderbook through 2007, covering engines, propellers and generators for a series of tankers, bulk carriers and ro-ro ships, among others. After signing a licensing agreement with Vinashin in May 2007, both Wärtsilä's organisation and activities have grown quickly. In fact, the supplier could claim to have stolen a march on its rivals, with its business including the 53,000dwt and 34,000dwt bulk carriers for Graig, the order for 4900 unit capacity PCTCs from Ray Shipping, and the FSO for Petrovietnam subsidiary Petroleum Technical Services Corp.

Meanwhile, a MAN Diesel/Vinashin joint venture plant is due completion in the Hai Phong region in 2009.

Also fully supporting the build up of expertise among Vietnamese shipbuilders have been leading cargo access suppliers TTS and MacGregor.

TTS has two hatch cover projects in Vietnam, one at NASICO (Vinashin's shipyard in Nam Trieu) where it has delivered one full set of hatch covers for the first ship in an anticipated series of 700TEU capacity ice class containerships intended for MPC in Hamburg. However, due to financing, some doubt now exists over this contract.

In a second project, TTS is working with Pha Rung shipyard, 20km from Hai Phong, in supplying hatch covers and cargo cranes to the Diamond 34 bulkers built for Graig.

TTS will also supply car decks for the car carriers due to start construction for Ray Shipping and Hoegh at the Ha Long and Nam Trieu yards.

MacGregor said that one of its latest moves to expand its production capacities worldwide had seen the formation of a new partnership with Lisemco, a company based in northern Vietnam. Lisemco compliments a portfolio of two other partnerships that MacGregor holds in the country: one with Lilama 3 and the other with Vastalux-Alpha. The start of hatch cover production in all factories is planned for 2009.

MacGregor also has a joint venture with Vinashin for production of hatch covers and has an orderbook for key equipment contracts onboard 31 vessels being built at numerous Vietnamese shipyards for various shipowners. MacGregor equipment, comprising hatch covers and cranes, is destined for bulk carriers and multi-purpose vessels.

Other voices

Alongside Vinashin's high profile development, the progress of smaller yards in Vietnam should not be overlooked. Bureau Veritas, for example, said that it was now involved in 70 separate shipbuilding projects in the country, and that only one of these (a 33,500dwt bulk carrier project for Vinaship, under construction in Ha Long) was connected to Vinashin.

According to Patrick Le Dily, until recently BV's head of marine in China and Vietnam, but now back at BV headquarters, while the timing and extent of Vietnam's shipbuilding expansion is now uncertain, the nation still holds strong cards in the shape of its heavy industry, cheap labour, shipbuilding

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experience to date and its "hard working people". "We are reasonably confident and satisfied with the quality of production, subject to class society approval," he added.

BV has been working on a series of 10 x 26m crew boats for Bourbon. It is also working through a series of platform supply vessels under construction at the Damen/ Vinashin joint venture yard in Hai Phong.

BV said it was also classing a series of 10 cargo ships for Vietnamese owners and 14 x 2600dwt multi-purpose ships for Dutch owners at various smaller yards.

Also on the BV books has been a project to deliver a floating dock to the Australian Marine Complex, out of the Strategic Marine yard at the Dong Xuyen Industrial Zone, Ba-Riang Vung Tau, in southern Vietnam.

Strategic Marine launched the base of the floating dock on 18 November, 2008. The 99m long and 53m wide base was then lifted aboard the Dockwise submersible vessel *Teal* for its eight-day journey to the AMC at Henderson in Western Australia. At time of writing, the shipbuilder had two months to fit the dock's 840tonne superstructure and four months to ensure all of the machinery works before handing the completed dock over in July 2009.

Strategic Marine also steered orders for two 143m diving support vessels and one well stimulation vessel from Singapore company Marfield Ltd to its Vung Tau facility, which covers some 136,500m^2 and now employs more than 1100 staff including fabricators, welders, production supervisors and management staff. Three slipways, with the largest being 152m long and 60m wide, are nearing completion, and a heavy fabrication area of 30,000m^2 is nearby. The yard is also building a 23.9m long compact tug from the Port of Napier in New Zealand – the company's first ever tugboat signing.

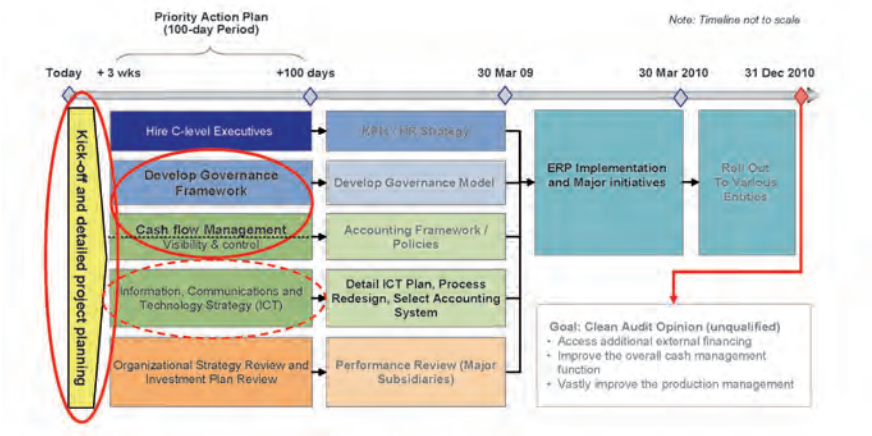
Other overseas interests have also set out their stall in the emerging shipbuilding country. In January 2007 Norwegian shipbuilder Aker Yards announced plans to build its own yard in Vung Tau. The yard is expected to deliver its first vessel in 2009 and will, in full operation, have an annual capacity of three to four vessels, dependent of vessel type and size. The Norwegian organisation owns 70% of the operation, while its partner is the Singapore company Amanda Group, which already has industrial experience in Vietnam.

Most recently, Aker Yards (now STX Europe) entered into a NOK1.5 billion contract with Aker Capital covering the building of six 3000dwt Anchor Handling Supply Vessels in Vietnam.

However, one would have to look back to 1996 to find the oldest overseas interest in Vietnam's present shipyard industry. It was then that South Korean company Hyundai Mipo entered a joint venture with Vinashin, initially by way of a shiprepair concern. The Hyundai-Vinashin Yard, in the southern province of Khanh Hoa, can accommodate vessels of up to 100,000dwt. It remains the largest repair-yard in Southeast Asia, but has latterly turned its attention to newbuildings,

As noted, Damen Shipyards of The Netherlands, has also last year entered the market. Under a joint venture agreement with Vinashin, a new yard is to be built in the Hai Phong area to target more specialised tonnage in the under 10,000dwt range. *NA*

Vinashin is looking to enhance efficiency through a root and branch reorganisation.



Record orderbook rattled by rising costs

Norwegian shipyards have orderbooks stretching as far as 2011 in some cases, but are struggling to make a profit. Some are struggling to survive, and others have already gone to the wall, and for the time being at least, orders have pretty much dried up.

"The current situation has a bright side, and a not so bright side," Birger Skar, managing director of the Norwegian Shipbuilders Association told *The Naval Architect*. "Compared with the same period in 2007, in the first nine months of 2008, order intake was down 75%, although 2007 was a very good year for orders," he explained.

"The orderbook tells its own story," said Mr Skar. "The good thing is that the orderbook is still fairly large; in January 2008 it was worth about NKr75(US$10.66) billion; it is still worth about NKr63 billion," he explained, speaking at the beginning of December.

"In the last six months, we have faced a completely different world economic situation," he said. Activity in the offshore support vessel market has slowed significantly, and now, the oil price has fallen sharply from its historic highs of mid-2008.

Of the around 160 vessels on order in Norway currently, some 80% are offshore vessels – increasingly these are very large offshore vessels, comfortably in excess of 100m, about which see more below – the remainder being ferries, live fish carriers, and seismic ships.

Why, then, given this huge orderbook, are so many Norwegian yards struggling? Solstrand shipyard went bust earlier this year, as did Flekkefjord; and at the time of writing, the fate of others, such as Karmsund Maritime, hung in the balance, whilst yards such as Kleven Maritime were rumoured to have been forced to seek loan agreements with their clients. The main answer to the question is increased costs; another is delays due to problems in the supply chain; but much of the problem with rising costs can be attributed, yards believe, to equipment manufacturers taking advantage of the recent worldwide order boom to drive up prices. That many vessels have been delayed is indisputable, but the situation is getting better as yards work their way through the massive orderbook.

And what will happen come early/mid-2011, when the current orderbook is completed? By 2011, Mr Skar believes, the OSV market will have come round again; and, in the meantime, yards may well find they have work that extends beyond mid-2011 because a good number of owners have either changed their orders for different vessel types, having first secured a slot at a yard, and because many others have requested modifications to the ships they have or order, hence delaying their completion.

"There continues to be some demand for ferries," said Mr Skar, "and there is a growing demand for larger live fish carriers. But there is nothing in terms of tankers or bulkers or anything of that type,"

And, as he admits, there is another potential problem for some yards, in as much as a good number of owners who have ordered OSVs have not been able to find finance for them to-date. Most at risk of being unable to find finance at all at the moment are owners who have ordered vessels speculatively, without a charter. How many vessels there are like this is not clear, but they are probably not few in number.

Speaking in November, Johannes Neteland, president of TTS Marine said he felt that, in his view, "pessimism had got the upper hand" in the Norwegian marine equipment market, and called on the Norwegian authorities to intervene to curb the extreme volatility of the Norwegian Krone.

TTS-Marine's accounts for the third quarter of 2008 showed another all-time high as regards turnover, results and order backlog, and, said Mr Neteland: "We expect the positive development to continue."

"According to our evaluation, pessimism has got the upper hand as regards the prospect for the future for both Norwegian and international economies," said Mr

Many Norwegian yards have large orderbooks; but some are struggling to contain costs.

Neteland. "TTS, like most other global companies, has challenges connected to the financial crisis and reduced growth of the world economy. But the gap is so vast between the positive development we are experiencing, and the general picture being painted of the future development of the economy, that it is prudent to shout a warning," he said.

Mr Neteland said he was of the opinion that the Norwegian authorities and Norges Bank (the Norwegian State Bank) have had "some success" in reducing the effects of the international financial crisis, but added that he believed that efforts to eliminate fluctuations in the exchange rate of the Norwegian Krone "had been too feeble."

"It is a fact that a weakening of the exchange rate of the Norwegian Krone generally is positive for the export industry," he explained. "But it is detrimental that the value of the Norwegian Krone in relation to the Dollar and Euro fluctuates from one week to the other. A number of contracts have exchange rates fixed at given levels. If these contracts are cancelled, and the forward currency position consequently has to be terminated, Norwegian companies risk considerable losses if the cancellation takes place at a point in time where the currency position is unfavourable." This, he said, was the gravest challenge Norwegian equipment manufacturers faced relating to the crisis.

Huge sums

In early December, in order to try to help owners and yards experiencing difficulties because of lack of access to credit, the Norwegian government injected huge sums of money into immediate support for building loans for ship guarantees and export credit guarantees, providing much needed breathing space, and hopefully enabling a number of projects and orders that were, effectively, on hold, to proceed.

"In periods of increased unrest in the markets, private risk capital is in short supply. Our objective is to be a supplement to the banks and to respond in a counter-cyclic way. This is particularly important in today's situation," said the Guarantee Institute for Export Credits (GIEK). "We are pleased that the Ministry of Trade and Industry has acted so efficiently in this case. Now we are able to process some of the projects that have had to wait because our framework has been fully utilised," said the GIEK managing director Wenche Nistad. The increase was, originally, proposed in the national budget for 2009, but Sylvia Brustad, Norway's Minister for Trade & Industry, said at the end of October that waiting for the budget resolution in December "was not an option," and credit problems in the financial markets meant the GIEK's framework needed to be increased immediately.

The boost to GIEK's framework came a matter of a few days after Eksportfinans entered into an agreement with the Norwegian government whereby the government provided Eksportfinans, the Norwegian export credit institute for export finance, with additional funding in order to ensure that Norwegian exporters would be able to obtain long term financing for their projects. *NA*

LNG supply foreseen in MAGALOG

Sea-Cargo's decision to invest in the Rolls-Royce design (see *p63*) has given a huge boost to the concept of LNG-fuelled vessels, but more needs to be done to ensure that the infrastructure is in place to support bunkers.

Only with the infrastructure in place can LNG become the 'fuel of choice' for shortsea operators, say the organisations that recently completed the MAGALOG project, which focused on the means of developing that infrastructure, with a final conference taking place in December.

In recent years, a number of ships powered by LNG have entered service in Norway, with more, mainly ferries, already under construction or planned. This being the case, the partners in the MAGALOG widened the geographical range of the project to include what is acknowledged to be one of the world's most environmentally sensitive sea areas in the world - the Baltic Sea - and widened the technical scope to include ferries, ro-ro and ro-pax vessels.

The MAGALOG project was initiated by the Norwegian gas and LNG supplier GASNOR and the Baltic Energy Forum, under the auspices of the Intelligent Energy Europe (IEE) programme. The project got under way in December 2007, with the first partner meeting and an international conference held in Bergen, Norway. Apart from GASNOR and the Baltic Energy Forum, the partners in the project include MARINTEK, the well known Norwegian marine research organisation; Hordaland Oil & Gas, based in Bergen, Norway; the Municipality of Świnoujście, Poland; and Stadtwerke Lübeck GmbH, in Lübeck, Germany.

The first LNG terminal dedicated to serving shipping is being planned for the MAGALOG partner city Lübeck, another is planned in Travemünde, and pre-investment studies have been made for Świnoujście, Poland. Another possible 'start point' for LNG terminals at which ships could be bunkered with LNG is the Hordaland region of Norway.

The participants in the MAGALOG project say they believe that MARPOL Annex VI be a significant driver for the uptake of LNG as a fuel, and that limits on sulphur emissions will make LNG an ever more attractive option.

Apart from the environmental benefits of burning LNG, those involved in the MAGALOG project also believe that it has another potential benefit in as much as that known reserves of LNG are expected to outlast crude oil (research by BP suggests that oil reserves might last another 40 years, whereas proven gas reserves could be sufficient to last another 60 years – estimated reserves suggest there may be enough gas for 130 years). *NA*

The Royal Institution of Naval Architects

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11th-14th May 2009

By Joe Stiglich

This four day course covers the fundamentals and calculations of dry docking. The course begins with the basics and safety concerns, and progresses through all phases of dry docking: preparation, docking, lay period, undocking, and ends with a discussion of Accidents and Incidents.

It's designed to be relevant to Dock Masters, Docking Officers, Engineers, Naval Architects, Port Engineers and others involved in the dry docking of ships and vessels. The course is presented through classroom lectures, student participation in projects and practical application exercises. The course addresses the deck plate level of practical operation needed by the dock operator and the universally accepted mathematical calculations required to carry out operations in accordance with established sound engineering practices.

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- Safe dry docking procedures
- Lay period
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- Hull boards
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- Incidents/accidents

About the Course Leader: Joe Stiglich is a retired Naval Officer, qualified NAVSEA Docking Officer and holds a Masters Degree from MIT in Naval Architecture and Marine Engineering. He has been responsible for over 250 safe docking and undocking operations. He currently runs a series of conference and training courses for personel involved in all phase of the drydocking industry and acts as a consultant for ship repair companies.

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Shortsea ships use gas to go green

Rolls-Royce recently secured contracts for the design of gas-fuelled vessels which take the concept of LNG propulsion to a new level.

LNG is already used to power several Norwegian Platform Supply Vessels (PSVs) and ferries, but Sea-Cargo in Norway recently ordered what are believed to be the world's first cargo vessels to be fuelled solely by LNG which have a simple mechanical drive propulsion system.

On delivery from the Bharati shipyard in India in 2010, they will operate on a 10 day round trip service covering Baltic, Norwegian and British ports, bunkering gas fuel at one location. They are a major breakthrough, both in the application of LNG fuel for merchant vessels, and in the way the simple Rolls-Royce solution works. An important end result will be a very large reduction in emissions compared with a similar ship using liquid fuel. CO_2 emissions will be reduced by about 20% NOx by about 90%, particulates are negligible and sulphur oxide emissions will be zero.

The new 132.8m long Sea-Cargo vessels will be able to carry 5600tonnes of cargo on a draught of 6m, with up to 94TEU of containers on deck and 1140 lane metres of ro-ro capacity. Rolls-Royce is responsible for the overall vessel design, derived from Sea-Cargo's long experience with coastal and shortsea shipping, and will supply all the major equipment and systems including main engine, reduction gear, propeller, shaft generator, tunnel bow thruster, rudder and steering gear, automation, and the LNG fuel storage and handling system.

"With the new regulations for gas fuelled ships now in place, we are now seeing an increasing demand for our products and technology in this field," said Rolls-Royce. "We are well positioned through our specialised teams to take an increasing market share for complete gas installations in a variety of vessel applications, everything from the bunkering flange to propeller thrust."

Because the Bergen B35:40V12PG main gas engine is classed for the load/speed operational pattern that comes with mechanical coupling to a controllable pitch propeller, a simple single engine propulsion system has been possible in the Sea- Cargo ro-ro vessels – conventional in all but the fact that LNG is the fuel.

Cold liquid gas will be stored in two insulated flasks forward of the engine room, in a ventilated enclosure offset to one side to clear a vehicle ramp. This space will also house the evaporator system that converts the liquid into a low pressure warmed gas and supplies it to the gas engine, which turns the propeller through a reduction gear. The engine also supplies the vessel's electrical load by means of a generator driven off the gearbox.

The Bergen engine uses the proven Rolls-Royce spark ignition lean burn combustion technology that is the key to obtaining a very high thermal efficiency, together with good load and speed control in a gas-fuelled engine.

"We have an agreement that Hamworthy Gas Systems will be our preferred partner for LNG storage and handling systems. This means that in addition to these ro-ro vessels, Rolls-Royce can offer LNG propulsion systems for a wide variety of ship types, together with designs and deck machinery, manoeuvring and automation systems," said Rolls-Royce, noting that it has assisted classification societies and authorities over the past few years in developing safety rules for LNG-fuelled vessels, based on the company's experience with gas engines, where more than 400 are now in service on land and at sea. *NA*

Sea-Cargo's new LNG-fuelled vessels will be able to carry 5600tonnes of cargo on a draught of 6m, with up to 94TEU of containers on deck.

LMG Marine designs 'hotel at sea'

Norway-based Polycrest has joined the growing number of owners investing in the construction of monohull flotels, and has ordered a newbuild vessel to be built in Spain to a design by Norwegian naval architects LMG Marin.

Polycrest has decided to invest in a 'ship-shaped' flotel and service vessel based on a design which is 125m long overall, being arranged with a large accommodation block forward and a large cargo/working/shelter deck aft. The main role of the ship will be to provide accommodation facilities for up to 350 offshore personnel; the capacity includes cabins for up to 30 catering personnel and 20 marine crew, but important assets will be workshops and indoor storage facilities for clients. The vessel will also be equipped with a knuckleboom crane.

LMG Marin is designing this accommodation and service vessel for Polycrest.

When in service, it will be able to hold a position adjacent to an FPSO, rig or fixed installation using a fully redundant dynamic positioning system. Access for embarkation of offshore personnel between the ship and platform/FPSO will be provided by a telescopic gangway of as yet unspecified type (readers will be aware that there are a number of offshore access systems currently under development).

Equipped to DP Class 3 standard, the new ship will have a diesel electric propulsion system based on a quartet of 3700kW gensets, providing current at 6.6kV and 60Hz. This plant will supply power to a pair of 3500kW thrusters aft, two 1500kW tunnel thrusters forward, and a 1600kW retractable thruster, also forward. A firefighting system to FiFi II standards, with two monitors, will be fitted atop the wheelhouse to the portside.

The subsea knuckleboom crane will have a winch with 100tonne capacity, single line, with 2000m of wire, with a SWL of 150tonnes at 10m or 10tonnes at 33m. The large, telescopic gangway system for embarkation of offshore personnel will have a maximum range of 43m.

The large main deck will provide space for storage and work, with a weathertight hatch accessing a large work/storage deck below of 900m^2 and of sufficient height to allow movement of containers. A sheltered under-deck workshop of 220m^2 will be available for carrying out repairs to electrical components, and provide space for machine, welding and pipe shops. There will also be a large storage hold aft of the engine rooms, plus container lay down and securing points on deck and deck outlets for electrical power, water and air. A helicopter deck will be suitable for a Sikorsky S92 or equivalent, and the accommodation will be well insulated against the main machinery, giving very low noise and vibration levels. All cabins will have their own WC, washbasin and shower, and a large number of cabins will have windows. The accommodation will also be equipped with suitable air conditioning and ventilation.

A contract to build the ship has been placed with Factorias Vulcano in Vigo, Spain for delivery early in 2010. Few details of equipment suppliers have been announced as yet, although it is known that Skamek Power has entered into contract with Vulcano to provide four General Electric diesel gensets. *NA*

Autronica comes through the mist

Trondheim-based Autronica Fire and Security has released details of its new fire extinguishing system, which features a water mist nozzle for the FlexiFOG water mist system.

The solution, characterised as 'less is more' by the company, is a micro water mist system designed to protect public spaces, cabins, corridors and storage areas, based on a water mist fire suppression system that is said to be easy to install and weighing less than conventional systems.

Autronica said FlexiFOG micro has been designed to use less power and less water than alternatives. "The pump pressure of the FlexiFOG micro accommodation water mist system is only 20% that of similar high-pressure systems, and in combination with its low water consumption, the power consumption is reduced with more than 50%," said the company.

In terms of weight, the company said that, on a medium sized ferry with approximately 1500 nozzles, installation of the system provided a weight reduction of approximately 2tonnes. The system also requires less space, with the back-up tank for one minute operation covering 280m^2 reduced by more than 70% compared to traditional sprinkler systems. The company also claims that the weight of the zone valves is reduced by more than 50% compared to other low-pressure systems. The nozzle can be flush mounted, and client-specified colours mean it can also be adapted to any surrounding environment.

"By utilising a press fittings pipe system, installation costs will be reduced by approximately 25% compared to traditional piping," said the company. *NA*

Schat-Harding launches mega lifeboat

Lifeboat and davit manufacturer Schat-Harding is developing a 370-person 'mega lifeboat' and davit system, which it claims marks a step change in safe evacuation of large cruiseships.

The new CRW55 lifeboat and specially designed LS45 davit from Schat-Harding is more than double the capacity of existing lifeboats, which until now have been limited by SOLAS regulations to a maximum of 150 persons per boat.

"These revolutionary boats and davits have been specially designed for the RCCL Genesis project ships which are being built at Aker Yards," explained Endre Eidsvik, executive vice-president Schat-Harding equipment division. "We have worked in close co-operation with Aker Yards, RCCL, GL and DNV to find a way to improve the safe evacuation of the up to 8400 passengers and crew sailing on these ships. This boat will be built and tested under the procedure for alternative design set down in SOLAS by IMO, as pr. DE 49/4/1 Annex 5 and 6 for the purpose of demonstrating the equivalent level of safety as per SOLAS Ch. I/5 for lifeboats with capacity beyond 150 persons. Final approval and certification are based on a formal approval statement from NMD, acting for the Bahamas Administration."

Schat-Harding's 370-person CRV55 lifeboat on test at sea.

Schat-Harding believes the new lifeboats will be safer and quicker to board for large numbers of passengers, easier to get away from the ship as the davit does not have to move, and will be safer once in the sea as they have twin engines. "This system is the nearest possible thing to a 'pull and go' evacuation system on a cruiseship yet designed," said Mr Eidsvik.

The CRW55 boat is built on a catamaran hull 16.7m long with a breadth of 5.6m, giving excellent stability. Built from Fibreglass Reinforced Polyester (FRP) using a vacuum technique, the boat will weigh 17tonnes in the stowed condition and 45tonnes when fully loaded with 370 passengers and crew. Two 70hp diesel engines will give the boat a speed of 6knots and twin rudders will give excellent manoeuvrability. There is also space for two stretchers in the wheelhouse and a toilet onboard.

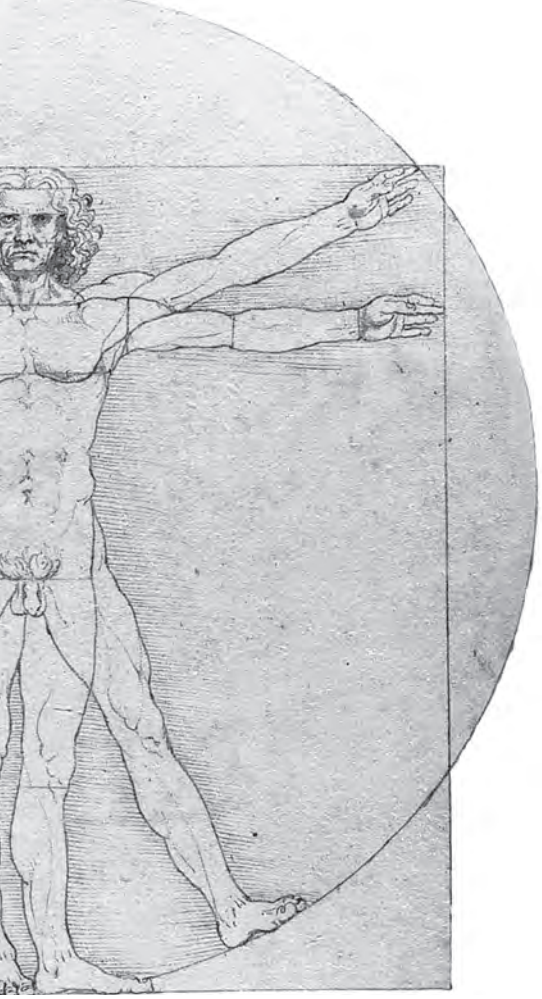
The seating is arranged on two levels, ergonomically planned for speedy boarding. 280 persons will be seated on longitudinal seat benches arranged on the cabin deck, 80 persons at the upper seat level, between the longitudinal seat rows, and 10 persons will be seated in the large steering tower near the helmsman's position. All walking areas in the cabin will have non-skid surfaces and all the seating is within a self-draining inner skin.

The boats will be stowed and launched from a specially designed LS45 davit which is designed for direct lowering of the lifeboat from the stowed position, cutting out the need for swinging out. The boat will hang from two LHR-type 25tonne wear-less cam system quick release hooks which are simple to operate and which have clear visual indication of when locked or unlocked. Lashing and bowsing are integrated and embarkation is at the stowed position through four colour-coded doors leading to ergonomically planned colour-coded seating areas. The winches are designed with a retraction system to lift the lowering block free from the boat canopy and a retardation function to reduce forces on davit, winch and lifeboat hook when stopping.

"Speed of boarding, simplicity of operation and maintenance, and a high degree of safety have been designed into the system," said Mr Eidsvik. "Each of the Genesis vessels will be fitted with 18 of these boats. They mark a step change in safe evacuation of large ships and could not have been designed without the excellent co-operation from the concept stage with Aker Yards, RCCL, GL and DNV. The prototype testing is underway, and the boats will be in full production at Umoe Mandal during 2008. I believe this is the first of a whole new generation of very large lifeboats and a very safe way to evacuate big cruise liners."

Schat-Harding is also working on a new generation freefall lifeboat for the offshore industry. The FF1200 boat and matching davit will have a capacity for up to 70 persons and will be suitable for drop heights from platforms and other offshore units up to 33m above sea level in extreme conditions.

The unique feature of the new design is that it meets all the new OLF (The Norwegian Oil Industry Association) design criteria for lifeboats in the Norwegian offshore sector, which leads the world in offshore safety standards. Compared to all existing lifeboat designs the FF1200 has additional clearance inside the boat for safety and comfort with a more streamlined shape and powerful engine to give better headway in waves. *NA*



Human Factors in Ship Design and Operation

25-26th February 2009, RINA HQ, London, UK

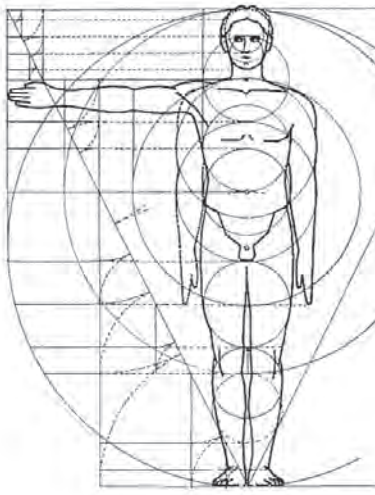
Second Notice

The work of naval architects and marine engineers directly influences the operability and safety of the vessel and the wellbeing of the seafarer. Design decisions can influence human behaviour. An improved understanding of ergonomics by engineers can 'design out' hazards and prevent pollution incidents. The shortage of seafarers can be mitigated by design for improved habitability and better operation with lean manning

With ever more complex systems and technology greater improvements in safety can be achieved through a better understanding of human/system dynamics. A greater awareness of the role played by management structures, culture, procedures and regulation in safe and effective operation.

This conference aims to bring together international specialists and professionals including designers, ship operators, seafarers, equipment manufacturers and regulators to highlight how an improved understanding of human factors can reduced costs and improve safety.

- Integration of human factors into the design process
- Examples of practical applications of human factors engineering
- Feedback from the users into the design loop
- Survivability, escape and evacuation systems
- Design of navigation & control systems
- Maritime operating organisations and teamwork
- Safety performance and management
- Design for occupational heath and safety
- Habitability



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Design group fits into Wärtsilä

Vik-Sandvik Group, the well known firm of Norwegian naval architects that also includes Skipskonsulent, was acquired by engine builder Wärtsilä in 2008, and is now part of a ship design group within Wärtsilä that also includes the former Schiffko in Germany and Conan Wu in Singapore.

Wärtsilä is now able to offer a full range of ship design disciplines and expertise in a wide range of vessel types to complement its expertise in engines and machinery.

Explaining some of the rationale behind Wärtsilä's move into ship design and the acquisition of Vik-Sandvik, Jakko Eskola, group vice president, Wärtsilä Ship Power, noted that the role of ship design had become increasingly important in the value chain as the level of integration and sophistication in new vessels grew, as new stricter environmental regulations were introduced, and as shipowners increasingly demanded more fuel efficient vessels.

"By offering ship design, Wärtsilä is linked closer to its maritime industry customers, and intends to offer the best and most efficient total solutions," he said. "Wärtsilä's total solutions serve to integrate and optimise the various operating processes of the entire vessel, and new and innovative ways of combining ship design know-how with equipment provision and services will lead to significant customer benefits.

"Increasingly ship design is linked to the operations of system providers, yards, and integrators." Moreover, he pointed out, there is a general trend towards globalisation of independent ship designers. "European shipowners are looking to Southeast Asia for the construction of their vessels, but still with European designs. Ship production is moving away from traditional western shipbuilding countries to emerging markets, where in-house skills are less well developed. This new and innovative way of combining ship design know-how with equipment solutions and services will lead to significant customer benefits in terms of improved efficiency and reduced emissions."

As Mr Eskola also noted, for an engine builder – or another supplier of key items of equipment, but particularly an engine builder – involvement in ship design is key to early entry and full life-cycle presence.

From the left: Jakko Eskola, group vice president, Ship Power, Wärtsilä Corp, Arne Birkeland, president, Wärtsilä Norway and vice president, Ship Design, Ship Power, Wärtsilä Corp and Svein Sandvik, managing director, Vik-Sandvik AS.

Egil Sandvik, head of sales at Vik-Sandvik Wärtsilä Ship Design, said that Wärtsilä sees ship design as a part of the 'total solution'. He noted that in recent years there has been a shift from a focus on deadweight to a focus on more efficient transportation of cargo; whereas he noted, a standard shipyard design has a focus on production cost and deadweight alone. By optimising vessel design and propulsion, significant reductions in fuel consumption can be achieved. "Reductions of up to 25% are possible," said Mr Sandvik.

Wärtsilä has also announced details of a number of major vessel orders in the OSV market won via Vik-Sandvik, including new contracts from China and India that, said Mr Sandvik, "represented a breakthrough for modern high-end offshore vessels in a region that we all believe will be an important market." The orders call for Wärtsilä to design a deepwater survey vessel, a multi-purpose support vessel, a DSV and an emergency towing vessel.

In addition to the new orders, the Wärtsilä Ship Design unit has also recently completed designs for a new anchor handling vessel, a PSV, and a bulk carrier, all of which afford fuel consumption reductions of as much as 25 per cent. This has been made possible by optimising the design to accommodate each vessel's operating processes.

Looking to the future, Mr Sandvik said Vik-Sandvik will continue to focus on LNG-fuelled vessels, noting that the first four offshore vessels powered by LNG are now in operation to Vik-Sandvik design, with Wärtsilä engines, and the first three coastguard vessels with LNG are also of Vik-Sandvik design. "The time has come for fuel cells," Mr Sandvik said, highlighting the fact that, under the FellowSHIP project, a fuel cell will be installed on an offshore vessel in the next 12 months. *NA*

The self-propelled jack-up

Master Marine in Norway has come up with an innovative solution – a jack-up barge with its own propulsion system.

Master Marine specialises in transportation and installation of heavy structures for the offshore oil and gas industry, and has two self-propelled 'Service Jack' jack-up vessels under construction to its own design in Indonesia. The concept was developed with heavy lift and decommissioning work primarily in mind, but the first contract for a Service Jack sees the vessel being fitted out as an accommodation vessel.

Interest in a new generation of hybrid jack-ups that combine features of a vessel and platform, which are fitted with thrusters and thus capable of being deployed without the assistance of tugs is growing. Obvious benefits result from the concept. The Service Jack concept combines features such as a very high level of stability when fixed in position with its legs deployed, with the ability to relocate itself, thus obviating the need for anchor handling and towing vessels and driving down operating costs.

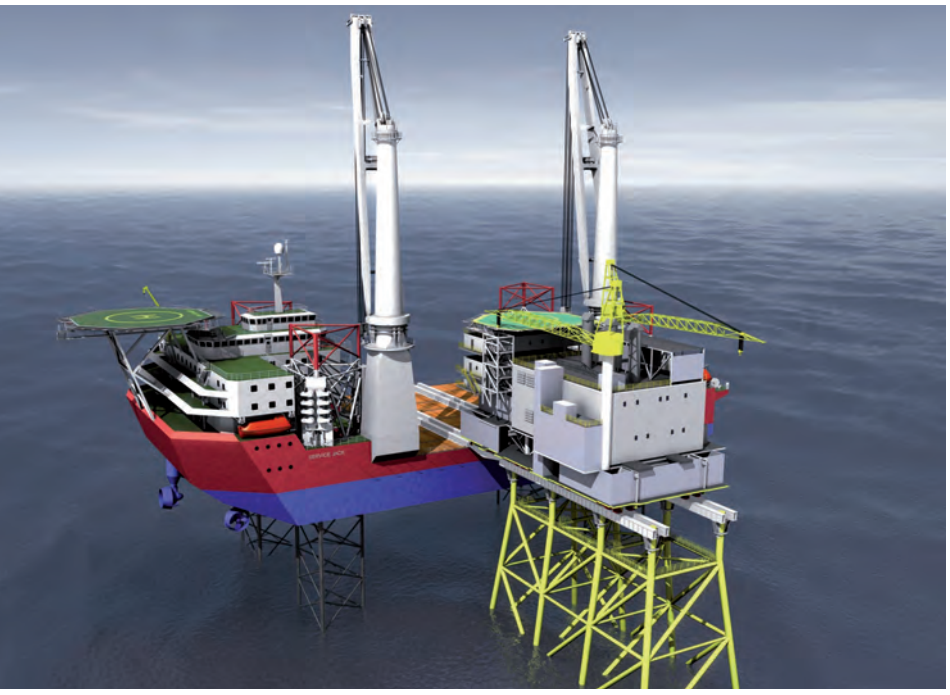
The first example of a Service Jack is due to be delivered in the first quarter of 2010, with a second following in the third quarter of that year. Two more vessels are the subject of options in the contract awarded by the Norwegian company, and in late October Master Marine also announced that the first unit – *Service Jack 1* – has already been awarded a contract, with ConocoPhillips Scandinavia, for the Ekofisk Renewal Project.

By utilising the extensive free deck area available on a jack-up, *Service Jack 1*'s already substantial accommodation capacity has been increased from 260 beds to 447. In addition, the vessel will be outfitted with recreation areas, offices and workshops.

On *Service Jack 1*, the two large revolving cranes that form part of the concept will be replaced by a smaller crane, making the vessel more suitable as an accommodation unit. Once in service, it is due to replace some of the existing accommodation vessels/platforms on the Ekofisk complex and, in addition, will serve as a support vessel for the upcoming 'Greater Ekofisk Area' offshore campaigns.

The second vessel, *Service Jack 2*, is expected to be constructed as a construction unit with the capacity to perform topside and jacket installations by tandem lift (up to 1500tonnes revolving crane capacity) or single lift topside installations by skidding (up to 7200tonnes capacity). *NA*

The Service Jack jack-up is self-propelled and can relocate without assistance from tugs.



Helseth invests in new production facilities

One of Norway's oldest propeller manufacturers, Helseth AS in Molde, has recently completed construction of a new production hall designed for production of the company's new SX Series propellers.

Helseth is mainly known for propellers for low noise and high-speed applications for smaller vessels, and custom-produces propellers for special ship types such a recent series of Russian Register Ice Class 5 tugs built by Amur Shipyard in Russia.

Having completed development of the new SX Series, Helseth says it is now well placed to deliver propellers with a diameter of up to 4.5m for a range of vessels, including offshore support vessels and many kinds of shortsea ships.

Helseth in Norway is moving into propellers for larger vessels with its new SX Series.

Follow-on specialist vessel ordered

Island offshore vessel is first of new high comfort class.

Rolls-Royce is to design and equip a highly specialised vessel for a Norwegian owner, in the shape of a new type of well intervention vessel for Island Offshore. The order follows the delivery of the UT767CD Island Wellserver in March of 2008. Built in accordance with Well Intervention DNV class with dynamic positioning DP 3, DYNPOS-AUTRO standard, the vessel also meets Clean Design and Comfort V (1) C (1) classes and is the first offshore vessel to achieve such a high comfort class.

The new 130m UT 767CDL vessel will be 14m longer than her sister and is designed to similar standards to service subsea wells in ultra deep waters, with accommodation for 97 people in single cabins. Diesel electric propulsion with azimuthing thrusters for main propulsion has been specified. Rolls-Royce will also supply the vessel's anchoring and mooring winches, tugger winches, switchboards, bridge and engine control room consoles and the automation system.

Rolls-Royce is designing another well intervention vessel for Island Offshore, a UT767 CDL.

The deck will be dominated by a module handling tower to launch and retrieve the intervention equipment by utilising a guiding system through the splash zone. A large working deck area has been specified, so that equipment can be handled horizontally on skids. A large crane provides the heavy subsea lifting capability and there is an area of low bulwark aft to facilitate lifting equipment over the stern. Aker Yards in Norway will build the vessel, which is scheduled for delivery in 2011. This contract brought the total of Rolls-Royce UT vessels under construction worldwide to 120. *NA*

The Royal Institution of Naval Architects

Design, Construction & Operation of Super and Mega Yachts

April 2009, Genoa, Italy

Second Notice

This international conference follows a continuing series of successful RINA conferences on the design, construction and operation of sailing and motor yachts. However, this is the first conference to focus on the unique aspects of super and mega yachts.

The growth of demand for luxury motor and sail yachts has increased rapidly in recent years. This has only been matched by the increase in size and complexity of vessels being designed and built. Existing definitions of what constitutes a super yacht seem outdated, with vessels in excess of 150m already built. This growth in size and complexity coupled with the new technologies becoming available bring new challenges requiring innovative solutions.

Today's clients are requiring ever greater levels of comfort and luxury, not only in terms of the vessel fittings and styling but also in the vessels behaviour whilst underway and at anchor. Many vessels are now used for charter and this has implications for the way in which the vessel is designed and classed.

The conference will cover all aspects of large sail and motor yacht design, construction, and operation, from designers, researchers, manufacturers, operators, and regulators. Topics will include the following:

- All Aspects of Design – Hull, General Arrangement, Interior, Features etc.
- Operation
- Regulation & Classification
- Powering & Propulsion
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Larger steps from Marin Teknikk

Specialised design company continues to benefit from offshore's building boom.

Marin Teknikk recently signed contracts for a number of large offshore support vessels, among the latest being a contract with PT Batamec shipyard in Indonesia, for delivery of design and engineering packages for two DP 3 MT6022 XL well intervention and offshore construction vessels. The vessels are to be built for unspecified Norwegian and Singaporean owners.

The new vessels are intended for worldwide operation, including in the North Sea, and will have a length overall of 115.4m and beam of 22m. A strengthened working deck (10t/m^2) of 1,200m^2 and a large moonpool are arranged amidships, with a derrick arranged over the moonpool for drilling and handling of offshore modules for installation work on the seabed. They will also have two ROV hangars for Work class ROVs and one for an Observation class ROV.

The accommodation is arranged for 116 persons with offices, lounges, conference rooms, and ROV control rooms. Atop the wheelhouse a 'sky lobby' is arranged with reception for passengers arriving via helicopter, landing on a large 26.1m diameter helicopter deck which is suitable for a Sirkorsky S-92.

The vessels are also equipped with a large offshore crane for lifting modules, with lifting capacity of up to 150tonnes at 12.4m, which are able to work at a depth of 2500m, plus a cargo rail crane, with capacity of 5tonnes at 19m radius. Delivery is planned for summer and autumn in 2011.

Also newly designed by Marin Teknikk and to be built by a South Korean shipyard for delivery to Gulmar Offshore are two MT 6024s. These multipurpose offshore construction and dive support vessels are designed for operation in the Middle East Gulf and Indian Ocean, in addition to the North Sea.

The MT6024s will have a length overall of 121m and beam of 25m, and will also have a strengthened working deck (10t/m^2), of 1300m^2, located aft of the dive area, a mezzanine/ROV deck of 240m^2, and a open deck space area of 250m^2 aft of bridge deck, plus accommodation for 130. The contract also includes a diving system for 18 divers, who can operate in two different teams at same time. The vessels are arranged with two of separate diving moonpools, in addition to a third larger moonpool for construction work. *NA*

CleanHull cleans up

Many shipowners today are opting for 'soft surface' silicon-based antifouling coatings. They give good results in service, but are easily damaged, especially by rough brush cleaning. This being the case, CleanHull, part of the Schat-Harding Group, is working with Jotun Paints to test the action of the CleanHull brushless system on silicon antifouling panels in the workshop.

Recently, CleanHull's team was awarded a contract to clean the silicon antifouling of the 56,885dwt gas carrier *BW Challenger*. The whole clean up was monitored by a representative of Jotun. The 6000m^2 hull was cleaned in 10 hours with no damage to the coating, proving CleanHull in practice, suppliers say.

Brunvoll completes first FU74

New range to complement existing Brunvoll offering.

Brunvoll AS in Norway recently completed development of a new thruster unit. The FU74, said to be the first unit of this type, recently completed factory tests and has been delivered. The unit has a propeller diameter of 2.0m and is available with a power range of up to 1450kW.

The FU74LTC2000, which is the notation for the new tunnel thruster configuration with L-drive and controllable pitch propeller, will complement the existing Brunvoll thruster range. In terms of size and power range the unit will be in-between the FU63 and the FU80.

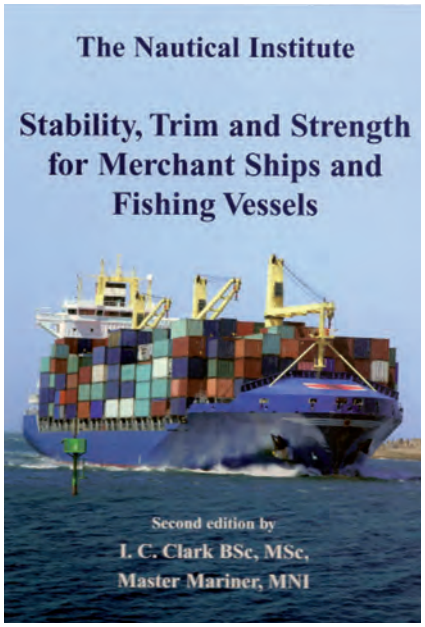
Brunvoll AS already has 36 units of the new thruster type on order. *NA*

Brunvoll has 36 examples of the new FU74 thruster unit on order.

Stability, Trim and Strength for Merchant Ships and Fishing Vessels

E. C. Tupper

Stability, Trim and Strength for Merchant Ships and Fishing Vessels
By I. C. Clark, published by The Nautical Institute as a hardback, 2008, 440 pp. ISBN 1 87 00 77 87 3, £65.



The author started his sea-going career in 1969 but left the sea in 1978 to spend 12 years as a secondary school physics teacher. He returned to sea in 1990 as first mate on small survey ships gaining his Master's Certificate in 1992, since when he has worked mainly on off-shore support vessels. He has a BSc in Nautical Studies and an MSc in Marine Geotechnics.

This book is a new edition of The Management of Merchant Ship Stability, Trim and Strength, published in 2002. It is a sister volume to the author's Ship Dynamics for Mariners, also published (2005) by the Nautical Institute. Compared with the earlier edition it is much expanded with almost 50% more pages. Also fishing vessels are now covered in their own right.

In common with his other book this edition retains the same somewhat unusual presentational format, making extensive use of line diagrams, many coloured, and with the associated text on the same or adjacent page. This makes for clarity of reading and easy subsequent reference to subjects of interest.

Thus it can be used by students as a text book and by the practitioner as a reference book. As the author says, it is easy to forget the detail of a topic some years after studying it.

"The author is to be congratulated on this latest work and we look forward to seeing his definitive guide on mooring, on which he is now working."

The book covers matters which are of great importance to the safety of ships at sea. Apart from features which are intrinsic to the design and the environment in which the ship is operating, these matters depend upon the material condition of the ship, how it is loaded and how managed.

Author's assistance

The author has set out to assist ships' officers and operators in their understanding of the behaviour of ships at sea. It covers all the stability and trim topics covered in examinations for certificates of competency for deck officers.

The book also covers the relevant regulations of the International Maritime Organisation (IMO) and other bodies. Indeed about a quarter of the book is devoted to regulatory matters.

The author has tried to give an understanding of the underlying intent of such regulations which is as important as the specific wording. As he says, whilst regulations are needed and can be good, they can lead to an attitude on the part of designers and owners in meeting the letter of the regulation rather than caring for the safety of the ship and crew which should be the aim.

The first three chapters deal with hull form, forces acting on it, sea waves and a ship's stability. Then two chapters deal with how transverse stability is affected by weight distribution, ship operations and the environment, including icing. The next chapter covers longitudinal stability, trim, docking and stranding. Two chapters are devoted to motion in waves and strength and the next explains how stability and trim can be calculated after water has entered due to damage.

The final two chapters outline SOLAS, MARPOL and Load Line regulations. Eleven appendices deal with some supporting matters. It will be clear that, although written primarily for seagoing officers, the book will also be a useful reference work for naval architects and others associated with the operations of ships at sea.

The author is to be congratulated on this latest work and we look forward to seeing his definitive guide on mooring, on which he is now working. *NA*

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THE INTERNATIONAL CONFERENCE ON COMPUTER APPLICATIONS IN SHIPBUILDING (ICCAS 2009)

The Royal Institution of Naval Architects

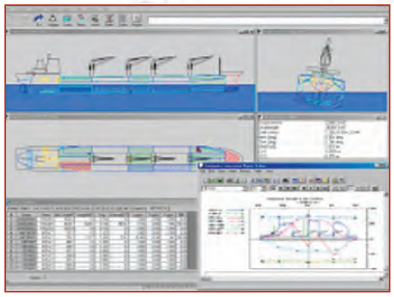
Organised by
The Royal Institution of Naval Architects
and
Shanghai Society of Naval Architects and Marine Engineers

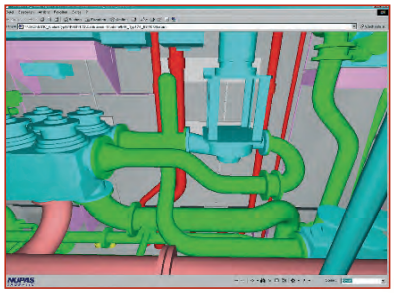
上海市造船工程学会 SSNAME

1-3 September 2009, Shanghai, China

First notice & Call for Papers

SHIPBUILDING
ICCAS
Shanghai • 2009





ICCAS 2009 will be the 14th International Conference on Computer Applications in Shipbuilding. The 2009 conference will be held in Shanghai, from 1-3 September 2009.

The conference will review operational experience from existing computer applications in the design and build of ships and offshore structures. It will also examine the advances in Information Technology which have contributed to increased productivity in both shipbuilding and maritime operations; including increasing co-operative working between shipyards, marine equipment and system manufacturers, engineering partners and shipping companies.

The conference will cover the full range of topics related to computer applications, including separate programs, integrated systems, knowledge management, simulation and virtual reality applications, for:

- Early design, including concept design, tendering, initial design, general arrangement, cost and work estimation, hull form, hydrodynamic analysis and basic structural design, risk based design
- Detailed and production design, including structure, machinery, hull and outfitting design
- Parts manufacturing and assembly, including prefabrication, shop automation, robotics, assembly and accuracy control
- Material management, including material control, supply chain management, logistics and e-solutions
- Management of shipbuilding projects, including planning, work-flow analysis, PDM and ERP applications
- Commissioning, inspection and maintenance, including life-cycle maintenance, life-cycle cost management, environmental cost management, parts and systems reliability, inspection standards and risk management
- Skills management, knowledge transfer and other human resource issues
- Innovation, innovation management and innovation impact assessment, including new materials and eco design

Papers are invited on the topics to be covered by the conference. Such papers should focus on advances made in information and communication technology with respect to methods, tools, standards and organisational adaptations in the different application sectors of the shipbuilding industry. Where appropriate, papers should also describe the potential impact of the innovation described to productivity improvements.

The conference will attract a large international audience and provide a forum and means of professional development for all parties interested in computer applications in shipbuilding.
Key dates and up to date information will be displayed on the website at:
www.rina.org.uk and www.iccas-conferences.com

☐ I would like to offer a paper and attach a synopsis of no more than 250 words by 06/03/2009

☐ I wish to receive details on exhibition space and sponsorship opportunities

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Name: _____ Position: _____

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The World Superyacht Awards

Young Designer of the Year 2009

A prestigious award for talented young superyacht designers is to be awarded at the Boat International Group 2009 World Superyacht Awards

The Royal Institution of Naval Architects, the Boat International Group and Camper & Nicholsons International invite entries for the 2009 World Superyacht Young Designer Award competition.

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

The World Superyacht Young Designer Award will be presented to the winner of the competition at the World Superyacht Awards ceremony in April 2009, at which the remarkable ingenuity and innovation demanded in the design, engineering and construction of the world's finest luxury yachts is demonstrated, and is the most obvious place for new designer talent to be recognised and celebrated.

The Royal Institution of Naval Architects

BOAT INTERNATIONAL MEDIA

Camper & Nicholsons International

The Competition

The competition is open to anyone who is studying for a degree or vocational qualification in a subject relating to yacht or small craft design,or anyone who has already graduated within three years of the closing date for entries, which is 31 January 2009.

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

The Award

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

The sponsor

The Award is organised by the Royal Institution of Naval Architects and Boat International Group, and is sponsored by Camper and Nicholsons International: 'Following the joint Camper & Nicholsons International – Boat International initiative three years ago to reward the work of yacht designers and naval architects, we thought it was only natural to continue to collaborate with the Boat International Group and RINA in order to identify the young designers of the future, 'says Camper & Nicholsons International's CEO Jillian Montgomery. 'Taking an active part in this competition prepares the grounds for the future in many ways. Firstly, by giving up and coming designers exposure and the opportunity to get in touch with potential clients, and secondly by offering our existing and future clients a glimpse of designs that could soon be on the drawing boards, 'explains Laurent Perignon, director of marketing for CNI.

The closing date for entries is 31 Jan 2009. If you are interested in submitting an entry or would like more information, contact Giuseppe Gigantesco, E-mail: ggigantesco@rina.org.uk, Tel: +44 (0)20 7235 4622
The Royal Institution of Naval Architects, 10 Upper Belgrave Street, London, SW1X 8BQ The rules for the competition can be viewed at www.rina.org.uk/wsyaward

RINA publications

Books

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BUSINESS FUNDAMENTALS FOR ENGINEERS
By Professor Chengi Kuo FRINA Ref BFE01
This book deals with essential business topics, so often treated in a specialised and lengthy way, as related to practical engineering situations. Eight chapters cover: business and the engineer; fundamental elements of business; markets; management; money; manpower; case examples; and application. This volume provides engineering students and practising engineers with an affective and well-integrated introduction to business.
Member price: UK £27.00 EUR £28.00 OVS £32.00
Non-Member price: UK £28.00 EUR £29.00 OVS £33.00

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The need for shipboard maintenance in an age of the principles of International Safety Management (ISM) has never been more important. If the industry is to operate at all it must be within the safety guidelines. Many shipboard tasks fall inside the planned maintenance programmes which can be conducted on a day to day basis but many of the annual tasks required to operate ships tend to accumulate and can only be catered for within a docking scenario. Over 100 Photographs - Numerous diagrams and check lists. Listing of Dry Dock operations, handling facilities, main ship builders and repair yards.
Member price: UK £37.00 EUR £42.00 OVS £46.00
Non-Member price: UK £40.00 EUR £45.00 OVS £49.00

EVER THE APPRENTICE
By Kenneth Rawson FRINA Ref: ETA
This book recalls a time and way of life which are beginning to fade from memory. Kenneth Rawson saw major changes in society from a hangover of Victorian attitudes through his war experiences. He provides wonderful snapshots of life of life lived against a backdrop of historical events. He won a scholarship into the body responsible for the design of all warships for the Royal Navy thereby satisfying an intellectual endeavour and a deep love of the sea and ships. He was recognized in 1996 by the University of Portsmouth with the award of Doctor of Engineering, Honoris Causa.
Member price UK £15.45 EUR £16.45 OVS 18.95
Non-member price UK 17.45 EUR £18.45 OVS £20.95

MERCHANT SHIP NAVAL ARCHITECTURE
By Dr DA Taylor FRINA & Dr Alan ST Tang MRINA
Ref: MSNA
This new and up-to-date book defines a ship and its parts, the methods used in calculating the areas and volumes of ships hulls (with worked examples), followed by chapters on Buoyancy, Stability and Trim; Ships and the Sea; Structural Strength; and Resistance, featuring the use of model testing and its relationship to full scale ships. It also features Propellers and Propulsion Manoeuvring and Motion Control; and Vibration, each of which is described from the first principles through to various formulas used in necessary calculations.
Member price: UK £36.50 EUR £36.50 OVS £37.50
Non-Member price: UK £38.50 EUR £38.50 OVS £39.50

SEA OFFICER
By Michael Penny
Ref: SO
This book records the life of a working sailor in The Royal Navy & British Merchant Marine in the second half of the 20th Century. The narrative begins in the closing days of World War II when a teenager discovers his lifelong vocation. His subsequent career at sea is filled with people and ships, famous and everyday. A life rich in excitement and love, triumph and disaster, humour and laughter unfolds. Whilst this is a biography of a mariner it encompasses naval architecture, architects and the technical complexities of ships. Mr Penny is a companion of RINA.
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MULTI-HULL SHIPS
By V. Dubrovsky FRINA, A. Lyakhovitsky Ref: MHS
Catamarans, SWATH, and other multi-hull ships are among the dynamically progressing types of marine vessels both in terms of performance and production growth. This progress has been accompanied by a remarkable growth in the number of technical publications. Although these publications, scattered over many sources, decades, and languages, constitute a great database they cannot fulfill the demand for a comprehensive state-of-the-art reference book. This monograph satisfies such demand. For multi-hull ships it is what "Principles of Naval Architecture" (PNA) is for traditional ships.
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By Professor Chengi Kuo FRINA Ref: SMMA
The author introduces this book by asking a seemingly obvious question "What is safety?". To show there is no straightforward answer he illustrates from his experience in conducting a number of safety workshops worldwide. In the foreword to this book Mr E E Mitropoulos Secretary General of the IMO writes: "As Professor Kuo points out early in his book, safety is not an absolute concept and the levels chosen are based on shared values. It is for this reason that this book is so useful because it introduces safety concepts, explains safety terms, and demonstrates how the different techniques can be applied in practice.
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Third Edition By K Van Dokkum Ref: SHKN
Ship Knowledge is all about ships and shipping. Topics range from the structure and systems of various types of modern ships, to engineering, maintenance, safety and the laws and regulations governing the shipping industry. The text is richly illustrated with detailed drawings, photographs and cross-sections of many different types of seagoing vessels, all in full colour, making the book extremely attractive and very infomative for anyone interested in shipping. After reading this book you will no longer think of a ship as an inanimate object, but as a completely self-supporting entity embodying all the modern technologies found in a small town. An indispensable book for anyone interested in modern shipping.
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SHIPS WITH OUTRIGGERS
by V. Dubrovsky FRINA Ref: SHWO
This book is focused specifically on a multi-hull-ship type having one or more small hulls, called outriggers, connected to a much larger main hull of any form. This book is kind of a supplement to MULTI-HULL SHIPS by Dubrovsky & Lyakhovitsky (MHS). Like MHS, the new "Ships with Outriggers" provides detailed technical discussions of arrangements, hydrostatics, propulsion and seakeeping in calm and rough seas, maneuvering, strength, and design of these ships, assuming that the reader is generally familiar with the background or can find it in MHS".
Member price: UK £69.50 EUR £69.50 OVS £69.50
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When purchased with Multi- Hull Ships
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SHIPS AND SCIENCE
The Birth of Naval Architecture in the Scientific Revolution, 1600-1800, By Larrie D. Ferreiro MRINA Ref: SSBNA
The first book to portray the birth of naval architecture as an integral part of the Scientific Revolution, examining its development and application across the major shipbuilding nations of Europe."Naval architecture was born in the mountains of Peru, in the mind of a French astronomer named Pierre Bouguer who never built a ship in his life." So writes Larrie Ferreiro at the beginning of this pioneering work on the science of naval architecture.
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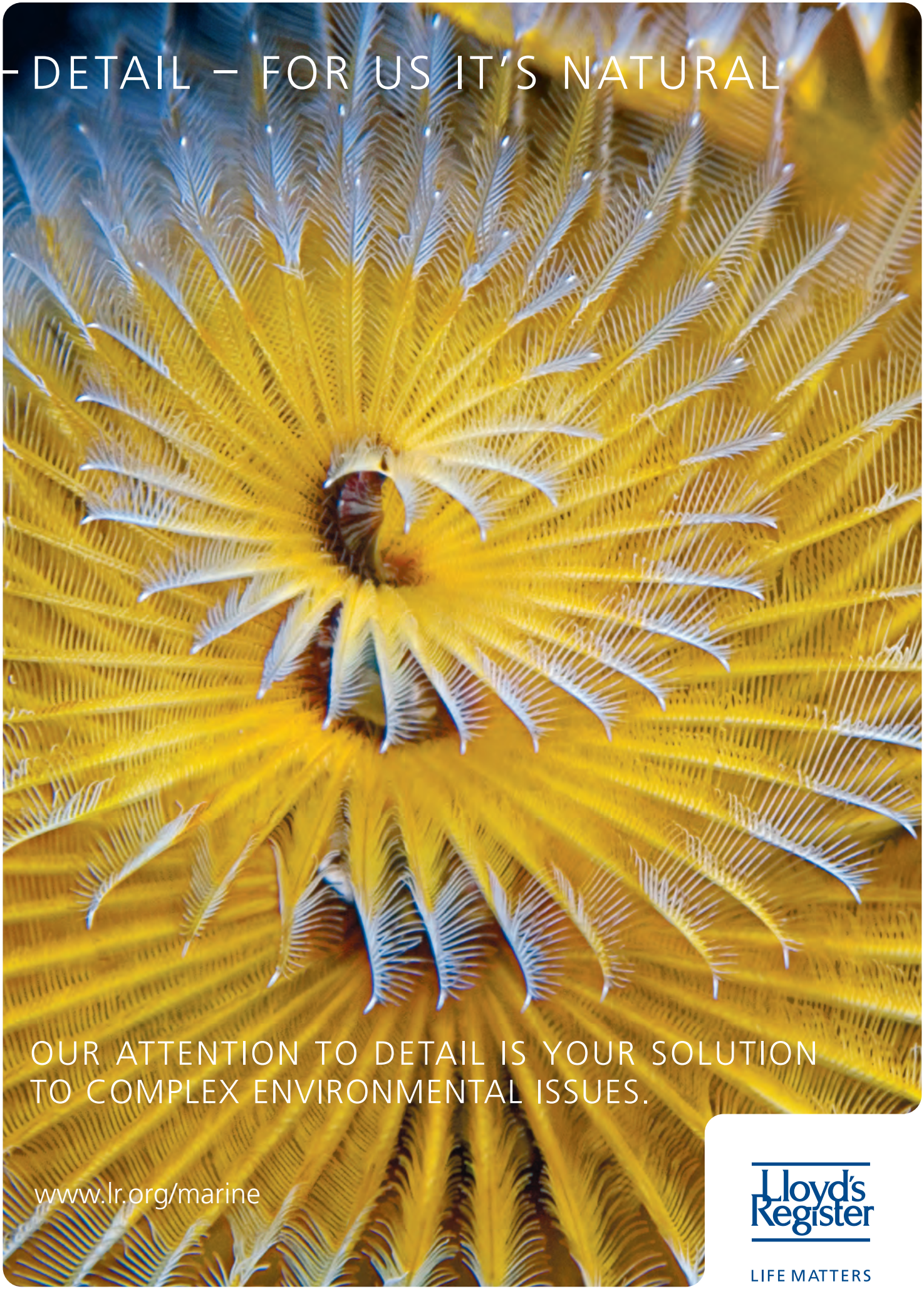

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LIFE MATTERS

Christmas tree worm, Caribbean Sea. The detailed spirals are the ocean worm's highly-developed respiratory structures.

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