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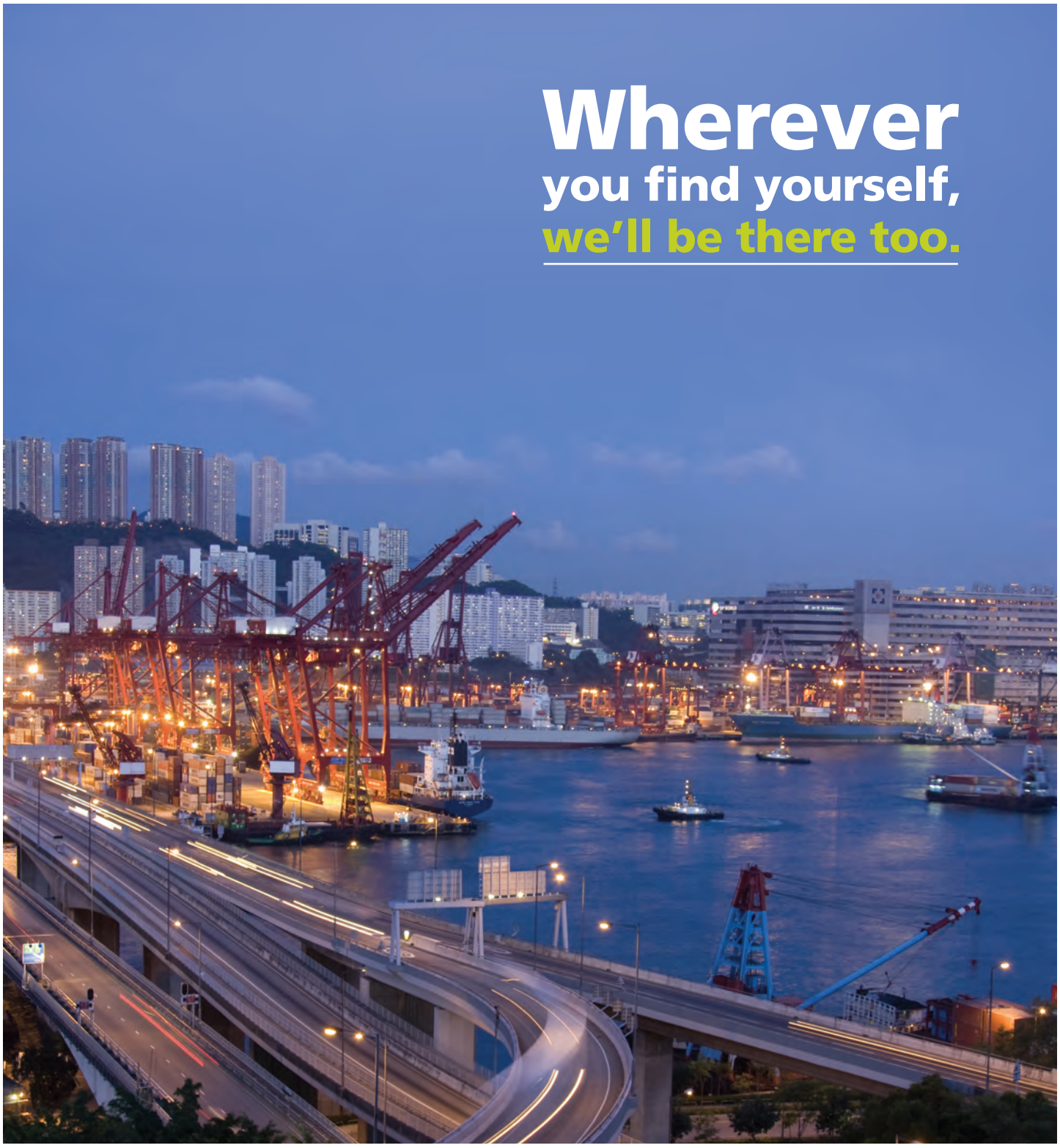

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The Royal Institution of Naval Architects is proud to announce that as of January this year, *The Naval Architect* journal has gone digital. We are very pleased to inform the maritime industry that each issue will be published online, on the RINA website.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

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Where to now guv'nor?

The roller coaster ride through greenhouse gas regulation could get more complicated if the IMO's secretary-general becomes sidelined.

As circuses go Copenhagen's citizens' view of the climate change spectacular was front row, but the expected upbeat finale never materialised and now the mantle has passed to Mexico City at the end of this year for the next instalment of the global extravaganza.

Large sums of money and a worrying amount of climate changing fossil fuel were expended in the pursuit of what turned out to be a show with no headline act. Leaving those in industry, particularly the maritime and air industries, wondering where the negotiations are headed.

In fact the 'Accord' leaves almost all routes still open to the signatories. It was like jumping into a cab and firing off any number of major city destinations to the driver; it would probably not help, confusing the driver into a car crash. It would be like holding a massive international conference and offering any number of vague conclusions as an outcome. Oh wait we already did that.

International Maritime Organization (IMO) secretary-general Efthimios Mitropoulos was diplomacy personified. He expressed his concerns in coded, diplomatic, language. Still he also saw an opportunity for the maritime community to show the world its commitment to fighting climate change. He was effectively saying 'hang on driver I might be on my way to Bonn', where the first round of talks in the lead up to Mexico City will take place between 31 May and 11 June, with a second round of talks taking place in early to mid-November.

Before that, however, Mr Mitropoulos must persuade the Maritime Environmental Protection Committee (MEPC) 60 that it should adopt the IMO's climate change battle plan and that should take place in London in March.

Even before the MEPC meets Mr Mitropoulos' itinerary could be put into further turmoil by the announcement by the end of this month of what, if anything, the signatories to the Copenhagen accord actually signed up to. There is a growing realisation that this was in fact not much, it was a long cab ride that took us all over the climate change landscape, but dropped us off perhaps a metre or two from our starting point.

With that realisation coming to those in power in Europe the chance that the EU will take matters into its own hands is increasing and could yet see Brussels introduce unilateral regulations that will force all ships calling at its ports to meet its more stringent rules.

Such a scenario would seriously undermine the IMO and would require a visit to Brussels to discuss the implications of such a move. One implication could well be that the US maritime authorities follow suit and impose their own regulations too, further undermining the role that the IMO plays in regulating the shipping industry. That would prompt a further ride to Washington for Mr Mitropoulos.

Once all these visits were exhausted the upshot would be that the maritime industry will need to curb its emissions by a significant amount by 2050, probably by around 50%.

That is not so very different to the expectation that would be imposed on the industry by the IMO in a number of stages. How much better then, would it be for the shipping community to accept the IMO proposals, if it is not already too late, and maintain the organisation as the industry's regulator, rather than let the IMO fall foul of the machinations of politicians and see the industry regulated by those who do not know or understand it.

Additionally, regulation of the industry would become fragmented with nation states or economic blocs imposing their own maritime regulations with which shipowners would have to comply.

This process has already effectively begun with the introduction of Emission Control Areas (ECA) from the Baltic Sea to the English Channel that will see ships operating in these zones having to use fuel with a maximum of 1% sulphur from 1 July. Meanwhile, EU regulations allow fuels with a 1.5% sulphur limit while ports outside of EU waters allow a much higher 4.5% limit.

Some ships could cross the boundaries for each regulation in a single voyage, with owners responsible for meeting the different levels in each jurisdiction and subject to fines for failing to meet those requirements.

How much more complicated would it be if the ECA scenario were replicated through say CO_2 controls, NOx rules, damage stability, safety of life at sea regulations and so on.

In theory this would reduce Mr Mitropoulos, or rather the position of secretary-general of the IMO, to nothing more than a cab driver, asking the politicians "where to now guv'nor?" *NA*

Laying up

Idle ships are the devil's playground

A decline in performance as a result of ships being laid up could result in significantly higher costs according to anti-fouling experts Propulsion Dynamics.

Inactive ships will cause an accumulation of fouling, including seaweed and marine molluscs that will affect the amount of fuel that a vessel uses. Propulsion Dynamics VP Daniel Kane said this can amount to a ro-ro using more than four tonnes more fuel a day, costing US$1800/day; an aframax using an extra six tonnes of fuel a day, increasing costs by US$2700/day; and a panamax vessel increasing its fuel consumption by 10tonnes/day increasing fuel costs by US$4500/day.

The graph below shows an example of the dramatic increase in hull and propeller resistance for a ship that was at anchor for only four weeks off the coast of West Africa.

The x-axis represents the time in days (2940 days since delivery). The last set of performance data was received on 'Day 3125' the ship then anchored until we received the next set of performance data on 'Day 3155'.

The resistance of the ship increased 30% which is normal for an older tanker to 52%, which for this ship represented a 0.9knot loss in speed at 85% MCR. The resistance then climbed steadily indicating that the AntiFoulant had been inactivated by the marine growth. These cases are not common because today's hull coating systems are doing a terrific job, but with thousands of ships at anchor now, these cases will be more common, said Propulsion Dynamics.

Cold ironing

Shore power jv will improve air quality

The Swiss-based power technology group ABB and the Italian shipbuilder Fincantieri are to collaborate on the construction, marketing and supply of high-voltage shore connection (HVSC) system that will provide electricity to vessels in port, the so-called cold ironing system.

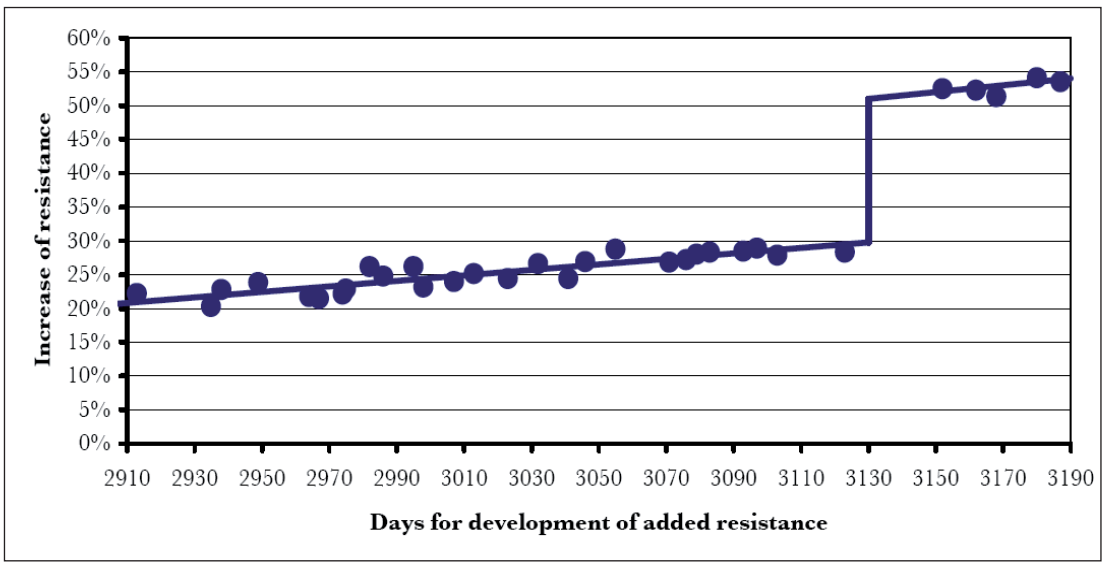
Shore-based electrical supplies are seen as a significant step to improving the air quality around ports as ships will no longer have to run auxiliary engines that operate refrigeration, lighting and cooling and heating systems while the vessel is docked.

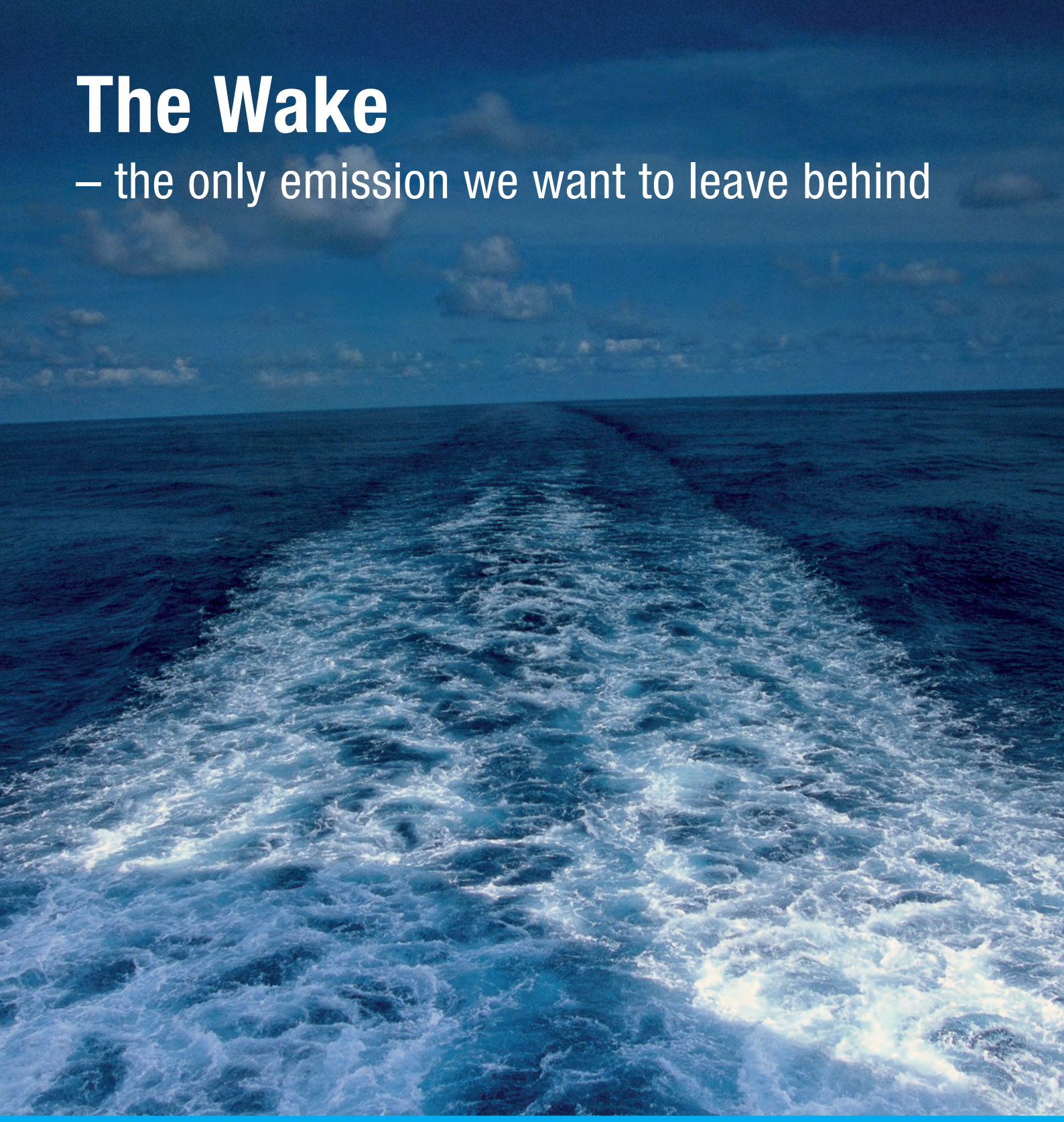
According to the two companies involved a large cruise ship in port for 10 hours can consume up to 20tonnes reducing the CO_2 emissions by some 60tonnes annually, the equivalent output of 25 European cars.

Swedish ports, including Gothenburg, Stockholm, Helsingborg and Pitea, have seen CO_2 emissions cut by 6000tonnes a year as a result of using shore based power connections, according to the Swedish Environmental Research Institute IVL.

"ABB successfully delivered the world's first shore connection to the port of Gothenburg in January 2000," said Veli-Matti Reinikkala, head of ABB's Process Automation division. Giorgio Rizzo, head of Fincantieri's ship repairs and conversions business unit added: "We are pleased to have contributed, together with ABB, to this initiative, setting out to protect the environment, which is also a priority objective for shipowners, our customers.

After four weeks at anchor the ship depicted in this graph showed a significant increase in hull and propeller resistance.





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MAN

The new shore connection systems to be developed by ABB and Fincantieri will meet all current international standards, and can be installed on ships while under construction, docked for maintenance or even out at sea.

Shore connections are now available at ports in the United States, including Los Angeles, Long Beach, San Francisco, San Diego, Seattle and Juneau, in Canada at Vancouver, and, in Europe, at ports in Germany, Sweden, Finland and Holland.

Gas tankers

Gas tanker named

The world's first combined LNG, LPG and ethylene tanker is scheduled to be delivered this month following its naming ceremony which took place at Shenghui Gas & Chemical Systems in Zhangjiagang, Jiangsu Province, China in mid-November.

Norgas Innovation was built to Germanischer Lloyd rules and is owned by Singco Gas Pte Ltd, a joint venture between IM Skaugen Marine Services Pte Ltd and GATX Corporation has an ice class notation E also.

The combined gas carrier was built because the company said there is "rising demand for the transport of clean energy fuels amidst global concern over greenhouse emissions".

The company furth said: "The ship's hull was built by Taizhou Wuzhou Shipbuilding Industry Co., Ltd., in Zhejiang Province. Its cargo system, was built and installed by Shenghui Gas & Chemical Systems Co., Ltd, and is capable of carrying two grades of completely segregated gases simultaneously, cooled and un-cooled, with a unique liquefaction system for LNG. The carrier measures 137m overall in length and 19.8m in width, with a maximum depth of 11.5m, and a capacity of 10,000m^3.

Passenger

Austal trimaran set for sea trials

Following the launch and final fit of its 102m high speed trimaran Austal says the vessel will undergo sea trials during this month with completion set for February 2010.

Despite, Austal's latest protestations that they have a potential buyer for the trimaran based in the North Pole and the ship being technologically advanced the all-aluminium trimaran has so far failed to attract a buyer, though Austal Director – Sales and Australian Operations, Andrew Bellamy, said the vessel had already generated considerable interest in the ferry industry and he anticipated that this will increase now that it has been launched.

The launch of Austals latest trimaran.

"It's not often that a vessel this technologically advanced enters the water. Many operators around the world are excited about what the trimaran can bring to their service – particularly in terms of passenger comfort, payload and fuel efficiency," Mr Bellamy said.

Austal said that its patented trimaran technology means the vessel uses less power than other high speed craft operating at similar speeds, resulting in lower fuel consumption and improved operating economy.

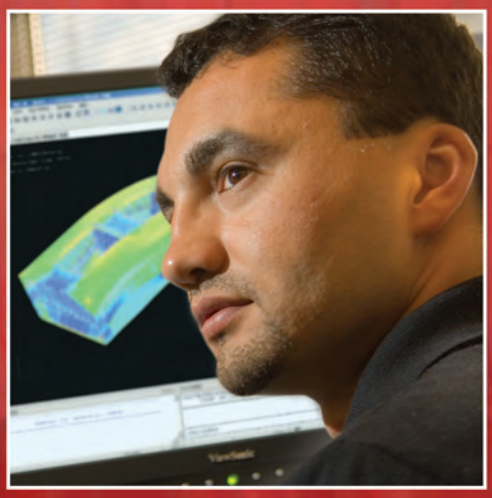
Politics

Yes marine minister

Chemring Marine's managing director Robert Hill has called on the UK Government to appoint a dedicated maritime minister who would "provide a coordinated approach to the industry".

Mr Hill first raised the issue at a House of Commons lunch late last year at which UK MP Chris Mullin and ministers Ian Lucas and Nick Brown were present at the Shipbuilders' and Shiprepairers' Association event.

Robert Hill said: "We believe there is a need for a coordinated UK approach to the maritime industry, similar to the aviation sector, and requested that the Government give consideration to a single Minister for Maritime, covering vessel legislation, equipment regulation and coastal infrastructure."



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Paints and coatings

Ecospec seals six ship green deal

A six-ship deal signed by Singapore's Ecospec Technology and the Dutch operator ForestWaveNavigation will see the former company's new pollution damping technology CSNOx fitted to the latter's newbuilds.

Ecospec claims that CSNOx is "the market's most efficient abatement technology to reduce SO_2, NOX and CO_2 from the exhaust gas emitted by ships".

The company introduced its CSNOx system in 2009 and Ecospec claims it is the first commercially viable solution capable of reducing carbon dioxide, sulphur dioxide and nitrogen oxide emitted by ships all in one process and in a single system.

In addition, the emission abatement is achieved at a net carbon reduction, without acidifying the ocean, and with no other secondary pollutants or harmful substances discharged into the sea.

CSNOx uses Ecospec's ultra-low frequency waves electrolysis treatment technology to treat seawater/freshwater. The treated water becomes highly reactive in removing CO2, SO2, and NOx. The resultant scrubbed water meets and surpasses discharge water international standard and no chemicals are introduced in the CSNOx treatment process.

Shipyards

Sembcorp awards yard contract

Singapore's Sembcorp Marine has awarded the construction contract for phase 1 of its S$750million Tuas View Extension in western Singapore to Zhen Hua (S) Engineering Pte Ltd of China.

The S$453.25million contract with the Chinese company forms a significant part of the phase 1 development which will include the design and construction of four VLCC drydocks, wharves, quays, piers and other ancillary works over a 73.3hectare area with construction scheduled to be completed in 2013.

Bunkers

IBIA warns of ECA conflicts

Passenger ships operating in European waters could be subject to three different regulations governing sulphur in fuels by July this year warns the International Bunker Industry Association.

Following the introduction of Emission Control Areas (ECA) that range from the Baltic Sea, through the North Sea and into the English Channel ships operating in these zones will only be allowed to use fuel with a maximum of 1% sulphur from 1 July.

EU ports, however, will allow fuels with a 1.5% sulphur limit while ports outside of EU waters will allow a much higher 4.5% limit.

Ian Adams, chief executive of IBIA, said: "IBIA understands that, since the rules covering passenger ship emissions are contained in an EU directive, they are not affected by any change in the International Maritime Organisation (IMO) standard for ECAs. The only way in which this apparent anomaly can be addressed is by a revision of EU Directive 1999/32/EC, which covers the sulphur content of liquid fuels derived from petroleum, including those used by seagoing ships.

"Absent any amendment of the EU directive, owners, operators and their bunker suppliers will need to exercise extreme vigilance in ensuring that they do not fall foul of the regulations come July of next year, or simply play safe by opting to use a maximum 1.00 per cent sulphur fuel at all times."

Hatchcovers

Cygnus Hatch detector protector

An ultrasonic testing unit for ensuring that hatch covers do not allow the ingress of water has been launched by the UK based Cygnus Instruments.

Cygnus Hatch Sure is class approved and can be used in place of hose testing said the company. Other benefits are digital calibration controls, open hatch value and sound Level in DB are simultaneously displayed, a powerful transmitter and it is lightweight and easily transportable said the company.

Finance

City investors turn debt collectors

Paul Johnston, formerly of the international Transport Intermediaries Club (ITIC) has, with the backing of a clutch of City investors, established SeaDebt global debt collection agency in the City of London.

Given the current economic crisis hitting global markets and the subsequent difficulties being experienced within the shipping industry Mr Johnston said that the demand for debt collection services had never been higher.

"In a global business such as shipping, securing payment for goods or services can often be difficult,


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especially when the debtor has little in the way of assets or can't be pursued cost-effectively through normal litigation. In today's economic environment, when so many companies are struggling to stay in business, the problems associated with non-payment of debt inevitably increase," said Mr Johnston.

In an illustration of the company's work Mr Johnston explained that: "The case of a tank container operator highlights the problems many people have in securing payment.

"This client hired out a tank container to a freight forwarder that has little in the way of assets. This is of course is quite typical. Many forwarders operate out of rented offices with just a handful of staff yet can be handling substantial sums of money.

"Even if the tank container can be recovered, the associated expenses may be high especially if there is a need for repositioning, cleaning and repair before it can be used again.

"In this particular case, we are optimistic about being able to recover the hire costs and of obtaining a contribution towards expenses," said Mr Johnston.

He went on to say that another case involved an Indian bunker trader, which is owed around US$142,000 for bunkers ordered by a charterer. In such instances, SeaDebt will sometimes seek to arrest vessels if the charterers/owners continue to ignore requests for payment.

The supply of bunkers is a particularly risky business and one that is likely to be a source of much new business, said Mr Johnston.

Paints and coatings

Sher anti fouling - work naturally

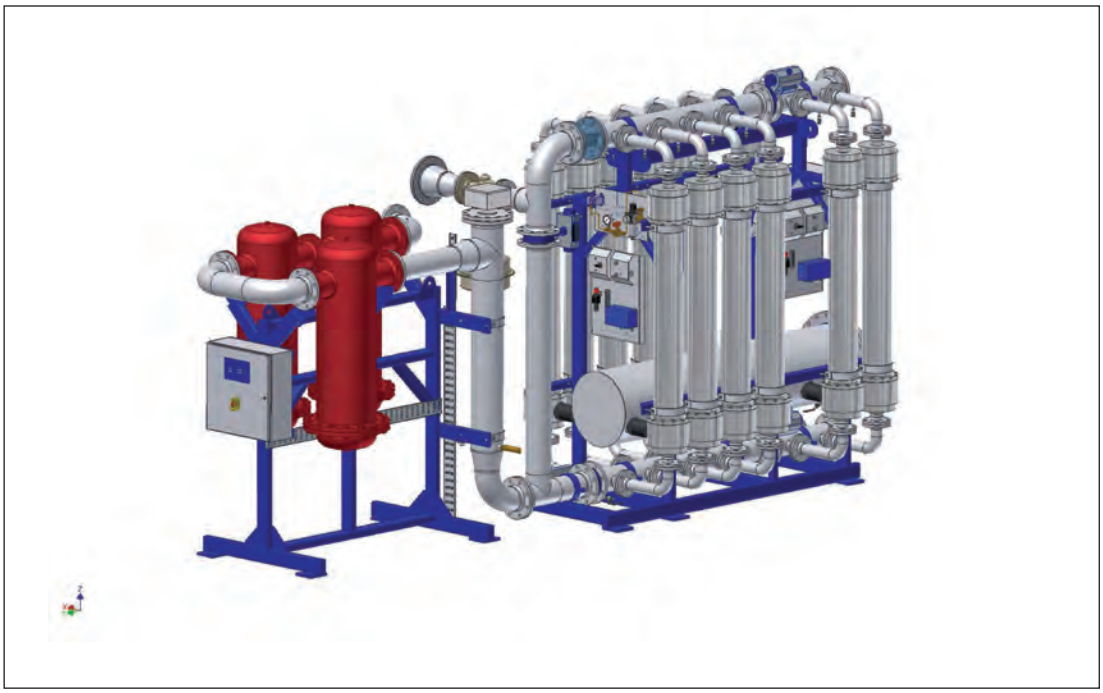
Patented by the US Navy the Sher-Release System can clear marine organisms from a vessel's hull even at low speeds and with low water pressure. The company said that the system offers improved adhesion and abrasion resistance when compared to standard silicon coatings.

"Not only does the Sher-Release System provide superior biofouling protection, work boats, passenger vessels and commercial ships can realize fuel savings as much as six to ten percent," said Brad Rossetto, Vice President, Marketing, Sherwin-Williams Protective & Marine Coatings. "It is a cost-effective alternative that has been tested side by side with other fluoropolymer/silicone to ASTM 5618 Barnacle Adhesion, and delivered the best performance of all systems, up to 50 percent better than competitive systems," said a company statement.

The Sher system is self cleaning and it includes a three layer tie coat formula this includes an epoxy anti-corrosive layer and a protective silicon topcoat interlocked by an elastomeric formula. The technology increases the toughness and adhesion properties of both the epoxy and silicone coatings, creating a system more durable than anything else currently in use.

The company said that the coating is easily applied by trained staff with airless spray equipment and it

The Hamworthy Moss Nitrogen Generator System that will be fitted to UACC's chemical tankers.



contains no heavy metals or biocides and has low levels of Volatile Organic Compounds (VOCs). It, therefore, poses no hazard to marine life.

Power

UACC opt for Hamworthy power

An order of 10 chemical tankers of 45,000dwt each that will be delivered by South Korea's SLS yard between January 2011 and June 2012 will be fitted with Hamworthy's Moss nitrogen generator technology.

The ships, ordered by Dubai shipowner United Arab Chemical Carriers (UACC) have been designed for maximum operational flexibility. The 183m long, 32m wide vessels will feature 22 cargo tanks apiece, of up to 2000m^3 capacity each.

UACC Vice President - Technical, Johan Thuresson said: "It is fair to say that these ships will be our most sophisticated newbuildings to date. We have specified Hamworthy in the past as a supplier of engine room pumps and sewage systems, but this is the first time for us with their Nitrogen Generator System."

Each nitrogen generator will have a capacity of 3.750 Nm^3/h at 95% purity. Nitrogen gas is distributed to cargo oil tanks and slop tanks. The generator will also supply nitrogen to the ballast water tanks for inerting and gas freeing.

Hamworthy said that its latest nitrogen generator is a compact, high efficiency system based on air separation, using hollow fibre membrane modules, which are either cabinet or skid mounted.

Its control system is based on a Programmable Logical Control (PLC) and features a touch screen type control panel. Several mimic flow diagrams are implemented as well as the controls required for safe operation with a minimum of operator supervision.

Newbuilds

Spliethoff takes delivery of MPC

Dutch operator Spliethoff has taken delivery of the final vessel in a series of eight to be delivered by China Changjiang National Shipping. The 17,000dwt multi-purpose carrier *Dynamogracht* was delivered by China Changjiang National Shipping's new facility at Jinling, 300km upstream from Shanghai on the Yangtze River.

Dynamogracht was also built to handle heavy lift cargoes and features the Lloyd's Register ice-class notation 1A FS and is also designed to carry more than 1000 containers while maintaining a cruising speed of 17-18knots. It is the eighth and last vessel of Spliethoff's D-type order at Jinling yard, all built to Lloyd's Register class.

Lloyd's Register, which celebrates its 250 anniversary this year, said: "Industry insight and expertise have proven our most enduring products. Because time-honoured clients such as Spliethoff and Jinling not only count on our experience, they expect us to provide solutions for the technical challenges they will face in the future."

Dynamogracht following its delivery from the Jinling yard in January this year.

Ancillary equipment

Tube bending goes electric

Unison has launched its latest all-electric benders for handling tubing diameters of up to 175mm. Unison's all-electric tube bending machinery range brings the enormous process, flexibility and business advantages of software-controlled set-up and bending to a large range of heavy-duty applications. Machines from the Unison Breeze family can now generate bending torques as high as 165,000Nm.

The ability to accommodate 175mm diameter tubing will make it particularly suitable for handling lightweight high-strength ducting manufactured from specialist materials. Fast, software-controlled set-up enables the Breeze 170 to handle batch sizes as small as one in a very efficient manner.

Unison launches its latest pipe bending machinery.

"All-electric machines have become preferred over hydraulic actuation in tube bending applications involving precision shaping, exotic alloy materials, or small batch sizes," says Unison's CEO Alan Pickering. "Expanding the scope of all-electric machines to seven inch diameters provides the means for new classes of user to improve their production procedures and processes - allowing radical improvements in a large number of areas including machine set-up, the operator skills required, minimum batch sizes, post-bend testing operations, and the need to make sample bends on new material batches to understand the material's characteristics."

In addition to launching larger machines, Unison will be releasing a new generation of its Unibend Control Software. Among many new software features is an intuitive graphical user interface, and a simple bending simulation facility to help users develop collision-free programmes for the most complex part shapes.

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Engines

MAN Diesel supplies Turkey

MAN Diesel has signed a contract with the Turkish manufacturer Karadeniz Powership Company Ltd., worth over €100 million. The Augsburg-based manufacturer of large-bore diesel engines is to supply up to a total of 24 engines, together with electromechanical equipment needed for the generation of electricity.

The contract includes 21 18V51/60DF dual-fuel engines and three type 14V48/60 HFO engines, with a total output of 400MW. The large-bore diesel engines are to be installed onboard four power ships.

The 'power ships' are equipped with their own propulsion engines and therefore do not need to be towed. They are expected to be used in Africa, Pakistan and other regions in the Middle East and around the Mediterranean. The MAN Diesel dual-fuel engines are characterised by the fact that they can be powered by either liquid fuels or gas. "Our dual-fuel engines are ideal for this purpose. The ships will be able to use whatever the infrastructure available at the site on which they are needed – regardless of whether they are fuelled by oil or gas," says Dr. Stephan Mey, head of the power plant business at MAN Diesel. And one further advantage with the dual-fuel engines is that when powered by gas, in particular, they ensure extremely low-emission and therefore ecologically friendly combustion. MAN Diesel has recently received similar orders from Brazil and Australia.

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Ancillary equipment

Cargotec supply electric cranes

Cargotec's has acquired a contract to supply electric-drive MacGregor cranes for a series of eight 16,900dwt bulkers being built in China.

Each crane is delivered as a complete unit tested electrically and mechanically before delivery ready for installation onboard.

The 30tonne SWL MacGregor GLBE cranes are destined for eight 16,900dwt bulk carriers under construction in China for Polish shipowner Polsteam (PZM). They are scheduled for installation from the end of 2010 to 2012.

"The order was secured when PZM, one of the world's biggest dry bulk shipowners and operators, ordered eight bulk carrier vessels from Taizhou Sanfu Ship Engineeering Co., Ltd. in China," says Paul Söderstedt, Cargotec sales manager for bulk ships. "The crane order is a significant breakthrough in the bulk carrier market as it is important recognition of Cargotec's new environmentally-friendly GLBE electric crane, which is based on proven MacGregor designs offering improved overall efficiency and low power consumption."

The electric cranes inherit the familiar characteristics of several generations of MacGregor wire-luffing cranes; all machinery is enclosed within the crane housing, ensuring safe operation and ease of maintenance.

Contact Cargotec Corporation MacGregor, Sörnäisten rantatie 23, PO Box 61, FI-00501 Helsinki, Finland.
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www.macgregor-group.com

Engines

Caterpillar goes electric

Caterpillar has announced its latest step in the evolution of the engine line with the launch of the Cat 3512C and 3516C Diesel Electric Propulsion (DEP) engines, to better meet customer requirements.

Available for a variety of commercial applications and megayachts, the DEP engines are based on the 3500 engine platform while meeting EPA Tier 2 and International Maritime Organisation (IMO) Tier I regulations.

Manufactured at the Lafayette Engine Center in Lafayette, Indiana, USA, the constant-speed DEP engines offer the latest in EUI fuel system capabilities and ADEM A3 Electronic Control Units (ECU). The V-12, 4-stroke 3512C engines are available at 1360kW, 1550kW, and 1700kW, and the V-16, 4-stroke 3516C engines are available at both 2000kW and 2250kW. All engine ratings are certified to the E2 emissions cycle. The electronic "power station" concept will create efficiencies between the control units, unit injectors, instrumentation and displays to perfectly balance power supply, fuel consumption and exhaust emissions at any given load.

The largest benefit of the diesel electric power plant may be the redundancy of the engine power generation because the diesel electric engines are turned on only as they are needed. So if an engine is lost, there is still enough power generated to provide power for shaft lines and vessel electronics.

Additionally, the EUI fuel system capabilities and ADEM ECU will deliver more available power while achieving better fuel efficiency. Further reduction in costs and maintenance, the time between overhaul is increased as DEP engines are not always running at full load there is no physical contact with propeller and engine.

In addition, the emission levels achieved with DEP engines enable shipping companies to obtain special environmental certification with the Marine Classification Societies, such as DNV Clean Design, GL Green Passport, LR Character N or the German Government's Blauer Engel.

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Ancillary equipment

Altro launches new flooring

Altro Transflor has launched Gallium its latest marine safety flooring. Gallium has been specially developed for installation in ships and meets the stringent requirements of the International Maritime Organisation (IMO).

Gallium represents a significant development in marine flooring technology and has been created following extensive testing, research and development by Altro Transflor. Using a new formula consisting of high quality plasticised polyacrylate, the flooring is able to meet the IMO's Fire Test Procedures (FTP) Code. The FTP Code provides strict requirements in terms of flammability, smoke and toxicity, and the new formula enables Gallium to meet all the required criteria.

Gallium has been developed with all the key properties associated with other sheet transit flooring products including slip resistance, durability, flexibility and an integrated bacteriostat. Aluminium oxide granules, dispersed throughout the wear layer, maintain a high degree of slip resistance during the long life of the material. The surface layer contains silicon carbide and coloured quartz to combine both slip resistance and an attractive appearance. The structural support of the flooring is provided by a glass fibre reinforced polyester cellulose scrim.

In addition to these key features, Altro Transflor Gallium is also relatively lightweight, giving improved fuel efficiency and reduced operating costs. Plus, the product is available in a wide range of colours to suit all applications.

"We are delighted to introduce Altro Transflor Gallium," said Stéphane Lévêque, global transit development manager for Altro Transflor. "Safety on board ships is a very emotive issue and we are pleased to be able to provide shipbuilders and operators with a new marine safety flooring product, which meets IMO requirements. The product has passed all the latest standards and legislation, and combines superb fire resistance with other key properties of cleanability, appearance and slip resistance, which are synonymous with Altro Transflor."

Contact Altro Limited, Works Road, Letchworth Garden City, Hertfordshire, SG6 1NW, UK.
Tel +44 1462 707600
Fax +44 1462 707515
E-mail enquiries@altro.com
www.altro.com

Bridge equipment

Mandatory bridge alarms

AMI, UK is launching its Bridge Navigation Watch Alarm System (BNWAS). Following the International Maritime Organization's (IMO) Committee's decision to adopt a proposal that makes the mandatory fitting of this equipment on all vessels of 150gt (keel lay base) or over.

The designers at AMI UK have already developed their new BNWAS with manual interface and motion sensor versions. The alarm system is in accordance with the IMO specification and has been fully tested and put into production, and is now undergoing type approval.

The BNWAS System's alerting procedure is designed to be unobtrusive and easy to use with a smart touch screen system that consists of a main alert panel, a remote alert panel and a watch alert panel for second and third stage alerts. Other outputs from BNWAS include a third stage active watch alarm for the general ship alarm and a fourth stage to activate the Ship Security Alert Distress System (SSAS).

Under the IMO specification two options are offered, either push button or motion sensor activation. With the first option, the system requires the officer on watch to push a button at regular intervals and this automatically triggers an alarm if they fail to do so. The second option using the BNWAS motion sensor, removes the need for the officer to manually press a button to stop the alarm; the sensor detects movement from the watch officer which prevents the alarm from being triggered.

Contact AMI Marine (UK) Ltd, Unit 2 Tower Industrial Estate, Tower Lane, Eastleigh, Southampton, Hampshire, SO50 6NZ, UK.
Tel +44 2380 480450
E-mail service@amimarine.net
www.amimarine.net

Navigation

Seaware Routing version 5 released

Seaware AB has announced the latest upgrade for its Seaware Routing software which includes cost-based ship route optimisation.

The Seaware Routing software is designed to facilitate onboard weather presentation and ship route planning, and is delivered as part of weather

routing solutions from Seaware partners. Seaware Routing version 5 has been developed with special attention to optimisation of short sea passages.

During this work, the code for route optimisation and performance predictions has been further refined, among other things by inclusion of a 'virtual rpm regulator' emulating the real-world engine control system.

"With the new upgrade our software can find the optimum route that will save you fuel and still take you to your destination within minutes from the preferred arrival time", states Anders Olander, executive director of Seaware.

Systematic simulations using the upgraded software have indicated great cost savings potential; in some cases more than 20% in fuel savings. Seaware Routing version 5 features cost-based route optimisation, by including fuel cost, daily cost for ship and crew, and also costs incurred through the failure to meet arrival times. The programme can be used to find the optimum route based on the user's specific needs in different situations.

The Seaware performance model is developed in-house by Seaware naval architects, and describes the ship's speed-power relation both in calm seas but also when the ship is exposed to wind and waves. It takes ship specific data including loading condition as input.

Contact Seaware AB, PO Box 1244, SE-131 28 Nacka Strand, Sweden.
Tel +46 8 601 91 90
Fax +46 8 601 91 91
E-mail info@seaware.se
www.seaware.se

Viking latest liferaft.

Lifesaving

Bright future for liferafts

Viking has announced the launch of the 2010 range of VIKING's popular RescYou liferafts with the introduction of a bright yellow canopy to its 2010 range of RescYou liferafts.

"We challenged conventional industry thinking about liferaft visibility, conducting extensive tests with a variety of colours and nuances to determine exactly which one is easiest to spot in all-weather conditions at sea," says Viking

sales & marketing director, Henrik U. Christensen. "And it turns out that a very particular version of fluorescent yellow makes a clear difference."

Certified according to the High Visibility Norm EN471 for traffic visibility, testing has shown the colour provides excellent contrast to grey and dark blue, the colours of the sea. It also offers the best visibility in bad weather and foggy conditions.

Viking has increased comfort with blue inner linings designed to reduce anxiety and seasickness, and curtained windows that provide a 360degs outlook without having to open the liferaft. Boarding is easier and quicker due to handles positioned above the boarding ramp.

Contact Viking Life-Saving Equipment A/S, Saedding Ringvej 13, 6710 Esbjerg V, Denmark.
Tel +45 76 11 81 00
Fax +45 76 11 81 01
E-mail VIKING@VIKING-life.com
www.viking-life.com

Bridge systems

Raytheon Anschütz wins contract

Raytheon Anschütz was recently awarded a contract to supply their Integrated Bridge System (IBS) to two new bulk carriers. The bulkers will be built at New Times Shipyard in Jingjiang, China. The delivery to the Cyprus based shipping company Intership Navigation Co. Ltd., a member of the German Hartmann Group, is scheduled for August and October 2011.

The new bulkers, each with a capacity of 176,000dwt, will be equipped with full integrated bridge systems. The installation of the bridge systems takes place under the combined supervision of Raytheon Anschütz Shanghai and Raytec Marine Co. Ltd., a subsidiary of Intership and responsible for the technical service of the vessels.

Raytheon Anschütz supplies its NSC radars with the new wide-screens and chart radar functionality. Advanced anti-clutter and collision avoidance functions are included to increase efficiency on the watch. The latest generation of NSC ECDIS features the automatic route planning function, which is designed to reduce the planning even of a demanding route to a handful of clicks. The scope of supply further covers the trackpilots and the manual steering control systems, as well as the complete set of sensors and the radio stations.

Sven Dreyer, Sales Director at Raytheon Anschütz, states: "The awarded contract results from a satisfying relationship to Intership Navigation, who has chosen our bridge systems also for former projects." A special feature onboard of the newbuilds is a complete second bridge, which is intended for use as a training station for officer cadets.

Apart from the reported contract, Raytheon Anschütz has won similar contracts for new tankers, cargo ships and mega yachts during the past weeks. "We all have recognized the global crisis in shipbuilding. But we have come to a comparatively remarkable result in our sales of integrated bridge systems", Sven Dreyer explains.

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Fax +49 431 3019 501
www.raytheon-anschuetz.com

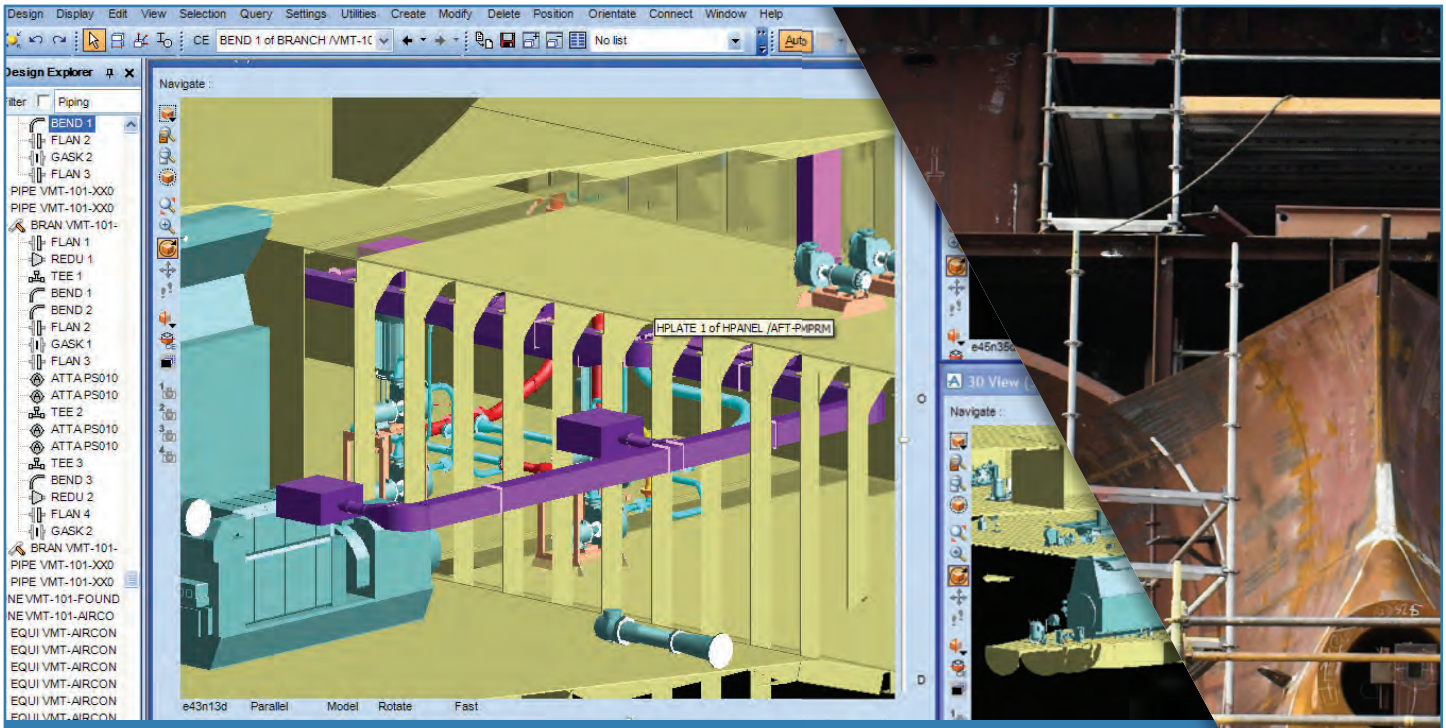
Raytheon Anschütz to supply bridge systems to New Times shipyard.

Engines

Wärtsilä powers Spliethoff vessels

Wärtsilä has been awarded two large orders from the Spliethoff Group, headquartered in Amsterdam, the Netherlands. The orders are for propulsion systems for 11 ships that the Spliethoff Group has ordered at the Ouhua Shipyard in Zhejiang, China. The Wärtsilä scope of delivery includes engines, propellers and efficiency rudders, as well as bow thrusters forming a complete integrated propulsion system for the ships.

The new orders are for five 16,800dwt heavy-lift vessels to be operated by BigLift Shipping, and six 12,500dwt multipurpose vessels. Deliveries of the heavy-lift vessels will take place between August



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and December 2010, and the multipurpose vessels will be delivered between December 2010 and May 2011. With these additional newbuildings the total order book is now about 20 vessels under delivery with Wärtsilä propulsion solutions for the Spliethoff Group.

"These new contracts strengthen the successful and long-standing relationship between Spliethoff and Wärtsilä. More than 60 Spliethoff vessels in operation are equipped with Wärtsilä propulsion systems" says Reinier de Vries, Senior Account Manager, Wärtsilä in the Netherlands.

For the heavy-lift vessels, Wärtsilä's scope will include an 8-cylinder in-line Wärtsilä 46 main engine with an output of 8400kW at 500 rpm, a controllable pitch (CP) propeller, a Wärtsilä Energopac efficiency rudder, and a bow thruster.

"The propulsion technology carried by these vessels has been effectively optimised by designing an efficient rudder/propeller combination, and by employing a six-metre propeller. Wärtsilä used both computational fluid dynamics (CFD) and full-scale tank tests in finalising the design," adds Mr de Vries.

For each multipurpose vessel, Wärtsilä will be delivering a 6-cylinder in-line Wärtsilä 46 main engine with an output of 5430kW at 500rpm, a CP propeller and bow thrusters. The design of the engine and propeller allows the customer to achieve maximum fuel efficiency.

Contact Wärtsilä Corporation, John Stenbergin ranta 2, P.O. Box 196, FI-00531 Helsinki, Finland.
Tel +358 10 709 0000
Fax +358 10 709 5700
www.wartsila.com

Paints & coatings

Jotun to be sole supplier

Jotun Turkey has recently signed their largest new-building contract in 2009 so far. Jotun will supply paint for 10 newbuilding vessels, which will be delivered to Palmali Shipping Group.

Palmali Shipping Group has signed a contract for 10 x 7000dwt newbuild chemical tankers with Besiktas Shipyard. Jotun Turkey won the paint contract and is sole supplier for the project.

"Since the newbuilding market is dramatically decreasing due to the global financial crisis, we are satisfied that we have secured the biggest active project in Turkey", commented managing director, Sukru Ergun, Jotun Coatings in Turkey.

Besiktas Shipyard has already delivered and out-fitted eight 3300-3900dwt tankers, all protected with Jotun Coatings. All vessels in the new contract will be coated with Jotun's new tank coating product: Tankguard Special Ultra.

"This project will be a great reference for Tankguard Special Ultra", says Mr Ergun.

The 10 tankers are the third generation 'Armada' tankers with the RST22M design. The vessels will be delivered between December 2010 and September 2013.

Contact Jotun A/S, P.O.Box 2021, N-3248 Sandefjord, Norway.
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E-mail info@jotun.com

Wärtsilä will deliver the propulsion systems for eleven new Spliethoff Group vessels to be built at the Ouhua Shipyard in China. The picture is of the D4-type 16,800dwt Heavy-Lift vessels to be operated by BigLift Shipping.

The World Superyacht Awards

Young Designer of the Year 2010

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

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

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

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

The Competition

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

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

The Award

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

The sponsor

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

The closing date for entries is 31 Jan 2010. If you are interested in submitting an entry or would like more information, contact Giuseppe Gigantesco, E-mail: ggigantesco@rina.org.uk, 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

COP 15; failure or opportunity?

Failure of the political leadership to achieve a global formula for reducing greenhouse gases (GHGs) has left the International Maritime Organization (IMO) with more time to secure a deal on its proposals for shipping at the March 2010 Marine Environment Protection Committee (MEPC).

A clean up operation of sorts has begun in Copenhagen, the Bella Centre and its environs will be readied for the next event, the clean up of the globe looks like it may take a while longer to achieve.

Efthimios Mitropoulos, the IMO secretary-general said there was "concern" that a legally binding agreement had failed to materialise from Copenhagen, mixed with "measured satisfaction" that the Accord that was eventually thrashed out could eventually lead to a legally binding agreement.

Mr Mitropoulos also spoke of his "hope" that post-Copenhagen consultations could also lead to some consensus on action that will be "on action needed to be taken to save the planet will be reached at the next Conference – possibly in Mexico one year from now".

According to Mr Mitropoulos despite the failure of COP15 to reach an agreement and the disappointment that was created in communities around the world, the maritime community can now seize the opportunity afforded by the Copenhagen failure to show the world that it is committed to reducing its GHG emissions by supporting the IMO's 2005 Action Plan.

He said: "To that end, we have already made good progress through a partnership of our Member States, the shipping industry and civil society interests."

The three pronged Action Plan aims to reduce GHG emissions by requiring new ships to meet a complex formula known as the Energy Efficiency Design Index (EEDI). New and existing ships will be required to submit a Ship Energy Efficiency Management Plan (SEEMP) for the efficient operation of ships and a Ship Energy Efficiency Operational Indicator SEEOI) another formula that will measure the fuel efficiency of a ship.

A market based instrument that will include a fund collected either through a cap and trade system for carbon or taxes levied on the cost of bunker fuel will also be discussed at MEPC 60 in March, though a hybrid of the two systems could eventually be agreed. A final sticking point on who will collect the funds and who will decide how they will be used could be the biggest task that MEPC will face in March.

> "international shipping requires global regulations if it is to function as the principal vehicle for the movement of global trade"

Nevertheless, Mr Mitropoulos argued in Copenhagen that the IMO had developed the skills for meeting these objectives over a period of 50 years. "The IMO's Marine Environment Protection Committee has been developing measures to limit or reduce greenhouse gas emissions from international shipping and has agreed that any related regulatory scheme should be developed and enacted by the Organization as the most competent relevant international body," he told the Copenhagen conference on 11 December.

Alluding to the Common But Differentiated Responsibilities, where developed countries taken on a greater element of the financial burden, Mr Mitropoulos stressed: "That international shipping requires global regulations if it is to function as the principal vehicle for the movement of global trade."

He went on to say that shipping "regulation should, without exception, be the responsibility of an international body dealing exclusively with maritime matters, one that understands how the industry operates and has the specialised knowledge, skills, track record, experience and expertise."

Those words may yet fall on deaf ears, however, because with no targets for emissions reductions for shipping; no direction on whether a tax or an emissions trading scheme should form the basis of market-based emissions control; no clarity on whether the United Nations Framework Council on Climate Change would leave responsibility for implementing any emissions agreement that might emerge in the future to the IMO; and no resolution for reconciling the Kyoto Protocol principle of differentiating climate responsibilities according to parties' economic capacity with the IMO's primary principle that all ships and nations should be treated the same, there can be no guarantees that the IMO will remain the responsible body for regulating shipping emissions.

In fact some reports suggest that the possibility that some form of unilateral action will be taken by Europe and the USA is now more likely. Reports from the EU suggest that it could make a move to regulate emissions in shipping if no global agreement emerges. The EU proposes to impose targets for shipping to cut its emissions 20% below 2005 levels by 2020.

Both the USA and EU are developing legislation to impose either a cap and trade scheme for carbon emissions within the EU or the USA Senate appears to favour a levy on bunker fuel. If this legislation is passed into law then the authority of the IMO may yet be severely dented. *NA*

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The following charges will be made in the event of a cancellation: £100 if received by 15th March 2010 and £300 after that date but before 7th April 2010. Cancellations made anytime after that date will not be refunded.

Registration fee: RINA Members: £1080+VAT (Total £1269) Non Members: £1200+VAT (£1410) Group Fee (3 delegates or more): £1060+VAT (£1245.50)

Breaking up is hard to do

Designing commercial vessels is no longer simply about how they will work. Naval architects now need to consider how the vessel will end its life also by supplying details of hazardous materials used in the vessel's construction. Sandra Tsui looks at how China is approaching the new rules.

Chinese ship recyclers deem the cooperation between shipbuilders, operators and ship breaking yards a prerequisite to achieve the goal of the Hong Kong Convention on Ship Recycling - to ensure ship breaking does not pose an unnecessary risk to human health and the environment.

"We are not demolishing something that comes from nowhere, the shipyards built them, and hence we have to break them when they are dumped. It is important to know what they have used to build those ships and it would make the whole thing easier," said Xie Dehua, Executive Director and Secretary-General of the China National Ship recycling Association.

The Hong Kong Convention (full name: Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships) was signed in May 2009 and was available for ratification from September last year. However, Mr Xie stressed the convention does not only contain guidelines to ship recyclers, but also covers the design, construction, operation and repair of vessels.

Under the convention, ships will be required to have an initial survey to verify the inventory of hazardous materials, additional surveys during the life of the ship, and a final survey prior to recycling. Vessels sent for recycling must carry an inventory of hazardous materials. Ship recycling yards have to provide a "Ship Recycling Plan", to specify the manner in which each ship will be recycled, depending on its particulars and its inventory. Parties to the convention will be required to ensure that ship recycling facilities under their jurisdiction comply with the convention.

"These arrangements will certainly enhance the communications between shipbuilders and ship recyclers," said Mr Xie, adding that the Hong Kong Convention posed both challenges and opportunities to ship breaking yards in China. But, he expects the convention will be advantageous to the Chinese recyclers.

In the past two decades, Chinese ship breakers have strived to re-position themselves as green ship recyclers through the promotion of replacing beaching with dry dock or pier dismantling; as well as the increasing usage of machinery instead of a human workforce. A "Green Ship Recycling General Regulation" was issued by the Chinese government in 2005 listing 12 criteria for ship breaking yards to follow (see panel on page x??).

Ship breaking at the Jianmen Yinhu Shipbreaking Company in Southern China.

Changjiang Ship-Recycling Yard, one of the largest ship breaking facilities in China, located at the New Port Area of Jiangyin City, Jiangsu Province, has already fulfilled all requirements of the Hong Kong Convention, according to Mr Xie.

Mr Xie anticipated that it will not take too long a period of time for China to ratify the Hong Kong Convention as the nation has taken the issue seriously. A high level meeting was held in July 2009 where senior officials from various ministries and representatives from the International Maritime Organization discussed the necessary preparations before the country could ratify the treaty.

The decision making process of when to ratify will be nothing short of complex, explained Mr Xie, as it involves many departments of the government, such as the Ministry of Environmental Protection and the State Oceanic Administration that take care of pollutions in land and the near sea; the Ministry of Commerce and the Ministry of Agriculture that oversee the registration of merchant ships and fishing vessels as well as the Ministry of Transport and the Maritime Safety Administration.

One of the major hurdles, said Mr Xie, would be to set up an effective regulatory model and procedures to carry out the convention requirements. Issues such as which institute or department should take charge of the whole event and how those checking and approval procedures can be soundly carried out at the factory level will have to be sorted out before ratification.

The country's administrators have proposed a pilot project to the IMO to be carried out in selected ship breaking facilities across the nation where the efficacy and efficiency of such procedures would be tested. Up to three ship breaking yards will be singled out based on how representative they are on geographical and technical grounds. The administrators intend to involve both plants that adopt

Extracts from China's Green Ship Recycling General Regulation.

1 Principle requirements (Section 4.1)
- Encourage dismantling alongside wharf and in boatyard; eliminate dismantling vessel on beach
- Import of vessels to comply with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

2 Basic requirements on environment management (Section 4.2)
- Ship recyclers are to receive information including major function of the ships, if the ship contains radioactive materials and a manifest of the quantity and location of solid waste and dangerous materials on board the vessels.
- Separate operation districts for different procedures: a basic area for dismantling where the whole ship is broken into large sections; and a second area for dismantling those large sections, separate storage area and waste processing area etc.
- Records of vessel information, breaking procedures, wastes, environmental monitoring investigations to be kept for at least three years.
- Annual environment monitoring investigations to be carried out under supervision of the government.

3 Water pollution requirements (Section 4.3)
- Specify geographical districts where no ship dismantling facilities are to be built
- Companies are to process liquid wastes, e.g. oil, polluted water or mud etc., until it is up to the standard required before disposal; to install oil boom when dismantling in water; and to install facilities to prevent rain water to wash pollutants away from the yard etc.

4 Air pollution requirements (Section 4.4)
- Ship recyclers should try to prevent explosion; use cryo cut when dismantling oil containers; moisturised asbestos parts before dismantling and prevent dropping asbestos parts from high altitude to the ground etc.

5 Solid waste processing requirements (Section 4.5)
- Specify special procedures for handling batteries, asbestos, electric wires, inflammable materials, polluted soil etc.

6 Sound pollution requirements (Section 4.6)

7 Safe operation requirements (Section 5)
- Specify regular check-up items and the safety procedures shipbreaking yards should adopt in different circumstances, such as during naked-fire operation or typhoon.

8 Staff health – principle requirements (Section 6.1)
- Specify the basic protection equipment for the crew
- Annual physical examination for every crew members

9 Staff health requirements – for asbestos processing crew (Section 6.2)
- Special training, annual lung X-ray, separated shower facilities and protection equipment, e.g. mask, are to be provided for asbestos processing staff

10 Staff health requirements – for cutting crew (Section 6.3)
- Specify protection equipment, e.g. goggles
- Annual blood and urine lead test provided for cutting crew. Those with blood lead level over 60ug/ml or urine lead level over 100ug/ml are to be transferred to other operation units.

11 Staff health requirements – a contingency plan is required (Section 6.4)

12 General management requirements (Section 7)
- Computerisation etc.

drydock and pier side breaking in the pilot scheme.

Nie Hu Hui, manager of the international ship breaking department of Jiangmen Yinhu Ship breaking Co Ltd, a major ship recycling yard in southern China serving mainly foreign shipowners, said the yard will have to alter its current ship dismantling sequence to comply with the convention. Higher investment on staff training and equipment advancement are also required.

"But at the same time compliance to the convention will raise the international recognition of our yard and help us to be more competitive," he added.

Both Mr Xie and Mr Nie agreed that refrigerated cargo vessels and fish processing vessels are the most difficult to handle as they often contain more insulating materials which can be dangerous and cement which is often unrecyclable. It takes up more man hours and requires more equipment to dismantle those ships.

Mr Nie also mentioned that the most urgently needed technical breakthrough for Jiangmen Yinhu is a more efficient way to deal with the accumulation of gas in oil tankers. "What we are doing now is to ventilate the vessel and use an explosimeter to test if it would be dangerous to operate with naked fire. But, this is time consuming and difficult to guarantee a safe result."

At the moment, overseas shipowners are the major clients for Chinese ship breakers, according to Mr Xie, but domestic business has picked up in recent years, as more than 35% of the China-flagged vessels are more than 25 years old. *NA*

Meeting the hydrodynamicist's needs

Successful hydrodynamic analysis depends on using the proper tool for the problem to be solved. Making design tools work for you is only possible, say HydroComp, Inc if you understand the limitations of the available tools.

Hydrodynamics is a very broad discipline that includes speed and power prediction, hull form analysis, propulsor design, and other tasks. The tools that we employ to solve hydrodynamic problems range from simple plots and spreadsheets to very complex computational codes and model testing.

	Simple	Functional	Complex
Empirical	Comparative relationships (plots)	Statistical analysis (regression)	Model testing
Computational	Quick estimate formula	Relational elements	Computational Fluid Dynamics (CFD)
Data required	Minimal parametric → → → → → Full three-dimensional		
Required knowledge	No special training → → → → → Specialised training		
Expense	Minimal → → → → → Costly		

Table 1 Summary of hydrodynamic analysis solutions.

	Statistical methods	Relational elements	CFD
Hull form	Parametric (e.g., L/B, B/T, CP)	Long'l distribution (e.g., sectional area)	3D surface
Propeller	Parametric (e.g., P/D, EAR, Z)	Radial distribution (e.g., pitch, chord)	3D surface

Table 2 Scope of data definition for different solutions.

Empirical or Computational

It is useful to distinguish between 'quantitative' problems encountered in naval architectural design, such as the prediction of hull drag or propeller thrust, and those problems that are 'qualitative', visualisation of flow, comparisons between design variants for example. Identifying the nature of the problem is key to the successful application of the proper solution.

The 'gold standard' of hydrodynamic analysis is model testing, but this can be costly to employ as an integral part of the design cycle for most projects. For questions of a quantitative bent, empirically based analysis solutions (such as statistical methods, systematic series and sea trial evaluation) are still the real workhorses of day-to-day hydrodynamic analysis. Most designers simply want to reliably predict vessel drag or determine propeller performance, for example, than to tweak the hull form or visualise a flow problem.

Where empirical solutions directly serve quantitative problems, computational solutions are most suitable for qualitative problems of visualisation and comparison. The numerical nature of a computational solution is self-regulating (to a point), so that small changes in geometry can effect a corresponding change in analysis results.

Model tests can also provide qualitative solutions, but generally at much higher cost and effort, likewise the careful use of empirically based analyses can effectively provide qualitative results, but not to the same localised degree as a computational code.

What about CFD?

There has been an upswing in the broad commercial interest in computational fluid dynamics (CFD). For problems of visualisation and local details, CFD has become a viable option. For many problems, it is the ideal solution, but it is not without its caveats and must be employed carefully.

A reliable application of CFD still requires deep pockets and specialised training. One issue of concern is simply a problem of expectation. Many proponents of CFD propose that it is the solution for all things hydrodynamic, which results in unrealistic expectations for the use of the tool. CFD is indeed very powerful and capable – so long as the problem is well defined and of a qualitative nature.

To illustrate just what is needed for a reliable application of CFD HydroComp, Inc. was recently contracted to participate in an investigation of a noise and vibration problem on a sizeable passenger vessel. In our development of knowledge about the inflow to the propeller, we collaborated with a colleague that has over 20 years of hydrodynamic experience, including extensive familiarity with CFD. We achieved the expected results, but even with his specialised expertise, the modelling was difficult and calculations were repeated. Only through his knowledge of the codes was he able to deduce that the initial results were inaccurate and required a different modelling scheme.

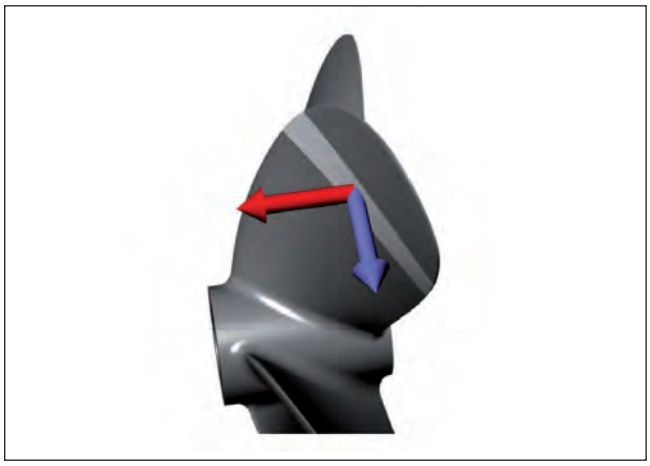


Figure 1 Relational element radial slice.

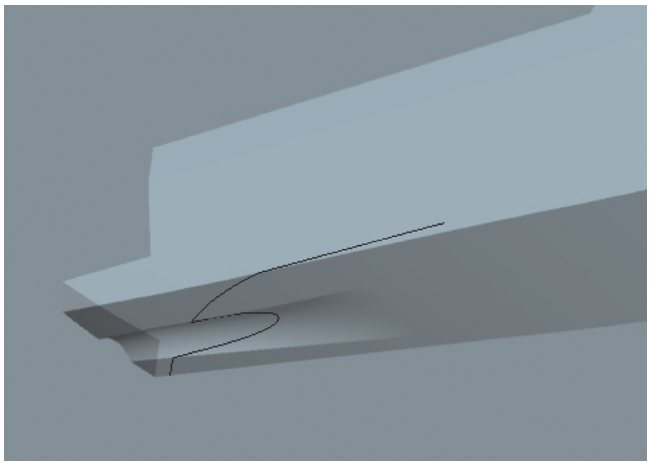


Figure 3 Irregular waterline offsets through a propeller pocket.

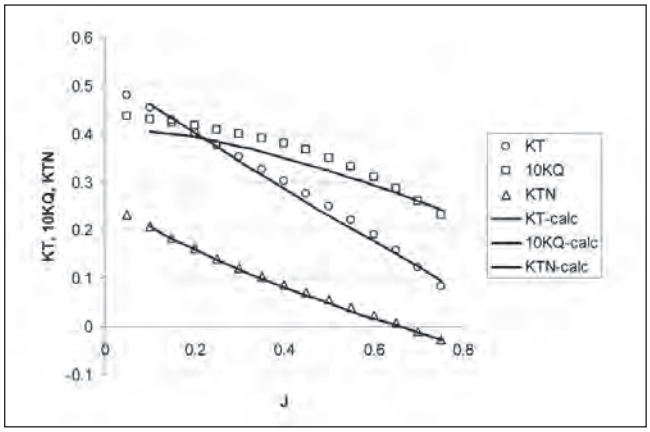


Figure 2 Propeller performance, Kaplan 4.55 in 19A nozzle.

HydroComp's opinion about CFD is that it is downright amazing for what it does – but it does not do all things.

The International Towing Tank Conference states it well: "Computational capabilities are making inroads in the design and evaluation processes for many vehicles of interest including marine vehicles." … "It is inevitable that these methods will have an even larger role in the future as computer power increases and the application of such codes further matures. However, it will still take considerable effort to have the confidence in these methods that currently exists with the model tests as grid resolution and turbulence modelling drives the accuracy of the solution."

Hybrid empirical – computational solutions

Consider the three categories of analytical solution offered in the table below. Statistical methods are convenient, cost-effective and accessible to virtually any naval architect, but the scope of their solution is limited, more-or-less, to parametric data.

Highly complex codes like CFD, on the other hand, offer the ability to fully define the three-dimensional surface of the propeller or hull. Such codes, however, are costly both in terms of computation time and resources. It is not uncommon for computation time to exceed 20 minutes for a single generation, with hundreds of generations required for a complete analysis. [Brizzolara 2009]

"Relational elements" are a term for the category of calculation that straddles the ground between the solely parametric and fully three-dimensional. These solutions allow for practical global variations that are not available in statistical methods, but without the complexity, cost, or specialised training required for CFD. Attributes of such calculations would include:

- Description of hull and propeller distributions using "elements".
- Predictions are well behaved with no unusual results.
- Any set of data can be applied. No special knowledge of element modelling is required.
- Fast calculation times.

The relative simplicity of relational element calculations also allow for empirical connections that improve accuracy of results. Two examples of empirically enhanced relational element calculations are presented below.

Example – Propeller design and analysis

A hybrid Propeller Design and Analysis tool from HydroComp utilises a fundamental vortex lattice lifting-line code for moderately loaded propellers, with a connection to empirical data. The lifting line code is the numerical underpinning of the tool, providing for analysis of radial variations of shape, such as chord, thickness, camber, and pitch. (This is illustrated in the graphic below.) It also includes definition of axial and tangential wake velocities.

Most lifting-line codes use a generic value for drag coefficient, whereby this new code allows empirical improvements as the user can select from a list of foil types (such as NACA 66 mod, Segmental, and Bi-Circular). The characteristics of the foil, such as its

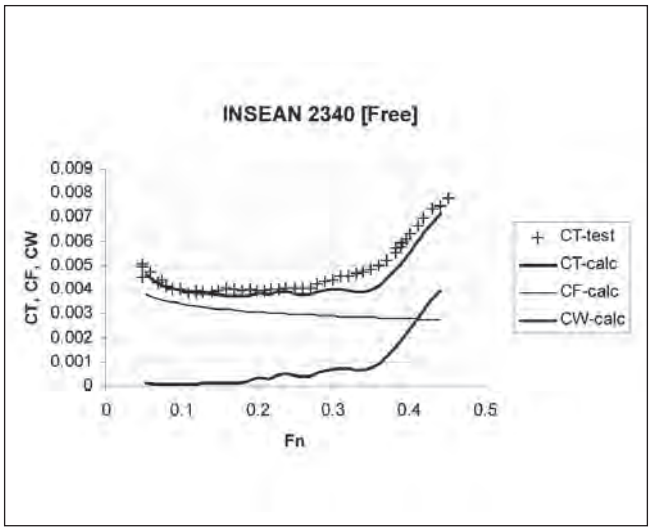


Figure 4 Prediction of INSEAN 2340 model (DTMB 5415 variant); automated correlation.

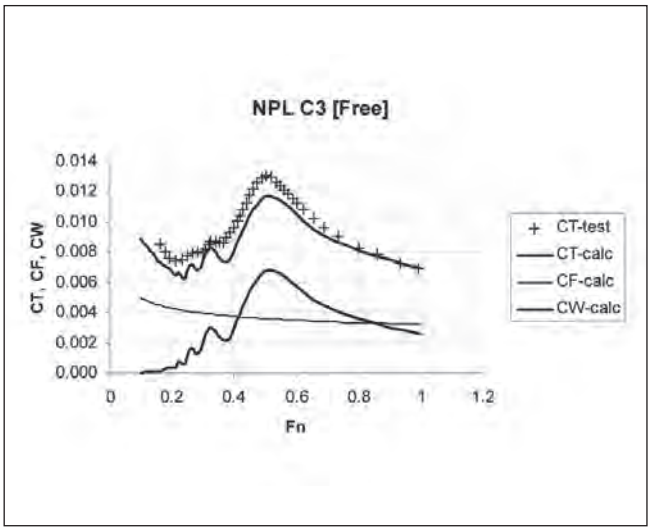


Figure 5 Prediction of NPL C3 model; automated correlation.

scale-corrected lift-drag coefficients, are then applied to more accurately predict quantitative performance.

The software can be applied for full wake-adapted design of optimal characteristics or off-design analysis of performance and KT-KQ curves. A variety of design choices are available, including different optimal circulation methodologies and tip or root unloading.

The empirical correlation functions also extend to ducted propeller performance. Development of this tool included data analysis and fitting of nozzle-propeller thrust ratios, and prediction of the nozzle's influence on induced velocity. A validation plot is shown below for the Kaplan 4.55 propeller in the 19A nozzle, with excellent results (even near bollard).

Example – Bare-hull drag

Calculation of bare-hull resistance can also be accomplished in a similar manner by slicing the hull onto longitudinal elements of sectional area and beam. This provides greater definition of the geometry than you have with a purely statistical series (that might use only the prismatic coefficient, for example, to define the sectional area curve). While you do not have full three-dimensional definition of the hull surface that you get with complex codes, you will have a practical and meaningful distribution of the hull's shape.

For example, a hybrid Bare-Hull Drag module for HydroComp's NavCad software is built upon a novel implementation of thin-ship theory that avoids the use of hull offsets (as would be needed for a Michell Integral calculation, for example). In place of offset definition, a simplified approach was adopted that used only longitudinal sectional properties. This insures more well-behaved and reliable code, and protects the user from significant inaccuracies that occur with irregular changes in surface offsets for things like tunnel thrusters or propeller pockets (as shown in Figure 3).

Of course, wave-making drag is important only in so far as it leads to correct prediction of total bare-hull drag. Extensive effort has been put into reliable prediction of frictional drag and form factor, and also into empirical correlation functions for the contributions of immersed transom stern, sinkage and trim, pressure drag, and viscous effects. These correlation functions are automated in the code, and it is important to point out that no special modelling decisions were made in the creation of the following validation plots (Figures 4 and 5).

Summary

As stated at the outset, the proper tool for hydrodynamic design and analysis depends on the nature of the problem to be solved. Empirically based statistical methods are very cost-effective and accessible to any practicing naval architect. They are strong solutions for quantitative problems, but offer little in the way of localised qualitative analysis. On the other hand, complex three-dimensional codes, such as CFD, are uniquely qualified for analyses requiring visualisation of flow and comparative optimisation. Unfortunately, they are expensive to acquire and maintain, and required an advanced level of training and experience to insure that they produce reliable results. New hybrid tools, based on well-established "relational element" techniques, are emerging that bridge the gap between the empirical and computational. These tools are available to any naval architect, and should be considered when both quantitative and qualitative answers for distributed geometries are needed. *NA*

References

ITTC Resistance Committee, Final Report and Recommendations to the 25th ITTC, International Towing Tank Conference, Proceedings Vol. I, 2008.

Brizzolara, S., Gaggero, S., and Grasso, A., Parametric Optimisation of Open and Ducted Propellers, SNAME Propellers/Shafting Symposium, 2009.

Donald MacPherson,
VP Technical Director,
HydroComp, Inc.

Dynamic positioning makes Nordic's AFDV's a safe bet

Nordic Maritime is aiming at the premium accommodation and offshore construction market with its new DP2 designs. Mike King spoke to Nordic.

The first of four new Accommodation Field Development Vessels (AFDV) designed by Singapore-based Nordic Maritime for offshore support assignments will enter service next year.

Each of the vessels is 100.58 m in length, 31.70 m in breadth and has a design draft of 4.50m. But the basic specification fails to capture the scope of ambition on show in the Nordic AFDV model.

The vessels were designed in-house with Nordic overseeing construction of the vessels at NGV Tech's yard in Banting, Malaysia. The design concept was developed after Nordic's managers identified a shortage of premium quality offshore accommodation suitable for deployment at the increasing number of offshore energy sites which lack anchorages.

The key design innovation on the ABS-classed AFDV series is the fitting of a Kongsberg Dynamic Positioning (DP2) propulsion system which guarantees the safe operation of the vessel by location and heading limits without the use of tug support or anchors. This works by using the vessel's own propulsion system and thrusters - six four-stroke generator engines of 1200kw and six retractable azimuth thrusters of 1000kW.

Nordic Maritime CEO Morten Inhaug.

"The DP2 system offers a lot of options offshore," said chief operating officer, Kjell Gauksheim. "It makes its potential operational deployment highly flexible. While we can put the vessels to a variety of uses such as offshore heavy lifts, platform installation/de-installation, ROV support, diving support, storage and salvage, with the DP2 system they are ideal for deployment in deep water for any offshore projects which require many men and cranage."

The DP2 system uses sensors to measure forces such as wind, current and waves which are impacting the vessel affecting speed, heading and position. Using position-reference systems, gyrocompass and vertical reference sensors, a position control system then calculates the thrusters and propulsion force needed to control the vessel's motion and correct roll and pitch.

Each of the six retractable azimuth thrusters is motor-controlled remotely from the bridge using mounted variable speed joysticks or wing stations.

The DP2 system enables the vessel to remain in station for an extended period while, for example, the crane is in operation offshore or workers are being transferred onto a platform. It is also fully integrated with operation of the telescopic gangway and all equipment is fitted with dual redundancy so that no single fault in an active system will cause a failure.

The retractable telescopic gangway was designed to ensure maximum safety and operational flexibility. Weighing in at some 32tonnes and supported by a 37tonnes steel control tower, it is able to retract and rotate 360deg, lift upwards 24% and has a maximum luffing angle of 16.5deg. It can be operated both in horizontal position as well as when it is lifted or lowered. The bridge is also fitted with hydraulic shock absorbers at each end to ensure smooth operation.

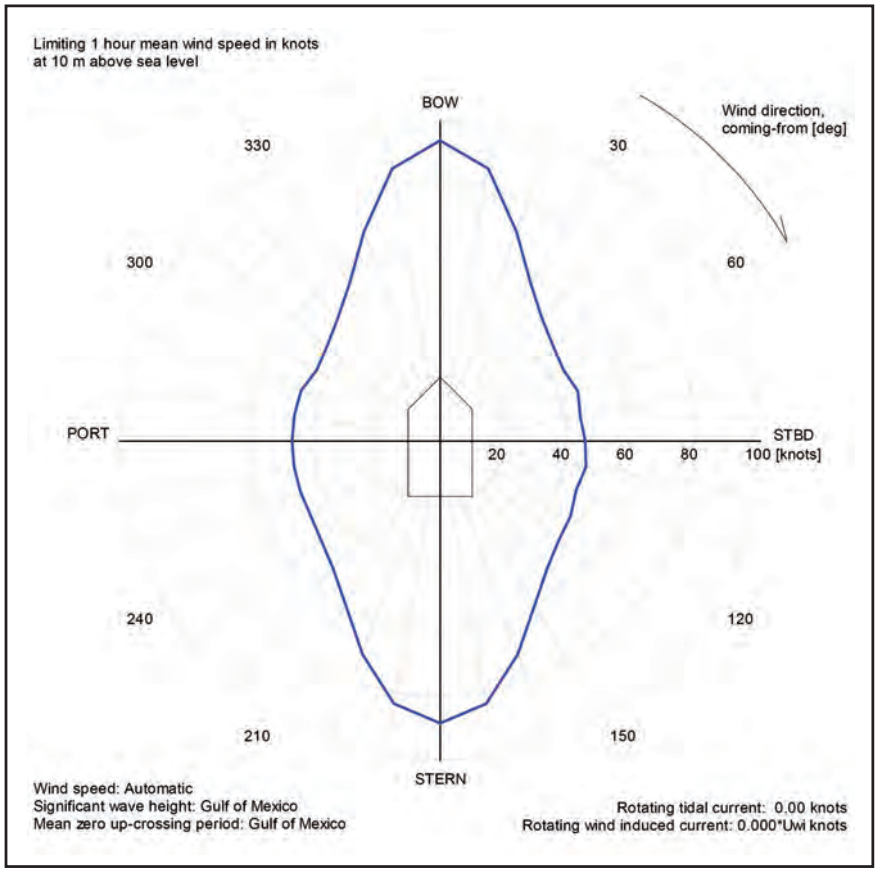
The gangway is 30.5-42.5m in length and has its own sensors which are fully calibrated with the vessel's DP2 system. If the system detects any danger in the operation of the gangway, alarms related to the movement of the bridge and operation and equipment failure are activated and the gangway is retracted automatically. When the gangway

TECHNICAL PARTICULARS

Nordic Constructor

Length:	100.58m
Breadth:	31.70m
Depth (Moulded):	8.50m
Draft (Design):	4.50m
Main Deck Load:	12.5Tonnes/m^2
Clear Deck Area :	1250m^2
Deck Heights:	3m
Complement:	400men
Speed:	10knots
Additional info	
Vessel Type:	DP2 Accommodation Field Development Vessel
Builder:	NGV Tech Sdn. Bhd., Malaysia
Flag:	Panama
Classification:	ABS, +A1 Accommodation Barge +DPS-2

An artists impression of the *Nordic Constructor*.



Dynamic positioning capability graph.

is lifted off in an emergency situation, lashing hooks and wires are automatically released.

"At the premium end of the market, you need a top-end gangway that guarantees safety as well as being able to efficiently move up to 400 men on or off the barge," said Mr Gauksheim.

The first two vessels will be delivered in mid-2010 with vessels three and four due to be completed in mid-2011. One of the vessels has been sold to B+H Equimar, a subsidiary of publicly-listed B+H Ocean Carriers Ltd. Charter party contracts have been signed with Quippo MDL Energy covering two vessels, which will see at least one of the vessels deployed off India for three years post-delivery. Nordic intends to own and operate the fourth ship on its own accord.

Nordic has marketed the vessels as comparable to hotel standards on account of the relatively luxurious accommodation they will offer. Each will feature a gymnasium, internet cafe, cinema and lounge. Most rooms will be limited to one or two beds and come fitted with cabin entertainment system. An elevator is fitted for access to the six floors to ensure compliance with Australian regulations.

Nordic Maritime's chief operating officer Kjell Gaukrheim.

The vessels can house up to 400 men while a pedestal deck crane of up to 300tonnes capacity can be fitted for use on construction works supported by suitable storage and transfer capacity - the main deck load area is measured at 12.5 tonnes/m^2 with a clear deck area of 1250 m^2 and deck height of 3m.

The design also features welding, maintenance and cutting facilities in its workshop, while a helipad has capacity to receive a Sikorsky S92 helicopter.

"We are targeting the premium end of the market so we wanted to make sure the accommodation side of the design was suitable for operation anywhere in the world whatever the regulations," said Mr Gauksheim.

"The Gulf of Mexico, Brazil, parts of Asia and Australia all have huge accommodation requirements and there are very few companies able to supply lifting and accommodation facilities with DP2 class capability of the type we're building."

The delivery of the new vessels will mark a continuation of a diversification strategy embarked on earlier this decade by Nordic Maritime, which celebrated its tenth anniversary during 2009. After starting life as a seismic vessel management company, founder and CEO Morten Innhaug has rapidly transformed the company into a multi-dimensional shipping group offering project management, newbuilding, conversion and design services, agency, broking, chartering, as well as operating its own fleet of 2D seismic vessel and offshore support vessels.

With the delivery of the AFDVs, Mr Innhaug hopes to establish Nordic as a full turnkey provider of Engineering, Procurement & Construction solutions by 2012, with the acquisition of the engineering expertise required on projects like well-abandonment, rig commissioning or decommissioning, diving support and ROV operations next on the agenda.

"I think we've proven over the years with our various innovative designs and our conversions that we have the flexibility to be a success over the next ten years in this new challenge," said Mr Innhaug. "We're looking at designing and building or buying new DP vessels suitable for work in harsh marine environments, so once we have the engineering expertise in place we'll be able to bid for FPSO commissioning or decommissioning contracts, subsea, ROV, diving support or any other type of EPC contract." *NA*

TẠP CHÍ

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Kim cương vẫn sáng trong sương mù suy thoái kinh tế

Nghành đóng tàu Việt Nam đã được xác định là một ngành chủ chốt cho nền kinh tế quốc gia. Có một kỳ vọng thực tế rằng với sự ủng hộ tài chính của chính phủ thông qua các đơn hàng và tiền mặt sẽ hỗ trợ các nhà điều hành vượt qua giai đoạn suy thoái kinh tế hiện hành.

Đáng buồn cho ngành công nghiệp đóng tàu phôi thai của Việt Nam, được đại diện chủ yếu bởi sự hiện diện của Tập đoàn Vinashin bao trùm 80% năng lực đóng tàu quốc gia, ánh hào quang bị khuyết từ những viên kim cương mặc dù đất nước hiện nay vẫn kiên quyết trong tiến trình đóng tàu.

Thâm nhập vào thị trường đóng tàu cỡ lớn quốc tế bằng đơn hàng từ Graig Shipping gồm 27 tàu hàng khô Diamond 53 và 10 tàu Diamond 34 đã không hoàn toàn thành hiện thực.

Theo một thành viên trong ngành công nghiệp đóng tàu Việt Nam thì 8 trong số 27 tàu theo đơn hàng của sê ri tàu Diamond 53 đã được đóng, trong khi đó thêm 3 tàu nữa hiện đang được thảo luận và có thể được đóng nhưng còn 16 tàu thì có thể không bao giờ được đóng.

Câu chuyện của Diamond 34 "là một câu chuyện buồn", theo nguồn tin. "Một trong những tàu này đã được đóng, một tàu thì đang trên triền đà và một tàu đang trong giai đoạn đóng block, có tin đồn rằng một tàu khác đã bị hủy nhưng đó là không chính thức," ông nói. Trong khi đó, sáu tàu còn lại của Diamond 34 chưa có gì chắc chắn.

"John Coffin [Giám đốc điều hành của Graig Shipping tại Trung Quốc] cho rằng chất lượng của các tàu được đóng tại Việt Nam đã tốt hơn so với các tàu tương tự được đóng tại các nhà máy của Trung Quốc" ông nói. "Đó là một dự án tốt nhưng thị trường đã sụp đổ sớm hơn dự kiến của Vinashin" ông nói thêm.

Đóng tàu, mặc dù trong giai đoạn đầu tại Việt Nam, được mong muốn sẽ tồn tại trong giai đoạn suy thoái, chủ yếu do chính phủ xác định duy trì ngành công nghiệp bằng cách bơm khoản tiền đáng kể cùng với đơn hàng lớn từ Tổng công ty Hàng Hải Việt Nam và chính phủ.

Tên Nhà Máy	Khả năng sản xuất
Nhà máy Đóng tàu Sài Gòn	• Trước kia nhà máy chỉ có thể đóng các thuyền, tàu hai thân và thuyền buồm có trọng tải khoảng 1000dwt phục vụ cho vận tải nội địa, bây giờ nhà máy có khả năng đóng tàu 6500dwt. • Nhà máy đang đóng mười tàu hàng tổng hợp theo đơn hàng của Midland Shipping của Canada, mỗi tầu có trọng tải 5.190 dwt, giao vào năm 2009. Những tàu này được dự định cho hoạt động trên cả sông và biển. • Vinashin đang có kế hoạch nâng cấp nhà máy này cho đóng mới và sửa chữa tàu có trọng tải đến 22.500 dwt.
Công ty công nghiệp đóng tàu Hoàng Anh	Nhà máy này đã được phát triển từ một nhà máy đóng tàu nhỏ và các công ty và trở thành một thành viên của Vinashin tháng 5 năm 2003. Nhà máy có khả năng đóng lên đến mười tàu có trọng tải 2500-3000dwt một năm.
Aker yards - Việt Nam (nay là Công ty Dịch vụ Dầu Khí STX-Việt Nam)	Nhà máy mới mới này sẽ giao tàu dịch vụ AHTS đầu tiên trong năm 2010 và hiện có sáu tàu dịch vụ AHTS 4.000 dwt trong sổ đặt hàng.

Bảng 1. Hoạt động đóng mới và sửa chữa ở các nhà máy đóng tàu phía Nam. Nguồn Công nghiệp đóng tàu tại Việt Nam, theo Ban Thư ký OECD (tháng 5 năm 2008).

Tàu Graiglas một trong những tàu Diamond 53 được đóng tại Công ty đóng tàu Hạ Long.

Có khoảng 80.000 lao động, hoặc làm việc tại các nhà máy đóng tàu của Vinashin hoặc trong các ngành công nghiệp phụ trợ và vì thế chính trị cũng như kinh tế không phải là một lựa chọn cho chính phủ để cho phép các nhà máy đóng tàu đóng cửa.

Chính phủ Việt Nam sẽ vay 500 tỷ USD từ Ngân hàng Phát triển quốc tế, Tập Đoàn Kinh Tế Vinashin (Các Tổng công ty đóng tàu Việt Nam) vận hành khoảng 200 công ty con, sẽ được hưởng lợi vì 200 triệu USD của số tiền này được dành để hỗ trợ đóng những tàu Vinashin đã được đặt, nhưng chủ tàu không trả tiền.

"Chúng tôi sẽ đóng các tàu và bán lại" Ông Nguyễn Quốc Ánh, tổng giám đốc kinh doanh tập đoàn Vinashin cho biết. Ông nói thêm: "Nhiều chủ tàu không phải ở vị trí trả tiền cho các tàu họ đã đặt đóng nhưng chúng tôi đã tái bán được ba tàu Diamond 53 cho chủ tàu Đức". Điều gì đã xảy ra khi mà ở thị trường cho người mua đã đặt 31,1 triệu USD cho mỗi tàu, cao hơn so với các hợp đồng đóng ban đầu có giá khoảng 25-26 triệu USD.

Theo ông Ánh báo chí địa phương không hiểu ngành công nghiệp đóng tàu và báo cáo rằng công ty sắp phá sản, gây ra sự tức giận đáng kể trong Tập đoàn Vinashin. Tuy nhiên ông Ánh cũng thừa nhận rằng chỉ có năm nhà máy lớn nhất có kín đơn đặt hàng sẽ đảm bảo việc làm cho đến năm 2012. Ông cũng thừa nhận rằng trong khi các đơn đặt hàng của công ty là 11 tỷ USD ba năm trước, con số đó đã giảm hơn 50% về còn 4,7 tỷ USD cho đến cuối năm 2010.

Các đơn hàng giảm, một hiện tượng toàn cầu lan tỏa tất cả các nhà máy đóng tàu đã ngay tức khắc dấy lên nỗi lo sợ về sự sụp đổ của một nghành công nghiệp cung cấp ngoại tệ chủ chốt và vượt khỏi ranh giới ảnh hưởng đến các nghành công nghiệp khác như là sản xuất thép và các ngành công nghiệp phụ trợ khác.

Chính sách của Việt Nam đi theo hướng công nghiệp hàng hải toàn cầu, tuy nhiên, cũng nói lên nét riêng. Khoản vay nợ 1.500 tỷ đồng (83,5 triệu USD), cộng với 3.000 tỉ đồng trái phiếu chính phủ (167,9 triệu USD) vốn bổ sung ngoài các khoản vay 200 triệu USD giúp duy trì hoạt động của Vinashin.

Những khoản tiền ứng trước sẽ đóng vai trò trong bảo vệ nền kinh tế rộng lớn hơn cũng như các lợi ích nghành đóng tàu. Báo cáo năm 2008 của Tổ chức Hợp tác Kinh tế và Phát triển (OECD) về ngành đóng tàu Việt Nam đã nêu ra: "Công nghiệp đóng tàu là một ngành công nghiệp rất hấp dẫn cho các nước đang phát triển vì mang lại một lượng lớn ngoại tệ, do giao dịch tại thị trường này phần lớn được thực hiện bằng đô la Mỹ ".

Đây không phải là một con đường mới, mà đã được minh chứng bởi Nhật Bản, Nam Triều Tiên và Trung Quốc trước Việt Nam.

Bản báo cáo tiếp tục giải thích: "Ngành công nghiệp đóng tàu ảnh hưởng đến nền kinh tế Việt Nam theo nhiều chiều hướng tích cực, chẳng hạn như hỗ trợ các ngành vận tải, tăng số việc làm, hỗ trợ sự phát triển của công nghệ trong tất cả các ngành công nghiệp liên quan đến đóng tàu và kích thích nhu cầu cho các sản phẩm

Tên Nhà Máy	Khả năng sản xuất
Nhà máy Đóng tàu Dung Quất	• Vinashin là nhà đầu tư duy nhất và cuối cùng sẽ là một trong những nhà máy đóng tàu lớn nhất ở Đông Nam Á và nằm trong Khu kinh tế Dung Quất. Nhà máy được xây dựng để đóng tàu đến cỡ lớn VLCC trên các ụ có kích thước 520m x 110m và 380m x 86m và một cầu tàu dài 3000m. Nhà máy cũng sẽ đóng mới hai tàu Aframax 104.000 dwt và các tàu chở dầu VLCC cho Petrovietnam.
Nhà máy Đóng tàu Hyundai-Vinashin	• Nhà máy này là liên doanh giữa Vinashin (với quyền sở hữu 30%) và Hyundai Mipo Dockyard Hàn Quốc. Ban đầu là nhà máy sửa chữa tàu lên đến 400.000 dwt nhưng đã được nâng cấp và hiện nay cũng có khả năng đóng mới cho nghành dầu khí
Công ty Công Nghiệp Đóng tàu Nha Trang (Nha Trang SICO)	• Nhà máy này đóng 12 tàu vận tải hàng hóa trọng tải 20,000-36,000 dwt và tàu container 250TEU với tổng giá trị 462 triệu USD cho công ty Đầu tư Dầu khí Vinashin, Công ty Cổ phần Vận tải, Công ty Vận tải biển Viễn Dương Vinashin và Công ty Phát triển công nghiệp phía Nam. Tất cả bốn công ty này đều là thành viên của Tập đoàn Kinh Tế Vinashin và tàu đầu tiên sẽ được bàn giao vào năm 2009 và đơn hàng này sẽ hoàn thành vào năm 2011.
Nhà máy Đóng tàu Đà Nẵng	• Nhà máy đóng tàu này có khả năng đóng các tàu vận tải hàng hóa 20.000 dwt và sửa chữa tàu 30.000 dwt và được trang bị những công nghệ đóng tàu tiên tiến. Nhà máy có vốn đầu tư ban đầu khoảng 38 triệu USD.
Nhà máy Đóng tàu Phú Yên	• Nhà máy đóng tàu này hiện tại đang đóng tám sà lan 200 dwt cho một công ty trong nước và bốn tàu đánh cá 600 hp cho khách hàng Hiệp hội các Quốc gia Đông Nam Á. Sau khi hoàn thành giai đoạn thứ hai nhà máy sẽ có thể đóng các tàu cá 1000 hp và tàu chở hàng 3000 dwt.

Bảng 2. Hoạt động đóng mới và sửa chữa ở các nhà máy đóng tàu miền Trung

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For manufacturing Kawasaki-brand steering gears and deck machinery, we have production centers in Japan, Korea and China, three countries that together account for more than 80% of the new ships built in the world today. Local production in countries where new ships are regularly manufactured is, we believe, the key to both reliability and economy.

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High-pressure, compact, easy to install and maintain, Kawasaki steering gears are proud of long history and rank No. 1 in the world in terms of quantity delivered: over 16,000 ships have been equipped with them. As quiet, high-pressure systems, our deck machinery has also earned a superior reputation, and in this field, too, we have achieved world-class results, equipping over 5,500 ships.

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Phone: 81-78-991-1133 Fax: 81-78-991-3186

Kawasaki Precision Machinery (UK) Ltd.
Ernesettle Lane, Ernesettle, Plymouth, Devon PL5 2SA, United Kingdom
Phone: 44-1752-364394 Fax: 44-1752-364816

Bảng 3. Hoạt động đóng mới và sửa chữa ở các nhà máy đóng tàu miền Bắc

Tên Nhà Máy	Khả năng sản xuất
Nhà máy Đóng tàu Hạ Long	• Nhà máy này là một trong những nhà máy được chọn để đóng tám tàu hàng khô 53.000 dwt cho Graig Investment. Nhà máy cũng đóng các tàu container 1700 TEU và 3200 TEU cho Vinalines và một loạt các tàu vận tải 12.000 dwt cho các khách hàng Việt Nam. • Nhà máy được thành lập năm 1976 với sự hỗ trợ từ Ba Lan, vẫn duy trì mối liên hệ mang tính lịch sử, sử dụng các thiết bị chủ yếu từ Ba Lan. • Kế hoạch mở rộng nhà máy đóng tàu đang được tiến hành với một triền đà và một ụ khô đang được xây dựng, với kế hoạch tăng lượng lao động từ 3000 lên 5000 trong ba năm tới.
Nhà máy Đóng tàu Bạch Đằng	• Nhà máy này có khả năng đóng khoảng tám tàu 20.000 dwt cùng lúc. Trong năm 2006, nhà máy đóng một tàu chở dầu 13.500 dwt và hai tàu chở hàng khô handysize cho Nhật Bản. Nhà máy cũng bàn giao một tàu container 610 TEU cho Công ty vận tải biển Biển Đông. Nhà máy đã bắt đầu sản xuất động cơ Mitsubishi tàu thủy trong dải công suất từ 8.400 đến 32.000 hp.
Nhà máy Đóng tàu Nam Triệu	• Nhà máy này được Vinashin giao cho đóng bảy tàu 53.000 dwt cho Graig cũng như các tàu chở hàng tổng hợp cho Vinalines. Nam Triệu đóng tám tàu ô tô 6.900 đơn vị cho hãng Hoegh Autoliner (Na Uy). Ngoài ra, Vinashin bắt đầu đóng kho chứa dầu nổi (FSO) 150.000 dwt lớn nhất đất nước và sẽ là một thành phần quan trọng trong sự phát triển của trữ lượng dầu đối với PetroVietnam tại nhà máy này. FSO này được dự kiến đóng trên một triền đà đặc biệt với thời gian trên 18 tháng.
Nhà máy sửa chữa tàu Phà Rừng	• Trong giai đoạn 2003-2004, một dấu mốc quan trọng trong sự phát triển của nhà máy Sửa chữa tàu Phà Rừng (Tổng Công ty đóng tàu Phà Rừng hiện nay), khi nhà máy bắt đầu đóng mới thay vì chỉ sửa chữa. Vinashin đã cho phép nhà máy Sửa chữa tàu Phà Rừng nâng cấp và mở rộng nhà máy để sửa chữa tàu 16.000 dwt và đóng mới tàu 35.000 - 40.000 dwt. • Nhà máy sẽ đóng một số tàu hàng khô 34.000 dwt cho Graig Investments của Anh và tàu chở hóa chất 6.500 dwt và 13.000 dwt.
Nhà máy Đóng tàu Sông Giá	• Nhà máy đóng tàu Phà Rừng đã bắt đầu việc xây dựng một nhà máy đóng tàu tiên tiến nhất tại Việt Nam cho đến nay, chi phí gần 312,5 triệu USD. Được hoàn thành vào cuối năm 2007, nhà máy đóng tàu Sông Giá sẽ có khả năng đóng mới 26 tàu biển một năm, với trọng tải từ 50.000 dwt đến 70.000 dwt.
Nhà máy Đóng tàu Nghi Sơn	• Trong tình hình hiện tại nhà máy này có khả năng đóng mới và sửa chữa tàu biển với trọng tải lên đến hơn 50.000 dwt. Trong giai đoạn II (2010), Nhà máy đóng tàu Nghi Sơn sẽ được nâng cấp với việc chi 57 triệu USD để tăng gấp đôi khả năng đóng mới và sửa chữa tàu biển với trọng tải lên đến 100.000 dwt.
Nhà máy Đóng tàu Bến Kiền	• Nhà máy đã này giao tàu hàng 8.700 dwt cho Tập đoàn Kanematsu Nhật Bản và đang đóng mười tàu đa năng MPP 4600dwt cho Clipper Group của Đan Mạch và các tàu xi măng 14.000 dwt cho chủ tàu Na Uy.

trong nước".

Với những lý do này mà Chính phủ Việt Nam đã coi đóng tàu là một ngành công nghiệp xuất khẩu chính và đã đẩy mạnh đầu tư trong phạm vi của Chương trình Phát triển Công nghiệp tàu thủy 2002-2010.

OECD kết luận: "Ngành công nghiệp đóng tàu của Việt Nam đang tăng trưởng nhanh chóng và tạo ra những cơ hội tốt cho các công ty nước ngoài cung cấp thiết bị hàng hải và các dịch vụ".

Trong văn bản báo cáo về công nghiệp đóng tàu Việt Nam, được công bố vào mùa hè năm 2008, OECD đã không đề cập đến thảm họa kinh tế xảy ra vài tháng sau đó.

Vẫn quay cuồng trong khủng hoảng kinh tế toàn cầu, đóng tàu là "điên tại thời điểm này", ông Ánh thừa nhận với sự tuột dốc của tỷ giá và sự sụp đổ của nhu cầu đóng mới tàu biển đã để lại cho người mới vào cuộc một vị trí bấp bênh.

Không thể nói rằng với đơn hàng đóng mới các tàu từ Vinalines, Tổng Công ty Hàng Hải thuộc sở hữu nhà nước, các nhà máy đóng tàu lớn sẽ đảm bảo việc làm cho đến ít nhất là năm 2012. Hợp đồng 40 tàu đóng mới đã được sự chấp thuận của thủ tướng chính phủ trong tháng 9 năm 2009.

Đơn hàng này bao gồm các tàu hàng khô 22.000 dwt, 34.000 dwt và 53.000

dwt, các tàu chở dầu sản phẩm 50.000 dwt, các tàu chở dầu thô105.000 dwt và các tàu container 1.800 TEU và 3.200TEU. Theo ông Ánh, đơn hàng này có giá trị lớn hơn 200 triệu USD và nó sẽ duy trì hoạt động của tập đoàn.

Tuy nhiên, cũng theo ông Ánh, không phải chỉ có hợp đồng các đơn hàng từ các công ty vận tải biển thuộc sở hữu nhà nước được ký tại thời điểm này. Điều này cũng được xác nhận bởi ông Devapriya Senarath Bandara Senanayake, đại diện Đăng kiểm Nauy (DNV) tại Việt Nam, rằng bốn đơn hàng đóng tàu chở ô tô hạng Horizon đã được đặt với Tổng công ty công nghiệp tàu thủy Nam Triệu thuộc Vinashin. Mỗi chiếc có chiều dài 199m, rộng 42 m và có sức chứa 7.400 ô tô được đóng từng phần với thiết kế mũi vuông đặc biệt.

Công ty đóng tàu Hạ Long thuộc Vinashin đã ký hợp đồng có bốn tàu ô tô nhỏ hơn với sức chứa 4.900 xe đang được đóng cho NYK Lines thuê và có thêm bốn tàu tùy chọn cho chủ tàu.

Công ty Đóng tàu Dầu khí Việt Nam (PV Shipyard) được thành lập trong năm 2008 đã bắt đầu đóng dàn khoan loại jack-up đầu tiên và là loại dàn khoan đầu tiên được đóng tại Việt Nam. Le Tourneau (Mỹ) đã được lựa chọn để thiết kế dàn khoan 60 m này, PV Shipyard đồng thời là nhà máy đóng mới và chủ sở hữu. Giàn khoan đóng xong sẽ được cho Vietsovpetro thuê, một liên doanh 50/50 giữa chính phủ Nga và Việt Nam.

Ông Senanayake nói rằng ngành công nghiệp đóng tàu, nói chung là đang đi qua một thời kỳ khó khăn nhưng ở Việt Nam vẫn có những đơn hàng đang được hoàn thành, mặc dù việc giảm một số đơn hàng cũng phản ánh những khó khăn trong ngành công nghiệp này.

Graig, có các đơn hàng với các đối tác của họ đã dẫn đến sự phát triển của ngành công nghiệp đóng tàu tại Việt Nam, giờ đây đã bán có lãi được phần lớn các tàu trong sê ri tàu Diamond và đang tập trung vào công việc giám sát đóng tàu.

Công ty, thông qua bộ phận Quản lý tàu của Graig, đã chuyển sự chú ý đến đào tạo tài trợ hai mươi thực tập sinh Việt Nam. Theo một thỏa thuận với Trường Đại học Giao thông vận tải Hồ Chí Minh và STC, đơn vị cung cấp dịch vụ đào tạo Hà Lan, vận hành các trường đại học hàng hải, 10 sinh viên năm thứ hai và 10 sinh viên năm thứ ba sẽ hoàn thành khóa đào tạo cho chứng nhận đầu tiên và cũng là cử nhân trong nghiên cứu hàng hải. Các thực tập sinh cũng sẽ phải hoàn tất một khóa học tiếng Anh quốc tế chuyên sâu.

Về cơ bản công ty Anh quốc đã giúp thúc đẩy ngành đóng tàu Việt Nam và bây giờ là giúp đỡ đào tạo các thủy thủ. Mặc dù các tàu Diamond dường như không tỏa sáng như ban đầu nhưng vẫn duy trì ngọn lửa và có thể dẫn dắt ngành công nghiệp đến thành công trong tương lai. ***NA***

Các tàu hàng khô đã giao cho chủ tàu Đức

Tàu E.R Bergamo là tàu thương mại lớn nhất được đóng tại Việt Nam cho đến nay và là chiếc đầu tiên trong sê ri tàu hàng khô 'supramax' loại 56.000 dwt đã được giao vào tháng 7 năm 2009 bởi nhà máy đóng tàu Hyundai Vinashin cho chủ tàu E.R. Schiffahrt ở Hamburg.

Nhà máy được thành lập vào năm 1999 như là một liên doanh giữa Vinashin (với quyền sở hữu 30%) và Hyundai Mipo Dockyard của Hàn Quốc và tập trung vào sửa chữa và hoán đổi tàu. Đây là chiếc tàu hàng khô đầu tiên được đóng tại nhà máy. Chiếc tàu cùng loại thứ hai E.R. Bologna cũng đã được giao cho chủ tàu vào cuối tháng 10 năm 2009 và hai chiếc tiếp theo sẽ được giao trong nửa đầu năm 2010 theo kế hoạch.

Những tàu này nằm trong số 10 tàu hàng khô 'supramax' đặt với Hyundai bởi E.R. Schiffahrt trong năm 2007 với một hợp đồng trị giá tổng cộng khoảng 470 triệu USD với lịch trình giao hàng vào năm 2009 và 2011. Tất cả các tàu được cho thuê dài hạn trong đó tàu E.R. Bergamo đang được cho công ty vận tải biển Hanjin Hàn Quốc thuê.

Nhà máy đóng tàu Hyundai - Vinashin đã đầu tư hơn 100 triệu USD trong việc nâng cấp cơ sở hạ tầng và mua thiết bị mới để nâng cấp từ sửa chữa sang đóng mới, ông Vũ Minh Phú, Phó tổng giám đốc của nhà máy cho biết. ***NA***.

TECHNICAL PARTICULARS	
E. R. Bergamo	
Chiều dài	187.0m
Chiều rộng	32.3m
Mớn nước	12.9m
Trọng tải	55.517 dwt
Dung tải thô	32.613 gt
Thể tích hầm hàng	70.000 m^3
Máy chính B & W	6S50MC-C7
Tốc độ	14,5 hải lý/giờ
Lượng tiêu thụ dầu	32.3 tấn/ngày
Tầm hoạt động	16.700 hải lý
Cần cẩu boong	4 x 30 tấn
Đăng kiểm	DNV
Cờ	Liberia

Tàu E.R. Bergamo đầu tiên trong các tàu hàng khô 'supramax' được giao bởi nhà máy đóng tàu Hyundai-Vinashin

Diamond lights fade in fog of recession

Shipbuilding in Vietnam has been confirmed as a vital industry to that country's economy. And with the government's financial backing through cash and orders there is a real expectation that it will support the yard operator through the current recession.

Sadly for Vietnam's embryonic shipbuilding industry, mainly represented by the sprawling Vinashin Group that operates 80% of the country's capacity, the shine has waned from their diamonds though the country is now firmly in the shipbuilding loop.

Originally seen as a Vietnam's entry into the big-ship building league Graig Shipping's order for 27 bulk carriers of 53,000dwt and a further 10 orders for the 34,000dwt version of the Diamond ships has failed to fully materialise.

According to a Vietnamese shipbuilding industry insider up to eight of the 27 planned Diamond 53's have been built, while a further three are currently being discussed and may materialise, but a further 16 ships may now never be built.

The tale of the Diamond 34's "is a sad story", said the source. "One ship has been built, another is on the slipway and a third is on the blocks, but it is rumoured that one other has been cancelled, but that's not official," he said. Meanwhile, the remaining six Diamond 34 ships must be considered a doubt.

"John Coffin [Graig Shipping's CEO in China] said that the quality of the vessels built in Vietnam was better than that of similar vessels built in Chinese yards," said the shipping source. "It was a nice project but the market collapsed earlier than Vinashin had expected," he added.

Shipbuilding, although in its early stages in Vietnam, is expected to survive the recession mainly because the Hanoi Government appears to be determined to maintain the industry by injecting significant funds along with a major order from the state owned national shipping company and the government of Vietnam.

Some 80,000 workers either work in the Vinashin yards or in related industries and so politically as well as economically it is not an option for the government to allow the yards to fail.

Name of shipyard	Construction/Production capabilities
Saigon shipyard	• While in the past the company could only build boats, catamarans and sailing yachts with a capacity around 1000dwt for inland transportation, it is now capable of building 6500dwt vessels. • The yard is to build ten general cargo ships ordered by Midland Shipping of Canada, each of 5190dwt, for delivery by 2009. These are intended for river and sea operations. • Vinashin is planning to upgrade this shipyard for newbuilding and repairing vessels up to 22,500dwt.
Hoang Anh shipbuilding industry company	This yard was developed from a small shipyard and the company and became a member of Vinashin in May 2003. It has the ability to build up to ten vessels of 2500-3000dwt a year.
Aker yards – Vietnam *(now STX - Vietnam Offshore Ltd)*	This new yard will deliver its first AHTS (Anchor Handling Tug Supply) vessel in 2010 and currently has six 4000dwt AHTS in its order book.

Table 1. New building and repair activities in main south cluster shipyards. Source *The shipbuilding industry in Vietnam*, complied by the OECD secretariat (May 2008).

Graiglas one of the Diamond 53 design bulk carriers built at Ha Long shipyard.

The Royal Institution of Naval Architects

WARSHIP 2010

Advanced Technologies in Naval Design and Construction.

9 - 10 June 2010

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The Hanoi Government will borrow US$500billion from the International Development Bank, Vinashin Business Group (The Vietnamese Shipbuilding Corporation) which operates some 200 subsidiaries, will benefit because US$200million of this money has been earmarked to support Vinashin to build vessels that have been ordered, but whose owners can no longer pay for the ships.

"We will build the ships and re-sell them," explained Vinashin Business Group's chief business officer Mr Nguyen Quoc Anh. He added: "Many owners are not in a position to pay for the ships they ordered, but we have re-sold three 53,000dwt Diamond handymax ships to German owners already". What is more the sales that have taken place in essentially a buyers market were set at US$30.1million per ship, higher than the original building contract which was around US$25-26million.

According to Mr Anh the local press do not understand the shipbuilding industry and reports that the company is about to go bankrupt, although wide of the mark, have caused considerable anger within the Vinashin Group. Even so Mr Anh concedes that only the five biggest yards have full orderbooks that will provide work until 2012. He also admits that while the company's orders stood at US$11billion three years ago that figure has now fallen by more than 50% to US$4.7billion taking the company up to the end of 2010.

It is this decline in the orders, a global phenomenon that has blighted all newbuilding yards, that has prompted fears of a collapse of an industry that provides vital foreign currency and employment for workers beyond the confines of the yards themselves in related industries such as steel and component manufacturing.

Hanoi's policy towards the global maritime industry, however, tells its own story. A VND1.5trillion (US$83.5million) debt repayment, plus a VND3trillion (US$167.9million) equity injection in addition to the US$200million in loans, should keep Vinashin afloat.

These cash advances will play a role in securing the wider economy as well as the shipbuilding interests. According to the 2008 Organization for Economic Co-operation and Development (OECD) report on Vietnamese shipbuilding states: "Shipbuilding is a very attractive industry for developing nations as it can bring in substantial amounts of foreign currency, due to transactions in the market being largely carried out in US dollars".

This is not a new path, but rather one that has been well trodden by the Japanese, South Koreans and Chinese ahead of the Vietnamese venture.

The report went on to explain: "The shipbuilding industry affects the Vietnam economy in various positive ways, such as supporting the shipping industry, increasing employment, assisting the development of technology in all shipbuilding related industries and stimulating demand for domestic products".

It is for these reasons that the Vietnamese Government has made shipbuilding a key export industry and it

Name of shipyard	Construction/Production capabilities
Dung Quat shipyard	• Vinashin is the sole investor and will eventually be one of the largest shipyards in South East Asia and located in Dung Quat economic zone. The yard is constructed to build vessels up to VLCC in docks of 520m x 110m and 380m x 86m with a 3000m. quayside. It will also be the builder of Petrovietnam's two new 104,000dwt Aframax and VLCC tankers.
Hyundai-Vinashin shipyard	• This yard is a joint venture between Vinashin (with 30% ownership) and the Korean Hyundai Mipo Dockyard. It was originally built as a repair yard for vessels up to 400,000dwt but has been upgraded and is now also capable of offshore structures.
Nha Trang shipbuilding industry company (Nha Trang SICO)	• This yard is to build 12 cargo freighters of 20,000-36,000dwt and three 250TEU container carriers with a total value of US$462 million for Vinashin Petroleum Investment, Transport Joint Stock Company, Vinashin Ocean Shipping Company and Southern Industrial Development Company. All these four companies are the members of Vinashin Business Group and the first ship will be handed over by 2009 and the order to be completed by 2011.
Danang shipyard	• This yard is capable of constructing cargo freighters of 20,000dwt and repairing ships of 30,000dwt, and is also equipped with advanced shipbuilding technologies. It has an initial investment capital of around US$38 million.
Phu Yen shipyard	• This shipyard is currently building eight barges of 200dwt for a domestic company and four fishing vessels of 600hp each for ASEAN clients. Upon completion of the second phase it will be able to construct fishing vessels of 1000hp and cargo ships of 3000dwt.

Table 2. New building and repair activities in main centre cluster shipyards.

Table 3. New building and repair activities in main north cluster shipyards.

Name of shipyard	Construction/Production capabilities
Ha Long shipyard	• This yard is one of those selected to build eight of the 53,000dwt bulk carriers for Graig Investment. It is also the builder of 1700TEU and 3200TEU container vessels for Vinalines and a series of 12,000dwt freighters for Vietnamese customers. • This was founded in 1976 with assistance from Poland, with which it maintains an historical connection, and it mainly uses Polish equipment. • Expansion plans at the shipyard are already underway with a new slipway and dry dock under construction, with plans to increase its workforce from 3000 to 5000 over the next three years.
Bach Dang shipyard	• This shipyard is capable of building about eight ships at the same time of around 20,000dwt each. In 2006, it built a 13,500dwt oil tanker, and two handysize dry cargo vessels for Japan. It also delivered a 610TEU container ship to the Bien Dong Transport Company. Bach Dang yard has begun manufacturing Mitsubishi marine engines in the 8400 to 32000hp range.
Nam Trieu shipbuilding industry company	• This yard has been tasked by Vinashin to build 7 of the 53,000dwt vessels for the Graig as well as general cargo vessels for Vinalines. Nam Trieu company will build eight 6900 units car carriers for Hoegh Autoliner (Norway). Also, Vinashin started construction on the country's biggest 150,000dwt floating storage offloading (FSO) vessel that will be a key component in the development of Vietnam's offshore oil reserves for PetroVietnam in this yard. The FSO is scheduled for construction on a specially outfitted slipway over 18 months.
Pha Rung ship repair yard	• In 2003-4, an important landmark was seen in the development of Pha Rung Ship Repair Factory (Pha Rung Shipbuilding Company today), when the factory began to build vessels instead of just repairing them. Vinashin has allowed Pha Rung Ship Repair Yard to upgrade and expand its factory for the repair of 16,000dwt vessels and construction of 35,000- 40,000dwt vessels. • The Pha Rung yard will construct some bulk carrier vessels of 34,000dwt for Graig Investments of the UK and chemical tankers of 6500dwt and 13,000dwt.
Song Gia shipyard	• Pha Rung Shipbuilding Company has started to the construction of the most advanced shipyard in Vietnam to date, costing nearly US$312.5 million. To be completed by late 2007, Song Gia shipyard will be capable of building 26 ocean going ships a year, with capacities ranging between 50,000dwt and 70,000dwt.
Nghi Son shipyard	• In its current configuration this yard is able to build and repair ocean going ships of over 50,000dwt. In the second phase (2010) the Nghi Son Shipyard will be upgraded through the expenditure of US$57 million to double its capacity to 100,000dwt.
Ben Kien shipyard	• This yard delivered 8700dwt cargo ships to the Japanese Kanematsu Corporation and is building ten 4600dwt MPP vessels for Denmark's Clipper Group and 14,000dwt cement vessels for Norwegian shipowner.

has boosted investments within the scope of the Shipbuilding Industry Development Program 2002-2010.

The OECD concludes: "Its [Vietnam's] shipbuilding industry is growing rapidly and creating good opportunities for foreign companies that provide marine equipment and services".

In writing the report on the Vietnamese shipbuilding industry, published in the summer of 2008, the OECD could not have envisaged the economic calamity that was to follow a few months later.

Still reeling from the global economic crisis shipbuilding is "crazy at this time", admits Mr Anh and with the collapse of demand and the subsequent failure of rates which have nosedived along with consumer demand so the demand for new ships has also collapsed leaving new entrants into the shipbuilding arena in a precarious position.

That cannot be said of Vinashin with a new order for vessels for Vinalines, the state owned shipping line, the group's major yards will have work until at least 2012. The 40 vessel newbuilding contract was approved by the prime minister in September 2009.

The order consists of 22,000dwt, 34,000dwt and 53,000dwt bulk carriers, 50,000dwt product tankers and 105,000dwt Aframax crude carriers and 1800TEU container feeders and 3200TEU regional container ships. This massive order was valued at more than US$200million by Mr

Anh and will itself maintain the group.

Orders for government owned lines are not the only contracts being signed at this moment, however, said Mr Anh. That view is confirmed by Devapriya Senarath Bandara Senanayake, Det Norske Veritas's (DNV) representative in Vietnam, confirmed that four orders for Horizon class car carriers had been placed with Vinashin's Nam Trieu yard. Each unit will measure 199m with a 42m beam and a capacity of 7400 cars created partly by its specially designed squared bow.

Vinashin's Halong yard has signed contracts for four smaller car carriers being built for charter to NYK Lines, with a capacity of 4900 cars, with a further four options available to owners.

Petrovietnam Marine Shipyard Company (PV Shipyard) has started building its first jack-up rig, and first jack-up rig to be built in Vietnam, following the establishment of the company in 2008. Le Tourneau (USA) was chosen to design the 60m jack-up rig, PV Shipyard is both the builder and the owner. Following its delivery the rig will be chartered to VietsovPetro, a 50/50 joint venture between the Russian and Vietnamese governments.

Mr Senanayake said that the shipbuilding industry, in general is going through a difficult period, but in Vietnam there are still orders being fulfilled, although, a reflection of the difficulties in the industry is seen through the reduction of some orders.

Graig, having placed the orders with its partners which led to the development of the shipbuilding industry in Vietnam, has now largely sold its interests in the Diamond vessels and is concentrating its work on supervising the builds.

The company, through Graig Ship Management, has turned its attention to training by sponsoring twenty Vietnamese officer cadets. Under an agreement with the Ho Chi Minh City-based University of Transport and Dutch education provider STC, which operates maritime universities, 10 second year and 10 third year cadets will complete their seatime leading to their first certificate and also a BSc in Maritime Studies on completion of their training. Each cadet will also complete an intensive internationally-recognised English course.

Essentially the UK company helped to boost Vietnamese shipbuilding and is now helping to train its sailors. Although the total number of Diamond vessels is unlikely to be realised the flame lit by the original order remains alight and could guide the industry to future success. *NA*

Bulk carriers delivered to German ship owner

E. R. Bergamo reported to be the largest commercial vessel to be built in Vietnam to date and the first in a series of 'supramax' class 56,000dwt bulk carriers was delivered in July 2009 to Hamburg-based ship owner E.R. Schiffahrt by Hyundai Vinashin shipyard.

The yard was established in 1999 as a joint venture between Vinashin (with 30% ownership) and Hyundai Mipo Dockyard in Korea and concentrated on repair and conversion work. This is the first bulk carrier the yard has ever built. A second sister ship *E.R. Bologna* was also delivered to the owner at the end of October 2009 and a two further vessels are schedules to be delivered within the first half of 2010.

These vessels form part of a ten supramax design bulk carrier order placed with Hyundai by E.R. Schiffahrt in 2007 at a total contract value of about US$470million with delivery scheduled between 2009 and 2011. All these vessels where to be on long term charters with *E. R. Bergamo* being chartered to Korean shipping company Hanjin.

The Hyundai – Vinashin shipyard has invested more than US$100million in upgrading infrastructure and buying new equipment in order to move from ship repairing to shipbuilding, said Mr Vu Minh Phu, the deputy general director of the shipyard. *NA*

TECHNICAL PARTICULARS

E. R. Bergamo

Length, oa	187.0m
Breadth	32.3m
Draught (scantling)	12.9m
Deadweight	55,783dwt
Gross tonnage	32,613gt
Cargo hold (grain)	70,000m^3
Main engine	B&W 6S50MC-C7
Speed	14.5knots
Fuel oil consumption	32.3tonnes/day
Cruise range	16,700nm
Deck cranes	4 x 30tonnes
Classification	Det Norske Veritas
Flag	Liberia

***E.R. Bergamo* first of the 'supramax' bulk carriers delivered by Hyundai-Vinashin shipyard**

The Royal Institution of Naval Architects

SHIP DESIGN AND OPERATION FOR ENVIRONMENTAL SUSTAINABILITY

10 - 11 March 2010, London, UK

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

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

Topics Include:

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United we stand

In assessing the evolving environmental landscape faced by the maritime sector Japan's Ocean Policy Research Foundation (OPRF) believes that the way forward for the industry is to join forces to "address the various challenges at hand immediately".

Over the long term, up to 2050, the world will experience a growth in population that will subsequently lead to a growth in economic activity requiring more ships to transport cargo in an environment that must see significant reductions in greenhouse gas (GHG) emissions.

This scenario was devised by the OPRF late last year and the response required by the Japanese think tank is for shipping to answer the clarion call to save the world from climate change.

Based on information from an Inter-governmental Panel on Climate Change Special Report on Emissions Scenarios the OPRF said that a projected increase in the global population from 6.46billion in 2005 to 8.67billion people will see global GDP increase from US$44.68trillion in 2005 to US$193.22trillion.

A method of analysis known as "backcasting" by the OPRF then calculated that the maritime sector would see a growth in seaborne trade from 29.04billion tonne miles in 2005 to 72.49billion tonne miles by 2050.

According to the OPRF this growth in the seaborne trade: "without efficiency improvements will result in the emission of 2.4billion tonnes of CO_2 by 2050." That would exceed the combined 2005 emissions of both Germany and Japan by 400million tonnes.

Clearly for an industry that already emits as much CO_2 as Germany this would be a step backward in the current climate where demands to cut GHGs are gathering momentum. According to the OPRF the maritime industry must make a two pronged response to these demands in order for the industry to meet its GHG obligations.

In the first instance the industry must develop ultra-low emission ships that will emit less than 50% of the CO_2 when compared to conventional ships operating in 2005. Emissions will be measured using the International Maritime Organization's Energy Efficiency operating Indicator. These ships will be operational by 2020 and will form some 22% of the world fleet by 2030.

Zero emission ships will be available by the mid-2030s and will form some 69% of the fleet by 2050 which would see a more than 50% reduction in CO_2 emissions.

"Lack of efficiency improvements will result in the emission of 2.4billion tonnes of CO2 by 2050." That would exceed the combined 2005 emissions of both Germany and Japan by 400million tonnes"

The technology for both of these evolutions in ship power and design already exist. In the case of ultra-low emission vessels which will operate at lower speeds and owners will be required to make modifications that would reduce the fuel consumption of vessels as well as preserving energy, such as heat energy, that is already produced.

Zero emission ships will, said the OPRF, utilise technology developed by around 2030 that will see alternative energy used to power vessels, such as renewables and gas as well as carbon capture and storage systems that prevent CO_2 from being released into the atmosphere.

The second proposal by the OPRF is to establish an international research institute that will "support the evolution of maritime society".

An institute of this nature would "improve the existing rule making system" and promote voluntary industry initiatives that would possibly lead to more stringent standards that would otherwise be imposed through mandatory standards.

A provisional name of the World Maritime Institute for Rules and Regulations could be "promptly established" said the OPRF. The institute would offer analysis of raw maritime data, develop an international maritime information network and submit information to international bodies to assist them in rule making.

Details of how this institute would be funded were comparatively light with some vague understanding that the industry itself would be a major source of funding. This could, however, compromise the organisation's independence which it would need if it were to be credible in the eyes of decision makers developing new industry rules.

Technical information on what international rules would be imposed or would focus on to promote the development of greener ships. Rules which the industry has failed to agree on some 12 years after the Kyoto protocol. Nor is it clear what, if any, market based mechanisms would be introduced to promote the development of ultra-low and zero emission ships.

A month after the Copenhagen summit the maritime industry appears to be still scratching around trying to find solutions to its inertia. In fact setting a base year of 2005, as the OPRF has done, could be construed as the maritime industry shirking its responsibility. All developing countries are setting targets that use 1990 as a base year, setting a target that allows for a further 15 years of growth in emissions could be construed as shipping again failing to take its responsibilities seriously. *NA*

Sail powered cargo ships go back to the future

Where do you go when you want to design and build a carbon neutral cargo ship? A power company of course. B9 Shipping is a subsidiary of the B9 alternative energy company based in Larne, Northern Ireland, and they are all but ready to build their new ship.

Meeting the needs of a new environmental regime was never going to be easy for shipping, but innovation along with the political will is the key to success. Shipping is being offered innovation through an unlikely source.

The B9 Energy group is more used to designing wind farms and tidal energy facilities than ships. Knowledge of this industry and its UK needs became the driver for B9 Energy as the company realised that the country's power producers were developing woodchip power stations that would import 300,000tonnes of the fuel a year from Latvia.

Here was an opening for an entrepreneurial company to find an environmentally friendly way of delivering woodchip fuel to the UK. B9 Shipping was established as a daughter company and the baby that it spawned is ready to be born.

David Surplus, chairman of B9 Energy said: "The B9 ship will operate with six crew, the same as any conventional coaster, but its costs will be far lower."

Designed by Rob Humphreys, based in Lymington, in association with the Wolfson Unit of Southampton University, Mr Humphreys is the same man that designed Ellen McArthur's yacht *Kingfisher* for her round-the-world jaunt. B9's vessel, however, is designed for much shorter journeys, but will carry 3000tonnes of cargo.

A commercial sailing vessel that will be fitted with a Rolls-Royce designed spark ignition engine that runs on biogas. The fuel will be produced through anaerobic digestion of food waste at a plant based in Kent, south-eastern UK.

Food waste as it is broken down by microbes produces methane that then powers the engine in a conventional way. The fuel is considered second generation carbon and as such is treated as carbon neutral.

B9 shipping ready to launch new green ship.

According to the design calculations some 60% of the vessel's thrust will be derived from wind and a further 40% from the engines, on average on the vessel's predicted northern European route, across the Baltic and North Sea to the UK's east coast and back.

A crew of six, the same as the number of crew on similarly sized conventional coasters, would run the ship: "But there would be no climbing up the rigging, electric motors would furl away the sails into the mast when they were not needed," explained Mr Surplus.

> "We would sell the blueprints for building the vessels abroad and local operators would then build the vessels locally to meet their own needs," said Mr Surplus"

The ship itself will be built using 1500tonnes of steel which will be produced by B9's partner Corus at its Halesowen plant, in Birmingham. The steel plate will be cut into slot together parts, much like a new wardrobe, and flatpacked. It will then be dispatched to a shipyard for construction; one yard in the frame for this work is the Pallion yard on Wearside. After putting the plates together the yard will use the MIG semi-automated welding system to secure the hull. In total the company believes it can assemble the hull within eight weeks.

Expertise in the UK remains significant in a region where shipbuilding has declined significantly over the last 60 years or so. In using local talent to design and build the new vessel the company will be making a statement about the direction that globalisation is taking industry.

"We are trying to keep all the work in the UK because we don't want to become part of globalisation and the use of cheap labour abroad, in any case the pound has fallen considerably so the costs of building the vessel here are not much more than building it abroad," explained Mr Surplus.

Building costs must be kept low for owners to profit from the building of a vessel, but the fluctuating costs of operation can often be the critical element between profit and loss for a vessel. In the case of the B9 ship the costs are largely predictable, but one element remains uncertain.

EU legislation in the form of the Renewable Energy Directive (RED) will mean that governments will have to ensure all modes of transport source 10% of their energy from renewable sources by 2020.

In the UK energy companies have an

The man behind B9 Energy

David Surplus graduated from the University of Newcastle-Upon-Tyne in 1980 as a Marine Engineer. After a brief two year spell at sea in the merchant navy to gain practical engineering experience he joined Lloyd's Register as an engineer surveyor.

During his 10 year career with Lloyd's Register, which involved both marine and offshore inspection work, David carried out private research into the subject of climate change. This progressed to his appointment as co-ordinator of the Lloyd's Register research project to establish rules and regulations to govern the standard of construction of wind turbines.

In 1992 David returned to Northern Ireland and formed the B9 Energy group of companies which have now developed 10 wind farm projects, gained contracts to operate and maintain 650 wind turbines on 45 wind farms, developed the world's first fully automated small scale down draft gasification wood fuelled combined heat and power plant, developed fourth generation enhanced anaerobic digestion technology and became the first wind farm operation company in the world to achieve accreditation to ISO14001, ISO9001 and OHSAS18001.

B9 Energy has partnered with StatKraft to develop tidal projects in Northern Ireland and David is a director of Wavebob from Dublin, one of the worlds leading wave energy technology companies.

David Suplus

obligation to source an increasing amount of energy from renewable sources and those companies that achieve those targets are issued with renewable obligation certificates (ROC) which are valued at 4.5p/kwh.

B9 has lobbied the UK's Department for Transport to introduce a similar system in the transport sector. With wind and biogas attracting double ROC payments in the energy generation sector the company expects that if the UK Government were to introduce a similar system for transport it would also receive double ROCs giving it a subsidy of 9p/kwh.

Such a system would give the operator of the B9 vessel an income of US$6000/day in addition to US$954/day acquired through emissions trading and US$2000/day in fuel cost savings. These comparisons were calculated using a 3000dwt bulk carrier operating with a 1.5MW maximum continuous rating engine burning five tonnes of MGO/day and with fuel costs set at US$600/tonne.

Total cost advantages of the B9 sailing ship over the conventional 3000dwt coaster would be US$8954/day, excluding any small penalties for NOx and SOx emissions, according to B9's calculations.

If these calculations are correct then the ship would be a very interesting proposition to coastal bulk carrier operators, who manage 1800 conventional vessels of this type around European waters. Further afield there some 10,000 coastal bulk carriers in the world that would be capable of using B9s technology and that makes the vessel an exportable technology.

"We would sell the blueprints for building the vessels abroad and local operators would then build the vessels locally to meet their own needs," said Mr Surplus.

Currently B9 has partnerships in place with MGT the power supplier and Corus which has agreed to provide the steel for the first vessel and it will produce the plating for any subsequent vessel orders. The company has bought "an off the shelf solution" from Rolls Royce which will supply the spark ignition engines. Furthermore, there is a tentative agreement with Graig Shipping in Cardiff, Wales, who will manage the building programme should the company finally achieve its goals and get the design accepted by the UK authorities.

An initial order of 50 ships is planned if the ROCs are introduced and the UK Government gives its backing to the project.

Effectively the company will initially need to have the ROC subsidies in place to support the vessels through their development phase, those subsidies could then be phased out as the ships become used on a wider scale.

If governments are serious about reducing carbon emissions from shipping then there is likely to be more than one solution to the problem. B9 Shipping's vessel design is a strong contender for offering a part of the reduction to shipping's carbon emissions.

Larger versions of the ship, extended to 5000dwt, can be built, according to David Surplus, who sees this project as a major development for his company. As an ex-Lloyd's Register man he understands the shipping industry and wants to see it move on to leaner and greener times.

In an effort to make that happen three wind power shipping companies B9, Greenwave and Skysails are considering an association to lobby government and the EU for funding for cleaner technology in transport. The message from David Surplus then is 'watch this space'. *NA*

Viking Lady steals the limelight

Billed as the world's first ever fuel cell ship *Viking Lady* arrived at the heart of Copenhagen in the middle of the one of the most significant climate conferences ever held and was displayed as a beacon of change.

A meeting of minds failed to materialise in the main event in Copenhagen, but a COP 15 sideshow displayed how ingenuity and design could present at least one way forward for the shipping industry.

Although considered a research vessel, *Viking Lady* is also a working ship supplying oil platforms in the North Sea; the ship took three days off its normal work schedule to visit Copenhagen and to showcase its design possibilities.

Meeting the needs of an increasingly climate conscious world the supply vessel has many advantages, it operates largely on four 2mW Liquefied Natural Gas (LNG) main engines and, for research purposes has a 320kw fuel cell on deck which is used for auxiliary power providing heat and electrical energy for the crew accommodation block.

The vessel has reduced CO_2 emissions by up to 50%, NOx, SOx and particulate emissions have been totally eradicated and fuel efficiency has been improved by 30% claim the vessel's designers and operators.

In addition the LNG engines give a virtually vibration free ride onboard the vessel so that even when the ship is docking and the engines are run at high power to slow the vessel the vibration levels are remarkably low. This benefits the crew who can rest more easily and are then refreshed for their shifts during work hours.

Viking Lady takes part in a helicopter exercise in the North Sea.

"Our staff are fighting to get onboard this ship," said Jan Frederik Meling, CEO of the vessel's owner Eidesvik. He is proud of *Viking Lady* and its achievements so far and he believes that the ship represents a solution to emission controls for some vessel types, including those that are heavy energy users in port, such as cruise ships.

In maintaining a fuel cell onboard a working ship the operator, Eidesvik, said that it will see if the fuel cell, which has an operational life of around 40,000 hours onshore, can be maintained at sea.

"If we can prove this works, and I think we will, the first application will be in offshore vessel engines," explained Mr Meling a founder member of the Fellowship which devised the building of *Viking Lady*.

The Fellowship consists of three Scandinavian partners, Eidesvik the ship operator, Wärtsilä the engine maker and Det Norske Veritas (DNV) the class society and is backed by the Norwegian Research Council. All three companies came together in the early part of the decade with a view to producing a commercially viable ultra low emission vessel.

It soon became clear to the Fellowship that the way forward was to use fuel cell technology and for this purpose the members co-opted the German fuel cell producer MTU into their fold.

Fuel Cell technology is tried and tested on land. It produces electrical energy through a chemical reaction that emits water as exhaust. To start the fuel cell currently on *Viking Lady* hydrogen was used, but once operational LNG is its fuel.

Heating up to a maximum temperature of 650°C the fuel cell can take a few days to reach maximum power and up to two weeks to cool down, but DNV COO Tor Svensson insists there are no safety issues with the system: "We have developed new rules that ensure fuel cells are safely installed on ships".

TECHNICAL PARTICULARS

Viking Lady

Delivery:	2009
Length:	92.2m
Width:	21m
Depth:	7.6m
Gross tonnage:	6100tonnes
Dead weight:	5900tonnes
Berths:	25 persons
Class:	DNV 1A1, Supply Vessel

One issue with *Viking Lady* was that the ventilation was not considered sufficient when the fuel cell was first loaded onto the vessel in August 2009 and this meant here was a delay in starting the cell which was eventually operational from 3 December.

Further testing onboard the vessel will take place over the course of 2010 and that will conclude the two phase project that the Fellowship set it self to achieve in 2003. The first phase being the US$3.5million (NKr20million) feasibility study and the second phase was the US$16.4million (NKr93.5million) fitting of the fuel cell and then integrating it into the ship's systems.

Once complete the testing will mark the end of the project though all three partners Eidesvik, DNV and Wärtsilä will all consider the project unfinished. Eidesvik is seeking a partner to develop vessels that operate on LNG and Mr Meling believes that offshore supply ships can use the technology efficiently.

Discussions are taking place with possible partners, but Mr Meling said there are two major hurdles: "Firstly there is a need to build a 'marinised' fuel cell at full scale, in order to reduce costs fuel cells will need to be produced in numbers and no-one really knows how long the cells will last at sea."

There is a third hurdle and that is convincing potential owners and operators that the fuel cell technology operating alongside LNG fuelled engines is a financially viable option.

According to the Fellowship the capital costs of a fuel cell/LNG powered vessel are 10% higher than a conventional vessel, that means that charter rates for the ships will be higher, but operational costs are significantly lower and that lowers the overall costs over an extended period.

According to Mr Meling: "the operators say that they are paying €3500/day less in fuel costs and they are saving on NOx taxes too".

Ingve Sørfonn, director of energy management at Wärtsilä Ship Power, said Wärtsilä is also looking to learn from its experience with *Viking Lady*. "We've already met expectations [with *Viking lady*], we have a stable system we have met efficiency goals and tested environmental issues such as vibrations."

The system now needs scaling up and that needs funding or "a shipowner to establish a market for the vessel" said Mr Sørfonn.

The fuel cell being lifted into place in August 2009.

Operating in the North Sea with the West Phoenix oil platform in the background.

However, technologically there is another requirement and that is that the fuel cell system needs to grow in scale. Mr Svensson said: "We need to get more power out of a unit that is around the same size [in dimensions] as the one installed on *Viking Lady*."

Currently the cell on the Eidesvik ship generates around 320kW of power the Fellowship partners believe that three times that power can be produced by a fuel cell of a similar size and that would make it commercially viable.

According to Mr Meling he would ideally like to produce a vessel with two 1mw fuel cells and three 2mW LNG engines offering the same power overall as *Viking Lady* and with an increase in the price of conventional bunker fuel and the introduction of pollution penalties such as the NOx tax that is already payable in Norway the ships would certainly be viable. ***NA***

Hydrocomp adapts propeller design

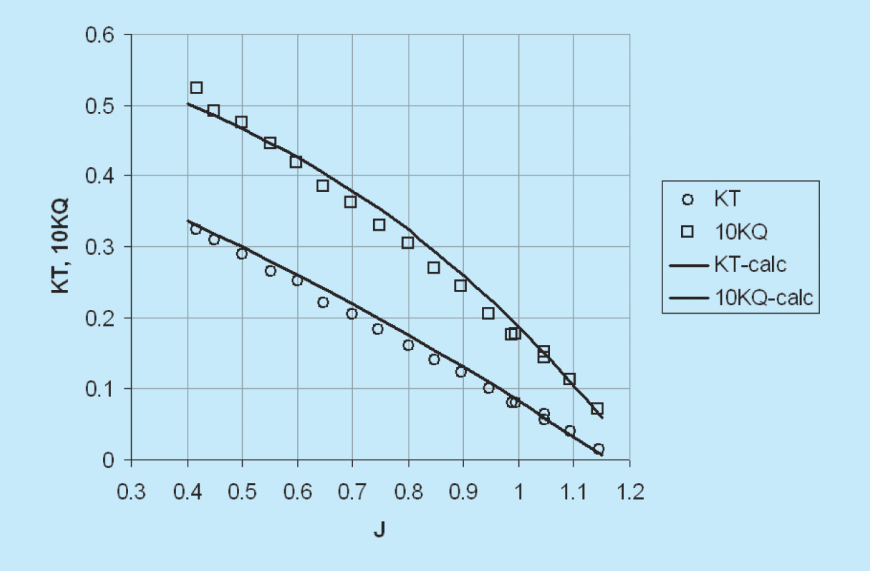
Hydrocomp's two-year R&D effort to develop a Propeller Design and Analysis (PDA) module, that it says will offer a cost-effective alternative to complex codes for wake adapted propeller design and performance prediction, is in its final stages.

The development objectives specified by Hydrocomp for the PDA module were reliability, usability, behaviour, and cost-effectiveness with specific technical goals including well-behaved predictions with no unusual results, and that special knowledge of propeller modelling is unnecessary.

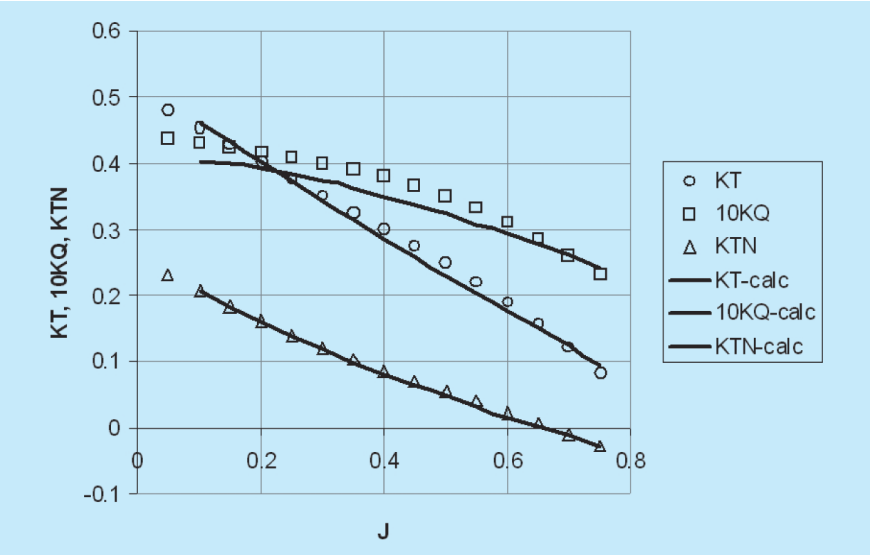
A technical feature of the software is that the model will utilise a "vortex lattice lifting-line" calculation engine with special proprietary enhancements. Users will be able to select from a list of foil types (such as NACA 66 mod, segmental, and bi-circular) to more accurately predict performance, especially in the off-design analysis of KT-KQ curves. Propeller configurations include both open and ducted propellers, with work continuing on counter-rotating and tandem propellers.

The PDA module is hosted by HydroComp's NavCad resistant and propulsion software. Data exchange is available to the PropCad propeller geometric modelling software, and will be extended to third-party CAD and analysis codes.

Ducted propeller performance is defined by selection of a nozzle type (eg, 19A, 37, 33), and representative performance coefficients are employed for prediction of nozzle thrust contribution, inflow velocity, and tip-gap.



Open propeller performance (DTRC 4119).



Ducted propeller performance (Kaplan 4.55 in 19A nozzle).

Added extras

Adding to the 2009 versions of NavCad and PropCad HydroComp has added extra features to both.

NavCad now features a new reporter viewer that will provide enhanced reporting options, including export to PDF, CSV and RTF. Along with Propeller CAD shape to generate and export representative propeller CAD shape in Initial Graphics Exchange Specification (IGES) format at the proper diameter and number of blades. Measures of propulsion merit will have propulsion criteria that have been added for industry-standard measures of merit, including "transport effectiveness". Calculation updates that will include Froude friction line, additional cavitation parameters and nozzle performance coefficients, new file and print functions, and enhanced support for heavy-loaded propellers.

PropCad's latest features include a new report viewer the same as NavCad, along with conic flow geometry, which will allow the user to design propellers to a conic flow orientation as well as circular flow. Feature updates include China Classification Society (CCS) class thickness report, new file and print functions and modified 2D drawing attributes. *NA*

Mastership moves Dutch designs forward

Rotterdam-based Groenendijk & Soetermeer, consulting engineers and naval architects purchased Mastership's CAD software in August last year so that it could offer further design options to its customers.

The main activity of Groenendijk & Soetermeer is the design and engineering of seagoing ships and inland waterway vessels such as chemical and gas tankers, container ships, coasters, passenger vessels and ferries.

Until its recent purchase of Mastership, Groenendijk & Soetermeer has been using design software AutoCAD LT. "Although AutoCAD LT has its limitations, its possibilities were sufficient for our needs. However, over time we realised that we could better suit the needs of our clients by offering more than design drawings alone," said Robert Gerritsen, Groenendijk & Soetermeer.

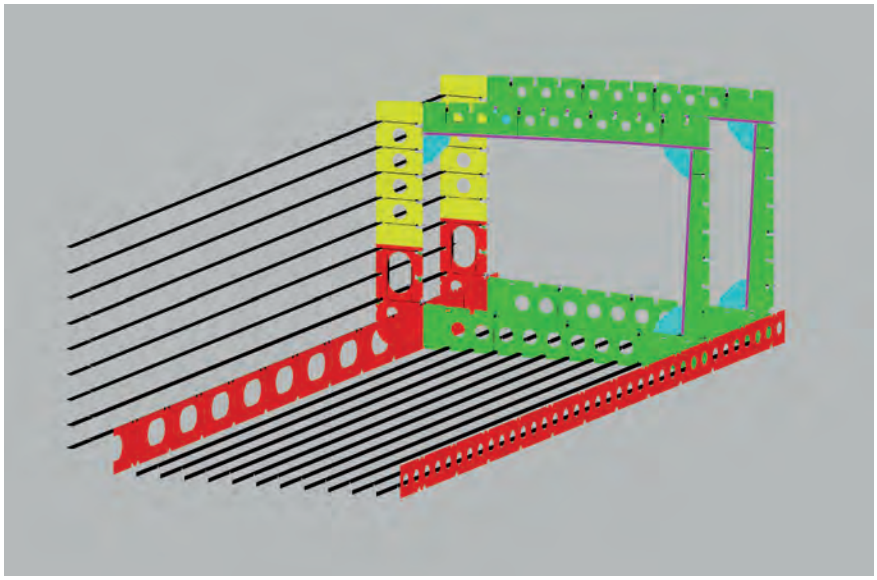
Along with the 2D drawing's that it provides to its customers, Groenendijk & Soetermeer also aim to supply workshop drawings and cutting codes, etc. to be able to have better control over each stage of a project, from early design to fabrication at the yard.

"We made an inventory of different design programmes that were able to suit our needs.

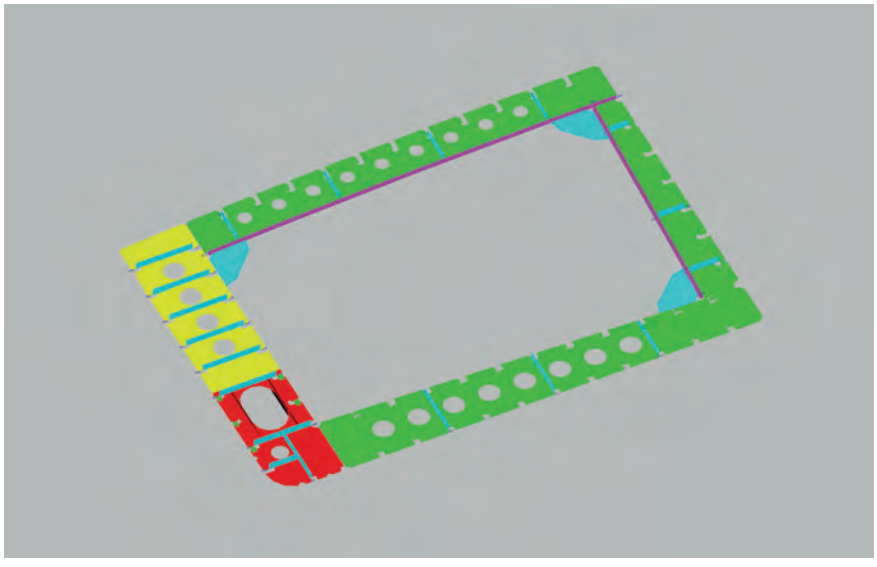
A key feature we wanted to be incorporated in the new software was specific shipbuilding functionality. Most 3D design programmes are generic programmes, and for us this would have no advantages over AutoCAD. Another feature was compatibility with AutoCAD, to be able to work on old projects, and have a shorter learning curve and, therefore, maintain productivity while switching to the new software. The specific shipbuilding functionalities of the software should help us save time during a project," added Mr Gerritsen.

After assessing and considering all options from other design systems Groenendijk & Soetermeer chose Mastership based on price, specific shipbuilding features and the compatibility with AutoCAD it said.

Mr Gerritsen commented on the improvements that Mastership will be able to offer: "Because we are a relatively small design company we don't have the manpower to make all the workshop drawings and cutting codes for large ships. So another great



Part of the assembly of the mid-shipsection from a type 'C' inland waterways chemical tanker.



Render of the parts of a Webframe from the type 'C' chemical tanker.

TECHNICAL PARTICULARS

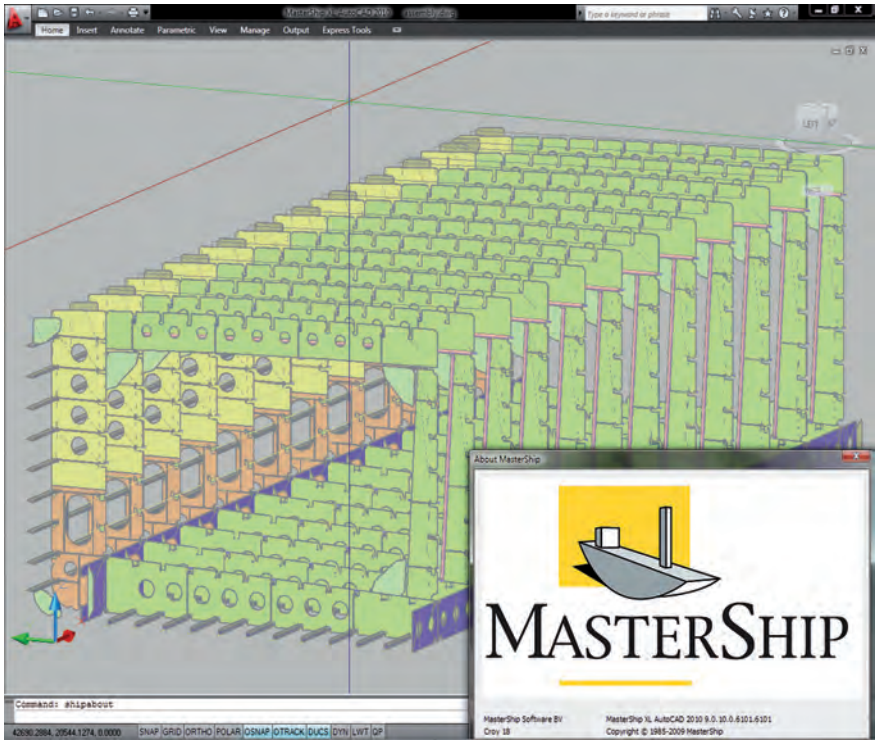
Type 'C' Chemical tanker

Length	135m
Breadth	14,20m
Depth	4,80m
Draught	3,90m
Cargo tanks	14
Cargo capacity	5155m³
Engines	2x1600kW
Service speed	25km/h
Class notation	Lloyd's Register A1, 1WW tanker type 'C', ADNR
Steelweight	casco±1150tonnes

advantage from MasterShip is the engineering services they provide. Therefore, it's possible for us to outsource parts of a project to MasterShip. Because MasterShip is also a Dutch company, it is easy to communicate with them."

With specific shipbuilding features in Mastership Groenendijk & Soetermeer has said that Mastership will help it to design faster and more consistently. Future projects that Groenendijk & Soetermeer has planned using Mastership are for an 135m inland waterways chemical tanker, dry-docks, coasters and a survey vessel.

The chemical tanker will be 135m in length and 14,20m in breadth and will have a depth of 4,80m. As yet the yard is still in negotiations with Groenendijk & Soetermeer about this vessel. *NA*



View of the MasterShip XL working environment in AutoCAD 2010.

Passion for Innovation enhances CATIA system.

Dassault Systèmes' Passion for Innovation programme and CD-adapco's Computational Fluid Dynamics (CFD) software are helping to turn the Kalmar propulsion system from concept in to reality.

The Dassault Passion for Innovation programme was launched in 2005 and was based on the principle that, as is often the case, outstanding ideas fail through the lack of resources. The programme set out its mission to help individuals and not-for-profit organisations bring their innovative ideas to life using Dassault Systèmes' 3D software solutions.

Michal Latacz a mechanical engineer from Krakow, Poland was chosen to enter Dassault's Passion for Innovation programme after showing the first prototype of his Kalmar project at the Brussels Eureka exhibition in 2007, where it won the gold medal and distinction prize.

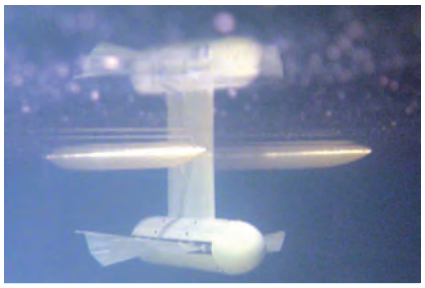
"The design was really innovative, very interesting and an eco design with silent output. We saw the design at the Eureka exhibition and it won the gold medal prize," says Richard Breitner, Passion for Innovation program manager, Dassault Systèmes.

He adds: "We saw that this project could be re-optimised from our point of view and end up with a product that might be able to be industrialised, but mainly we wanted to support Michal to help him take his invention further."

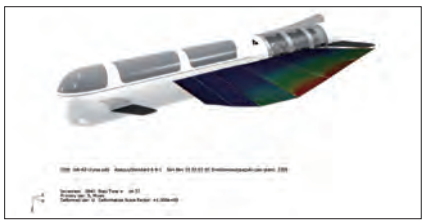
Mr Latacz started designing Kalmar when he was still a student and took his inspiration from nature, in particular from cephalopods and rays to design a revolutionary vessel propulsion system.

"Ever since I remember I found nature to be a fascinating thing. I can observe it and still it can astonish me. I am qualified as a mechanical engineer and when I approached the Kalmar project I wanted to develop something from nature and using my mechanical knowledge." Mr Latacz says.

Mr Latacz initially designed Kalmar using CATIA V5, Dassault Systèmes' design software, as he says that it was the most intuitive and quickest virtual software. The construction of the first prototype saw Mr Latacz experimenting with further



Kalmar in water trials.



Propulsor internal stress simulation using SIMULIA.

prototypes and also with the idea of a wave propeller. After running 10 simulations of Kalmar he took it to the towing tank to be tested, "it worked first time!" exclaimed Mr Latacz.

Since joining The Passion for Innovation run by Dassault Systèmes' Mr Latacz has been able to make further studies of the Kalmar project. In testing Kalmar has shown good efficiency and a good maximum speed, it has a high drive efficiency potential, when tested as a 1m prototype to other boats on the market. Mr Latacz has also remarked that the wave propulsion unit is more efficient than normal propellers. Kalmar has also looked at the efficiency of running on an electric engine.

Looking forward Mr Latacz is hoping to develop the design for the commercial market and can see potential for the design in the area of inland river vessels and leisure transport and also unmanned craft. He says that the design of the wave propulsor would be harmless to water animals and would suit medium to low speed engines, and would be free of cavitation up to 3-4hertz. He has noted though that the system would lose efficiency should it go any faster.

Building on the success of the Passion for Innovation project, Mr Latacz is also working on a project called Stingray, in which he has used CD-adapco's STAR-CCM+ simulation tool to analyse different innovative propulsion systems.

The Stingray is a concept vessel that will "fly" underwater, controlled by active ballast water chambers and rudder system in an easy and intuitive manner using a joystick. "I sincerely believe that this energy efficient concept has enormous commercial potential," said Mr Latacz. "So far the major focus of the Stingray project has been centred on developing the control system, but we have also clocked up many simulation hours analysing pump and propeller propulsion systems."

"We are delighted to be able to support this project," said David Vaughn, CD-adapco's VP of marketing." As a company our principle objectives are increased innovation, through providing a constant stream of engineering data to guide the design process, and cost reduction, by reducing the need for expensive physical prototypes. The Stingray is a great example of a truly innovative project that would not have been possible without in depth engineering simulation."

"Using STAR-CCM+ I have been able to optimise the flow around the vessel, paying particular interest to interactions between the free surface and the hull," said Mr Latacz. "I have also been able to couple flow solutions from STAR-CCM+ with membrane stress and deformation calculations from SIMULIA."

By using CATIA and SIMULIA and STAR-CCM+ Mr Latacz's innovative Kalmar prototype has been able to take further steps forward and now is ready and waiting for further investment. *NA*

Friendship's simulation-driven upgrades

Friendship Systems has announced that it has released its latest upgrade Friendship framework 2.1 that will bring additional functions to the user.

The developments to the system have been made in distributing computing (allowing multiple computers to be connected to the same system), data handling and tool configuration. The distributing computing includes idle hardware in the computation of intensive calculations and will, therefore, reduce development time for the user. Distributed or remote computing will be able to accelerate long and intensive tasks such as simulation and optimisation.

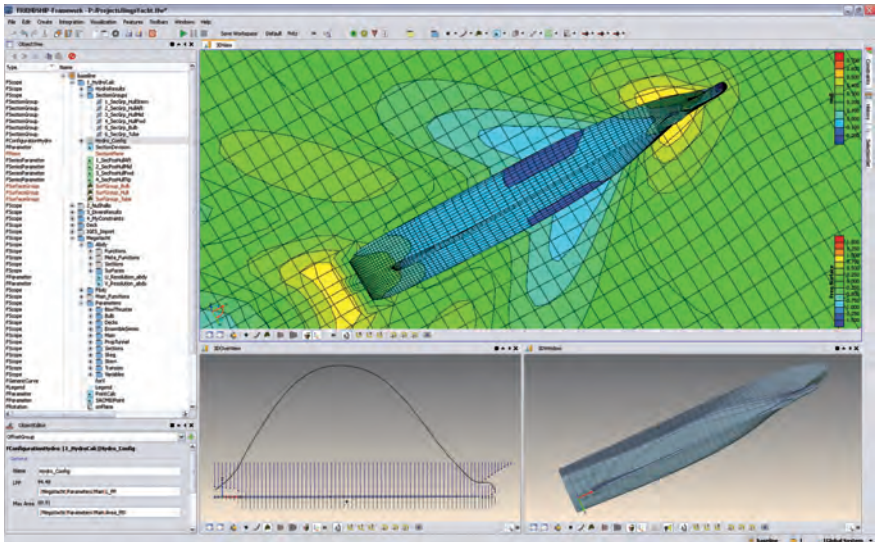
Other developments include; further enhanced data management to ensure faster file handling and will relieve the designer of ballast workload, say Friendship Systems.

Automatic back-ups and added crash recovery, which will retrieve an open project to its latest state in case of a system failure, raise convenience and speed up saving procedures.

Friendship-Framework 2.1 supports better memory consumption, runtime, project loading, reduced idle time and consolidation of the design process. User-friendly refinement in the handling of points and curves will facilitate interactive geometric modelling.

Driven by the needs of the customers who work project-based and who integrate external tools into their design process, special solutions were developed for the configuration of the integration platform and new ways to purchase the software. The friendship-Framework integrates flow simulation and geometric modelling and serves as a platform for external programmes. The configuration wizard supports the set up of input data for external tools. It also allows the user to customise the software system to their individual preferences.

The Friendship-framework can now be issued as floating licences and be rented. Floating licences are a flexible solution and cost saving alternative for mobile and group work, said Friendship Systems. *NA*



The CAE software FRIENDSHIP-Framework allows the comprehensive assessment of mega yacht designs and other geometries.

ShipConstructor responds to enterprise clients

The latest release of ShipConstructor 2009, a 3D CAD/CAM software toolset for the shipbuilding and offshore industries, is specifically targeted for use on large-scale projects.

The latest version includes numerous enhancements designed to increase efficiency for the user when working with complex 3D product models as well as features aimed at reducing costs.

Darren Larkins, deputy CEO, ShipConstructor Software Inc. (SSI) said: "By listening specifically to the challenges faced by our enterprise clients and reacting accordingly, SSI has introduced a series of enhancements that bring this philosophy to the most complex projects."

64-bit Support

In a move intended to satisfy key customers such as Brazil's Estaleiro Atlântico Sul (EAS), SSI has introduced 64-bit capability to its entire product line on the Microsoft Windows Vista and Windows 7 platforms. As a result it is expected that EAS will see tangible benefits on the 14 Suezmax, seven Aframax and one P55 semi-submersible platform that the yard is currently building say SSI.

This added capability of the software will allow modellers to load larger portions of the 3D model into a single working session at a greater level of detail and with increased programme stability. The volume of reference information which, will be available when a designer adds to the 3D product model or changes an existing design, can be directly correlated with the number of design errors that are introduced.

Democratising Virtual Reality

Improvements to the creation of Virtual Reality (VR) models will mean designers will be able to create a detailed VR model from the 3D product model. Numerous custom visualisation options, which control the overall creation process are available with the software and can be set depending on the intended use of the VR model from the customer. Due to the ease with which these VR models can be created, complete with attribute data from the product model, designers using ShipConstructor now have a tool that will allow them a greater understanding of the overall design say SSI.

Improved Material Utilisation

Material costs are one of the most significant costs in shipbuilding and offshore projects. Great care is taken to ensure that the nesting process, in a shipyard is as efficient as possible to maximise utilisation of the available raw plate. ShipConstructor has improved its automated nesting software capabilities with the introduction of an enhanced nest optimisation engine. The software is available at no extra cost to ShipConstructor clients, test results have shown that clients can expect to see up to a 6% improvement in overall plate utilisation. When taken over the quantity of material used on a typical commercial vessel, this represents a significant and ongoing savings.

Intelligent Distributed System Supports

In an effort to improve ShipConstructor's capabilities in the area of pipe and heating, ventilation and air-conditioning (HVAC) supports, SSI collaborated with Northrop Grumman Shipbuilding (Avondale & Pascagoula), Bollinger Shipyards, Marinette Marine, VT Halter Marine and Genoa Design International as part of a US National Shipbuilding Research Project.

The resulting Distributed Systems Supports module is a rule-based programme for the creation of distributed system supports. In line with SSI's other efforts around Design for Production (DFP), the software allows an experienced designer to inject knowledge based rules into the library of supports which are available during the 3D modelling process.

This enhanced module offers parametric design based on a broad range of industry standard supports. Each support is associated with a set of pipes and pipe hangers as well as foundational structure, allowing the support to be constrained by, and automatically adapt to, design changes as the project progresses.

Effective Design Reuse

Another DFP-based enhancement was a set of functionality allowing for the standardisation of commonly used assemblies, including items such as simple panels, ladders, equipment complete with standard foundations, pipe manifolds, and handrails etc.

In addition to allowing these common items to be modelled once and used many times, these Standard Assemblies include the production documentation required for fabrication. These production documents include 3D Assembly drawings for each stage in the fabrication of the assembly. When changes are made to the Standard Assembly definition or the related construction documents, all instances where it has been used are automatically changed as well.

Space Allocations

One of the most significant challenges encountered during the detailed design process of a complex ship or offshore structure, is in determining and reserving space for the various systems (pipe, HVAC, electrical, etc…). The ability to reserve this space early in the design will improve the overall efficiency of the design process.

This latest version of ShipConstructor will provide an intuitive set of tools that allows for the allocation of space for the required systems well before they are modelled. The allocated space is parametrically associated with the wireways in the upcoming ShipConstructor Electrical module. Changes to the allocated space will be automatically propagated to the detailed electrical system model, providing a bridge between the earlier stages of the design process and the final production design. *NA*

Recession holds an icy blast for Norway in 2011

Norwegian shipyards and owners are under no illusions, they know the recession will impact them further, the question now is how will the industry look when the upturn finally comes?

Two thousand and nine was a fairly good year for Norwegian shipyards despite the economic impact, in so much as the shipyards still have vessels to build. With previously agreed orders either being cancelled or delayed and virtually no new orders coming through this year, the impact of this failure to win new business will not be seen until 2011.

"It's a dire situation for Norway. The orderbook in 2010 will be more or less drained and at the moment we see no activity for 2011," says Tore Forsmo, director - Maritime Competence and Recruiting, The Norwegian Shipowners Association.

The market trend for vessel construction has seen highlighted activity in the offshore support and specialist vessels sector. However, it is expected that the offshore sector will also feel the bite in 2010 because of the financial situation across the whole industry.

"Owners will still need to sustain orders for newbuildings and they will need to be financed. At the moment the Norwegian Kroner is still strong, but it is against a weak US dollar which does not help," adds Mr Forsmo.

In 2009 there was NOK90 billion (US$15.5 billion) worth of vessels delivered from Norwegian shipyards, the number of vessels being delivered in 2010 will only equate to NOK22 billion (US$3.8 billion) with a further huge slump in 2011 of expected deliveries to NOK9 billion (US $1.5 billion).

With the current economic climate we are seeing more ship owners trying to get out of contracts, says Mr Forsmo. The financial crisis has seen more lay-ups mainly in the car carrier sector, but also in the offshore sector, numbers are starting to rise.

"Six per cent of global platform service vessels are in lay-up due to lack of activity from the oil companies. At the moment everyone is playing the waiting game. Even when the oil price does hold a sustainable level the companies will still wait, as they will want to see if there are any further fluctuations in the market." commented Mr Forsmo.

With the economic turnaround being anyone's guess at this current time, The Norwegian Shipowners' Association still believe that there is time in 2010 for shipyards to get orders in. How many orders there will be in 2011 was another question altogether, but one thing is clear - the yards will struggle.

The impact will hit Norwegian workers hard as the shipbuilding industry in Norway is located in small clusters based in rural areas. Mr Forsmo points out that: "What will be the effect to workers and clusters in the regions, should the work start dying out? It is not just the workers, but all the skills that we will lose"

Looking to Asia and how it has been affected by the economic crisis, with Singapore laying off a number of vessels of recent, sends out a stark reality of what is happening in the industry. "Norwegian yards are generally speaking, in a different market than most Asian yards. We are manufacturing high technology, high value, tailor made vessels, mostly for the offshore oil and gas service sector and where clients are mostly Norwegian or Norwegian-

The current economic climate is starting to take its toll on the Norwegian maritime industry.

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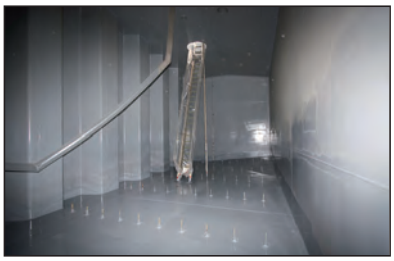

The marine environment has always been a harsh and unforgiving environment for both anti-fouling and corrosion control coatings systems. In the current economic climate the industry faces an even greater need to improve the performance and cost effectiveness of coatings systems. The industry is now being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

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

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

This conference will provide a forum for materials manufactures, shipbuilders, repair yards, contractor's operators and owners, coating manufacturers, and classification societies. Topics include:

- Performance standards for protective coatings
- Oil tank coating standards
- Search for alternative "equivalent" coating systems
- Harmonization of coating system certification
- Maintenance and repair of coating systems
- Coating system development & challenges
- Environmental issues: anti-fouling, solvent emissions, etc.
- Coating measurement, recording and analysis systems
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Norway's newbuilding orderbook looks set to dry up by 2011 if orders do not start coming through soon.

related shipowning companies. Much of the strength of the Asian shipbuilding industry has been in the very efficient and lean production of off-the-shelf type of standard vessels in large production series," commented Mr Forsmo.

Also, further development in 'green' technology bought about by recent stringent regulations on emissions has seen Norway produce a NOx fund for research in to green technologies, helping ship owners bring their vessels in line with the latest 'green' regulations. Although not all would agree that this has had a positive effect on Norway's ship owners.

"The problem with the NOx fund is the way it is enforced. It is enforced in a way that only really applies to Norwegian owners and is arbitrary on how it is enforced against other flag carrying vessels. It's not a level playing field," comments Mr Forsmo.

Norway is aiming to cut it's emissions down to zero in the future and at the time of writing COP15 was still waiting in the wings. Mr Forsmo adds: "On the issue of greenhouse gases there is no international legislation in place yet; that's for COP15 in Copenhagen and hopefully International Maritime Organization (IMO) to decide. That being said, Norwegian ship owners have always been in the forefront in developing and implementing environmental maritime standards. The Norwegian Shipowners' Association has a very ambitious environmental vision, i.e. zero harmful emissions from future vessels to water or air, which will be in our mindset in all our environmental activities.

He continues: "When international environmental legislation is concerned, yes it may mean more business for some manufacturers of specific equipment but for the shipowning community the main concern is that new legislation is globally implemented uniformly across the board so that we don't create a competitive imbalance in the markets." *NA*

Norway looks to a greener future

The Norwegian NOx fund is based on an agreement between 14 companies to reduce NOx emissions in Norway by 20% over four years.

The nitrogen oxide (NOx) fund has been set up to be an instrument and document for the government to gauge the reduction of emissions over the four years during which it will run. The NOx fund started on 14 May 2008 with 14 cooperating business organisations joining and also co-founding the Fund.

Geir Høybye, The Business Sector's NOx-fund manager, NHO-Confederation of Norwegian Enterprise, says that Norway had trouble reaching the NOx target when it was originally set out. Norway's NOx emissions were, at the time 20% higher than the target set by the Gothenburg Protocol. Originally, Norway's own NOx tax system, that came into effect in 2007, required companies to pay a price of NOK15 (€2) per kilo of NOx.

The NOx fund is set to reduce Norway's NOx emissions by 30,000tonnes over the next four years, through the agreement with the 14 companies and will offer support for those who sign up to the agreement. The NOx fund offered companies who signed-up to it before end of 2008 90% support, in financing green solutions onboard vessels, this support is set to reduce to 75% later this year.

Geir Høybye pointed out: "Shipping is an important area. The emissions are high and little has been done. Very little has been done in areas of technology, which is a bit immature." He adds: "Kits that could rebuild motors then could reduce NOx by 30%, but there was no real demand for kits and no incentive."

With technology now starting to develop for a greener shipping industry the NOx fund is currently linked with 400 projects three quarters of which are onboard vessels, with the rest on land based facilities.

With commercial vessels starting to explore other fuel alternatives such as gas and LNG, ship owners and builders are now starting to approach the fund. A feature in Norway at current is the broad gas development, creating a dramatic shift that has seen more companies working together to develop new technologies in this area.

Not only in the area of gas, but also catalytic cleaning has been the biggest single way of dealing with NOx so far. H+H Umwelt has said that it has 146 catayic installations, 110 of these have been in Norway. In total of projects being run under the NOx fund there are 25% engine rebuild projects, 30% Selective Catalytic Reduction (SCR), 20% gas projects

and just over 1% on development of Exhaust Gas Recirculation (EGR) technology.

The NOx fund is a four year agreement that is due to end in 2011, but there are hopes that the fund will continue after 2011. The fund will learn, before 1 May 2010 whether it will continue, from the Norwegian government. "Fourteen organisations have written to the government for the fund to continue," comments Mr Høybye. "The chances are pretty good for it to continue. The new agreement will have to go to Brussels to be agreed, but it [the fund] has teeth," he adds. If, however, the fund does not succeed in getting an extension it is expected that the original NOx tax implemented by the Norwegian government will come back into effect and at a higher level than €2 per kilo of NOx.

Technical developments

Sea-Cargo will be delivering four ro-ro vessels in 2010 and 2011, which has had support from the NOx scheme, with engines being delivered from Rolls-Royce. Two (hull numbers 357 and 358) of the four ro-ro's will have 2nd generation Rolls-Royce engines installed onboard, running on liquefied natural gas (LNG). Reductions of greenhouse gas emissions (GHG's) are expected to see a 90% reduction in NOx, 20-23% reduction in CO_2 and 100% reduction in SOx and particulates.

The ro-ro's have been ordered from Indian shipyard Bharati, with delivery of the engines expected next year, where they will be shipped from Rolls-Royce, in Bergen, to India to be installed on the vessels. The vessels will be 132.8m long and will have a deadweight of 5600tonnes and a draught of 6m. The vessels will have 1150 lanemetres for cars and will be fitted with a 50tonne container crane.

A special feature of the ro-ro's is the single engine room layout. Normally a system like the one that Rolls-Royce has designed would require separate engine rooms, but due to running on a single engine, the system also utilises double-piped supple fuel, "meaning that if the system has a leak it can be detected and also controlled due to the outer pipe in place," comments Kjell Harloff, vice president offshore engines, Rolls-Royce.

Cold liquid gas will be stored in two insulated LNG tanks each 240m³ forward of the engine room, in a ventilated enclosure offset to one side to clear a vehicle ramp and minimising the impact on cargo capacity. The gas engine turns the propeller through a reduction gear and also supplies the vessels electrical load by means of a generator driven off the gearbox.

Norway looks to cut emissions by 20%, by 2011.

SeaCargo's LNG powered ro-ro's are to be launched in 2011.

Rolls-Royce has also entered into a cooperation agreement with Hamworthy for the design and adaptation of fuel tanks to fit into other vessels, with further negotiations on other projects also looking at gas systems. Mr Harloff gave a prediction of when we will start seeing these vessels being constructed: "We are working on several projects at the moment that will materialise in the coming months."

In regards to the future of the NOx fund and whether we will see it continue past 2011, Mr Harloff added: "I think so, I think it will apply in some form. Probably the budget will increase and with political involvement, but it will carry on." *NA*

Polarkonsult adds to its PK 100 range

Polarkonsult is expanding its range with its PK-156 heavy-lift vessel.

Polarkonsult has announced its latest ice class design the PK-156 an ice strengthened multi purpose ship designed for extreme heavy-lift operations, as well as general cargo transportation.

The ship is fitted with retractable thrusters aft and tunnel thrusters forward for DP2 operations. The super heavy-lift design offers a total loading capacity of 2 x 1000tonnes and has been designed for 'open-hatch' operation.

Sigmund Sørensen highlights the ship's characteristics: "The vessel features big cranes with extra lift capacity; also, it has Ice Class and can work at DP2."

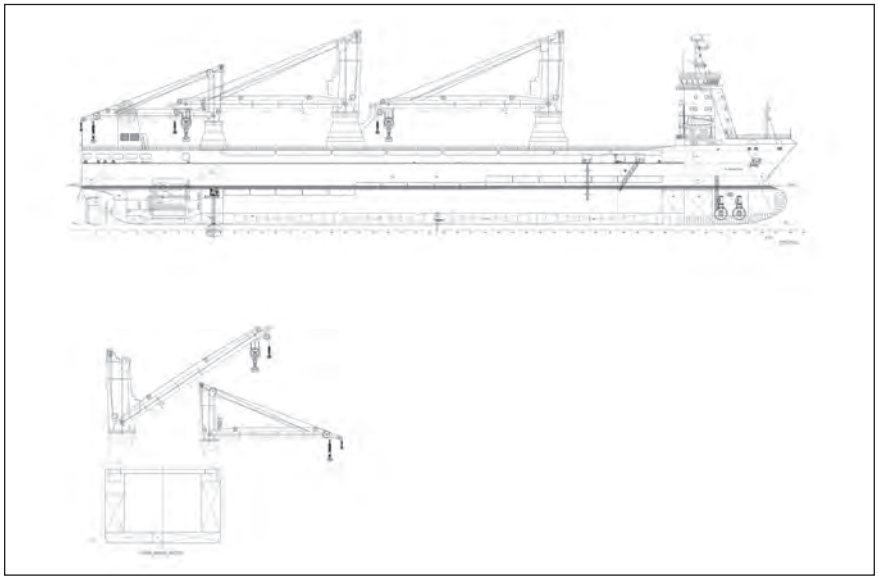
The PK-156 design was developed in 2008 and has been offered to the market earlier in 2009. To date discussions are under way with ship owners interested in the design.

Mr Sørensen points out: "That the market is not so hot and that orders are taking time to come through", even so Mr Sørensen feels confident that there will be orders for the PK-156 design. "At this time most of the market is suffering, but vessels ordered today will not be in the market before 2012," he adds. *NA*

TECHNICAL PARTICULARS

PK-156 heavy-lift vessel

Length o,a	168,40m
Breadth mld	27,00m
Depth to1.deck	14.30m
Draught	9,00m
Deadweight	16,000tonnes
Speed	19knots
Fuel oil, HFO and MDO	1.740m³
Water ballast	16.000m³
One hold, total volume	23.700m³
Heavy-lift cranes, main	2x1.000tonnes
Crane, stern	250tonnes
Main engine, 2 stroke	14.000kW
Retractable thruster aft	1x1.500kW
Tunnel thrusters fwd	2x2.000kW
Accomodation	26 persons
Class authorites	Ice1A✠- DynPos AUTR (DP2)-clean



GA Plan of PK-156 heavy-lift vessel.

The latest Ice Class heavy-lift design from PolarKonsult.

Norwegian coast guard gets gas powered

Roll-Royce has announced its latest involvement with a series of Norwegian coast guard vessels that has hybrid machinery allowing the ships to run on either diesel fuel or LNG, giving maximum flexibility and reduced exhaust emissions.

The electrical power system contract was originally awarded to Scandinavian Electric. During the build process Scandinavian electric became part of Rolls-Royce, with the main diesel engine, the propulsion system, deck machinery and controls in which it was to supply.

KV Barentshav is the first to go into service, to be followed by *KV Bergen* and *KV Sortland*. The building contract went to Myklebust Verft, part of Kleven Maritime group, based on hull steelwork fabricated in Romania. *KV Barentshav* is based in the northern part of Norway and its duties include; Exclusive Economic Zone (EEZ) protection with fisheries control, emergency towing, search and rescue, and pollution prevention. Given these diverse duties, the vessel has a propulsion system that is efficient under widely varying conditions of load and speed.

The latest coast guard trio follow offshore vessel design to a large extent, in view of the towing requirement. They are 93m long, 16.6m beam, and classed with DNV. An unusual hybrid machinery system has been adopted, with liquefied natural gas (LNG) and diesel oil as alternative fuels and both mechanical and electrical transmissions. The single 4m diameter controllable pitch (CP) main propeller can be mechanically coupled to the Bergen 32:40 L8P diesel engine, which is rated at 4000kW, and/or to a 2500kW electric motor feeding power into the reduction gearbox.

The motor is supplied by a selection of gensets, powered by Mitsubishi high speed gas engines in a separate engine room. LNG is bunkered into a single 234m^3 insulated flask and the liquid is warmed to low pressure gas before being fed to the engines. The main engine can also generate electricity by means of a shaft generator driven from a gearbox on the front end of the Bergen engine, the same gearbox driving the pump for the vessel's FiFi1 fire-fighting system.

A flap rudder provides steering, assisted for manoeuvring and dynamic positioning by 735kW tunnel thrusters fore and aft, and an 883kW vertically retractable azimuth bow thruster, all from Rolls-Royce. On trials, *KV Barentshav* achieved a bollard pull of just over 100tonnes. On the mechanical drive, the vessel will reach speeds up to 18knots, while 20knots is obtainable with the electrical addition. On gas power alone the ship can sail at up to 15.5knots.

In keeping with a long standing arrangement, the three Norwegian coast guard vessels are privately owned, by Remøy Management. The vessels are on 15 year charters to Kystvakt. *KV Barentshav* has accommodation for up to 40 persons and an 18-person crew. ***NA***

STX delivers *Stolt Groenland*

STX Norway has announced the delivery of the parcel tanker *Stolt Groenland* to owner Stolt Tankers BV.

Stolt Groenland is the fifth vessel in a series of six advanced parcel tankers to be delivered to Stolt Tankers BV. The vessel will join the other four vessels that have entered service from Stolt-Nielsen's hub in Rotterdam and will service the rest of the world.

The fore and aft sections of the vessel were built at Wadan Yards Okean. The mid section, with stainless steel tanks, was constructed in Florø, Norway. The sections were joined together in Florø, where also the final outfitting and commissioning of the ship was done. *Stolt Groenland* has a length of 182m, a breadth of 32.2m with a depth of 15.6m, and a deadweight of 43,500dwt.

The vessels are double-hulled and meet both Marpol Annex I and Annex II cargo requirements and are International Maritime Organization (IMO) ship type I, II and III capabilities. The vessels are also equipped with 24 stainless steel tanks and 15 coated tanks and are capable of transporting a range of difficult-to-handle cargoes.

Stolt Tankers says that all vessels ordered will be delivered. Jacob Stolt-Nielsen, Chairman, Stolt-Nielsen S.A., said: "…Stolt is unique in that the focus of our business is on long-term contracts, not the spot market. About 70% of Stolt Tankers' business is, in fact, contract based. Granted, this strategic focus prevents us from fully benefiting from high spot-market prices at the top of the cycle. But we have always held that the trade-off is more than justified by the downside protection afforded at the bottom of the cycle, as well as the benefits of the close working relationships we enjoy with our contract customers."

To date four vessels *Stolt Sagaland*, *Stolt Sneland*, *Stolt Island* and *Stolt Norland* have been delivered to Stolt tankers BV; with the last of the vessels, hull number 154, scheduled to be delivered in March 2010. ***NA***

TECHNICAL PARTICULARS

CSBC 40,000dwt oil tanker

Length o,a 182.00m
Length b,p 174.00m
Breadth (moulded) 32.20m
Depth (moulded) 17.30m
Design draft (moulded) 11.00m
Deadweight at design draft 40,000dwt
Cargo hold volume
(incl. slop tank) 46,000m³
Tonnage 27,500gt
Service speed (NOR with 15% S.M)
at design draft 14.60knots
Class ..... BV, I ✠Hull ✠Mach Oil Tanker CSR CPS(WBT) ESP ✠ AUT-UMS VCS Unrestricted navigation CARGOCONTROL MON-SHAFT INWATERSURVEY CLEANSHIP 7+
Main engine ..... 1 set 6RT-Flex50-B
MCR ..... 9960kW x 124rpm
NOR ..... 8964kW x 119.7rpm
Power equipment ..... 4 sets x 720kW diesel generator, 1 set emergency generator
Tank capacity
Heavy fuel oil ..... abt. 1400m³
Marine diesel oil ..... abt. 150m³
Fresh water ..... abt. 300m³
Ballast water ..... abt. 18,300m³
Cargo oil system ..... 3 cargo oil pumps, vertical electric motor driven with convertot centrifugal, each capacity about 1000m³/hr x 125m T.H.
Stripping system ..... 1 cargo oil stripping pump, vertical electric motor driven twin screw type, capacity about 100m3/hr x 125m T.H. 1 stripping eductor for tank cleaning, capacity about 150m3.hr.
Ballast system ..... 2 main lines branch system
Ballast pump: 750m³ /hr x 20m TH x 2 sets
Windlass and mooring winch ..... Electro-hydraulic driven without auto-tension device.
Windlass ..... 2 x 26/20tonne x 9/15m/min
Mooring winch .... 5 x 15tonne x 15m/min
Complement ..... 30 persons

Hamworthy to supply to Taiwanese oil tankers

Hamworthy has announced that it is to supply all-electric cargo pump room systems for two 40,000dwt crude oil tankers being constructed at China Shipbuilding Corporation, Taiwan (CSBC, Taiwan) for domestic Taiwanese customer China Petrochemical Corp.

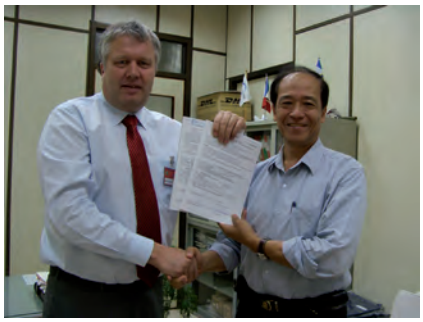
The first of the two 40,000dwt oil tankers is due for delivery from China Shipbuilding Corp, Taiwan in mid-2011 with the second vessel to be delivered at the end of 2011. The vessels will be constructed to Bureau Veritas class, and will be the first tankers from the Taiwanese yard in 20 years. The vessel will have a length of 182m, a breadth 32.2m and a depth of 17.3m and will have a cargo volume of 46,000m³.

Terje Bjørnemo, Hamworthy global sales director for pump room systems, has said that the selection of low harmonic variable speed drives came after the owner and the yard concluded that the solution was more energy efficient and more dependable than traditional steam turbines that include outdated steam driven piston pumps. The decision was taken in consultation with Taipei-based United Ship Design and Development Centre.

The order was made in October 2009 with the complete pump room systems installations delivered by Hamworthy Pte Ltd, Singapore and installed onboard the vessel in time for the delivery of the vessels in 2011.

"The equipment will all be controlled and monitored by a Hamworthy Cargo Control System (HCCS), a state of the art PLC-based control system where all signals are electric rather than pneumatic," said Mr Bjørnemo. "In agreeing on this modern solution, the owner will benefit from all of the advantages conferred by PLC-based control."

Type HCCS is a modular ship automation system that will control and monitor the complete cargo and ballast handling process, as well as of all of the alarm and shutdown functions for maximum safety. The system is prepared for easy interconnection at various levels with other control systems onboard, forming an integrated total system.



Left to right: Terje Bjornemo, Pump Room Systems sales director and Mr. Bor Liang Lee, deputy director - Material Department, CSBC.

Using frequency converters will mean that the pumps will be able to operate at optimum performance during any unloading conditions, resulting in higher total system efficiency and lower power consumption. When used as a direct drive force, electric motors will also increase system efficiency compared with alternative systems.

Rafal Kroczka, Hamworthy managing director of Hamworthy Baltic Design Centre (HBDC), said: "A study conducted this year at the HBDC established that steam turbine-driven cargo pumps create almost three times the CO_2 emissions and double the fuel consumption when compared to electrically-driven systems during offloading operations."

Mr. Bjørnemo added: "The benefits of this technology also include improved life-cycle costs, reduced noise emissions, lower maintenance, reduced installation and commissioning costs, greater operational flexibility, and safer operation." *NA*

Climate contradiction not a problem for class

According to the US Geological survey some 25% of all untapped oil reserves fall within the Arctic Circle. Three major class societies are looking to capitalise on moves by oil companies to exploit reserves in 'more challenging' regions, including the Arctic.

Talk of climate change has reached a climax as the Copenhagen summit reached its conclusion in mid-December, not least among those espousing the need for greener ships are the three major class societies, ABS, Lloyd's Register and Det Norske Veritas (DNV).

Yet all three are engaged in work that will take advantage of the melting ice in the Arctic caused by man-made global warming through the over-use of fossil fuels, in the main oil. Undeterred by this fact the major class societies are all looking to help exploit oil and gas reserves in the region that will undoubtedly cause even more pollution and speed up the process of climate change.

Classification societies cannot shoulder the blame for catastrophic climate change, but they remain a key element in the drive to exploit Arctic oil. Humanity's insatiable appetite for oil is driving that move into the hitherto inaccessible regions. In the changing Arctic landscape,` which alters the economics of drilling and extracting oil from such regions, there is an industry developing that will help mankind exploit these mineral reserves.

> "There is not enough alternative energy sources to meet the world's needs so this oil is still needed, even if we reduce the amount we use"

Jörg Beiler DNV vice president and regional manager for greater China told a gathering of journalists at the Marintec Exhibition in Shanghai last month that: "There is not enough alternative energy sources to meet the world's needs so this oil is still needed, even if we reduce the amount we use". He conceded that "not drilling [in the Arctic] would be the perfect situation, but we are looking to exploit the oil in the most environmentally friendly way".

Roger Basu, the director of research and development for ABS based in Houston, Texas, also understands the contradiction of drilling for the very oil that has been the main cause of global warming in a region of the planet that is currently seeing the greatest changes as a result of the emissions from that oil.

He was, however, more circumspect: "It is too controversial a subject for me to comment on", he said. Even so, ABS has established a Harsh Environment Center (HEC) in association with the Memorial University in Newfoundland to help its clients to exploit natural resources in extreme conditions.

Lloyd's Register did not comment on the issue. *NA*

ABS and DNV opt for ice class

Even as the mean temperatures of the globe rise the technological challenges posed in exploiting the minerals in the Arctic and other sub-zero regions will see new technology designed to allow industry to exploit these newly available reserves.

Two major class societies, Det Norske Veritas (DNV) and ABS, have forged links with universities in a move that is seen as significant in the efforts to exploit oil and gas reserves in more challenging environments, mainly the Arctic region.

DNV has established links with a university, the Shanghai Maritime University (SMU), hoping to benefit from its research and development facilities as well as cooperating on training and scholarships.

The Norwegian company's research already shows, however, that the effects of climate change means there is less ice allowing for wider ranging areas to work in and prolonging the seasons that operations can be maintained as well as allowing for new shipping routes to open.

DNV's regional manager for Greater China, Jörg Beiler, said: "I believe the establishment of a strategic partnership between us [DNV and SMU] will help both parties expand and deepen their established cooperation".

Undoubtedly ABS made similar assessments when forging links with Newfoundland's Memorial University to create the Harsh Environment Center. However, Roger Basu, the director of research and development for ABS based in Houston, Texas, explained that while the oil and gas business has the biggest potential in the region, it is by no means the only mineral available there and the HEC will not only be looking at shipping in support of the oil and gas industries but will look at all types of shipping.

"Alaska has large zinc deposits," points out Mr Basu, "and the Baffin Island Project is looking at a mining project for iron ore on the coast of Labrador".

Jörg Beiler DNV's regional manager for greater China down at the docks.

Baffin Island ore carriers would present significant challenges for naval architects as the ships would have to be ice strengthened in order to negotiate very heavy ice in the Newfoundland and Labrador region explained Mr Basu. And, as the main market for the ore would be Europe, the vessels would then have to negotiate the very heavy seas experienced in the North Atlantic. "It will be a challenging project," admits Mr Basu.

Meeting these challenges is not beyond the means of a class society such as ABS and as Mr Basu points out it is useful to have access to experimental facilities of the kind available to the class society at Memorial University.

The company currently has one member of staff based at Memorial, but ABS said: "We are looking for the centre to grow organically". That means more staff could be added within a year, depending on what research projects

are funded. Funding will in itself depend on the clientele and what needs they identify for research purposes.

Money could also be an issue although Mr Basu stresses the total investment will be "substantial", but he explained that the total funding made by ABS is still under discussion. "There are things going on that pre-date the centre, so do we roll those costs into the budget? Those discussions are still ongoing," he said.

Initially research funding will be used to look at the oil shipping and support industry and, in turn, that is driven by the unified Polar Rules outlined by the International Association of Classification Societies (IACS). Class societies recognise that these rules have "gaps", said ABS, that need to be filled.

"IACS realises that the Polar Rules need to be refined," explained Mr Basu. He said that there are elements such as the plating thickness and frame measurements and elements of the machinery sections that need to be looked at to make certain they meet modern day requirements.

DNV said the implementation of final Unified Requirements for Polar Ships represents a big step ahead in the harmonisation of rules for ice strengthened vessels designed for Arctic operations.

Originally the work began with new rules adopted by Swedish and Finnish authorities as changes occurred in the nature of Baltic shipping. Regional regulations were based on comparatively small vessels, but as aframaxes and larger ships started to trade in the Baltic more appropriate regulations were necessary.

Mr Basu pointed to particular difficulties as examples, including the regulations for brackets between stiffeners and primary frames were inconsistent with the construction processes of larger ships.

In addition there needs to be a winterisation process for Arctic drill ships that will be exposed to very low temperatures that takes into consideration the grades of steel used in the construction of the vessels, safety equipment including lifeboats and fire extinguishers that need protecting, pipe lagging or heat tracing of pipes as well as human factors such as clothing and dealing with hypothermia.

ABS director of research and development Roger Basu.

ABS will work with partners such as the Canadian Government research group the Institute of Ocean Technology and the National Research Council to develop systems for emergency evacuation and rescue in Arctic temperatures.

> "class societies recognise that these rules have "gaps", said ABS, that need to be filled."

"We will work on joint development projects with shipyards, consultants and Memorial University where we can," said Mr Basu.

Partners are also being sought for research into how liquefied natural gas (LNG) carriers behave in ice. According to ABS little is known about how the various LNG containment systems might behave, for example following a collision with an iceberg. "Is there a danger that the containment system would be breached?" asked Mr Basu.

He said that ABS has spoken to and is in discussions with Gaztransport & Technigaz (GTT) manufacturers of the MKIII and the No96 LNG membrane containment systems for LNG ships and there is "potential for a project in this field," concluded Mr Basu.

GTT's membrane systems are a part of the ship with the membrane attached to the hull, whereas other containment systems like the Moss Spheres could be a different proposition altogether.

Polar exploration and mineral exploitation clearly has some obvious difficulties that must be overcome. Global warming could, however, be bringing new dangers to those that are considering working in these extremes. As the ice breaks up massive icebergs are formed that could pose a serious threat to shipping in the region.

"As glaciers heat up they are shedding ice bergs more frequently into the regional seas," said Mr Basu. One such area that could be affected is a region between the coast of Newfoundland in eastern Canada and the west coast of Greenland known as "iceberg alley". According to Mr Basu prevailing currents would send ice north off the coast of Greenland and then carry them south off the coast of Canada. "It was probably one of these icebergs that was responsible for the *Titanic*" he said.

Avoiding another *Titanic*, or indeed another *Exxon Valdez*, or any other disaster, is essential. The first line of defence in protecting human and animal life and the environment must be better knowledge that would lead to better design. Research is, therefore, a key tool in the battle to make shipping greener and cleaner.

If the links forged by these two major class societies with the HEC and SMU manages to meet at least some of these requirements it will have been a worthwhile investment.

As to the wisdom of exploring new territories for new sources of a fuel that has already caused significant environmental damage, history will be mankind's judge. ***NA***

Ice experts plan for Arctic oil exploration

Lloyd's Register is currently involved in developing new technological approaches aimed at enhancing the performance of ice capable ships. By Robert Hindley, surveyor, Lloyd's Register Asia.

With the most significant developments for Arctic shipping in the near future likely to be associated with specific projects, including oil and gas exploration, shuttle tanker operations from high Arctic offshore oil fields and high-grade ore shipments from remote Arctic mines, many of the design projects are being tailored to the shipping requirements and the environmental conditions of the operational area.

In addition to this project-specific work however, the class society is also undertaking more general work in support of assessing strengthening requirements for ships operating in Arctic waters.

Regarding the project-specific work, Lloyd's Register Asia has recently undertaken a number of pilot applications using an operational scenario-based design approach in order to refine procedures for design review, based on real projects.

These pilot applications and an overview of the approach of assessing ice strengthening using operational scenarios was presented at the International Conference of Port and Ocean Engineering under Arctic Conditions (POAC) in Luleå, Sweden in June 2009.

For such bespoke designs, classification society ice class rules are typically the foundation on which a design may be based. However, consideration of the specific operational and environmental characteristics of the project will then be added, often with the final design differing greatly from a standard 'rule based' ship.

However, ice class rule sets that are based on different operational and simplified design assumptions may not provide the level of confidence to the operator needed for the specific tasks that the ship must undertake.

To ensure a safe level of design is reached for such Arctic projects, the class society is developing an approach of using an operational scenario based design review. This involves ensuring that, through a hazard identification and risk mitigation process, the design requirements for the ship are derived from an operational envelope definition, with input from the designer, prospective operator and other key stakeholders on exactly how the ship will be operated in defined ice conditions.

As Arctic shipping development continues, Lloyd's Register Asia sees an operational scenario based approach to both design and design review as an effective way of providing confidence in new ships operating in the Arctic, beyond the scope of application of prescriptive ice class rules.

However, one of the main issues holding back research into ship strengthening is a lack of comprehensive ship-ice-load data, correlated to recorded ice conditions. At present, the collection of such data can require the installation of equipment such as strain gauges on the ships' hulls – all of which can be very expensive.

> "However, the maritime industry has largely overlooked a rich source of information – what happens when ice loads on a ship's hull exceed the ship's design limits."

Moreover, most dedicated ice trials, where the ice conditions can be practically determined, currently require ships involved to be withdrawn from commercial service while they carry out the research work. And in conducting such research, it is often difficult to find the right ice conditions in which to test, adding to the ship's down-time, and further pushing up the costs involved.

Until now, in the few instances were hull monitoring has been deployed on ships in trade, it has been difficult to fully assess the ice conditions in which the ship was operating.

However, the maritime industry has largely overlooked a rich source of information – what happens when ice loads on a ship's hull exceed the ship's design limits. Because ice loads that exceed a ship's design point can be evaluated by a review of the damage caused, such reviews, when compared to full-scale measurements, provide valuable insights into the response of structure to ice, and at a comparatively low cost. Also, every ship operating in ice can potentially provide the measurements the industry needs.

Using recorded damage evidence to improve the industry's understanding of the loads ships experience when operating in ice is not in itself new. In 1968, an analysis of damaged ships operating in the Baltic was used to refine the ice-class rules of the Finnish and Swedish maritime administrations.

In the paper that Lloyd's Register Asia presented in September 2009, in association with Aker Arctic Technology at the RINA ICSOT 2009: Ice Classed Vessel conference in Busan, South Korea, the authors use analytical methods and practical approaches to determine the ice pressures related to the damage incurred by ships in commercial operation. The results are compared with the ships' design and a number of strengthening levels associated with current ice-class rule requirements.

Preliminary results of the study indicate that there is scope for reducing the strengthening levels in some areas of the hull for specific ship types, reducing the steel weight, while maintaining a safe level of strengthening. However, there also appears to be a need to re-address the way in which some ice-class requirements - notably in terms of ice-strengthening extents - are defined. *NA*

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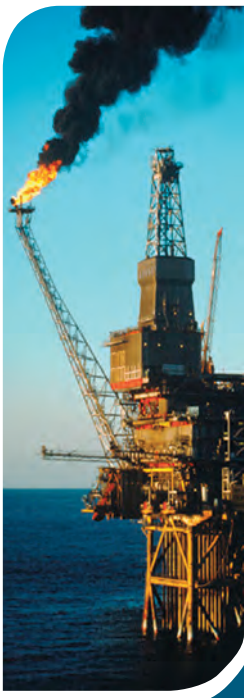

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