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

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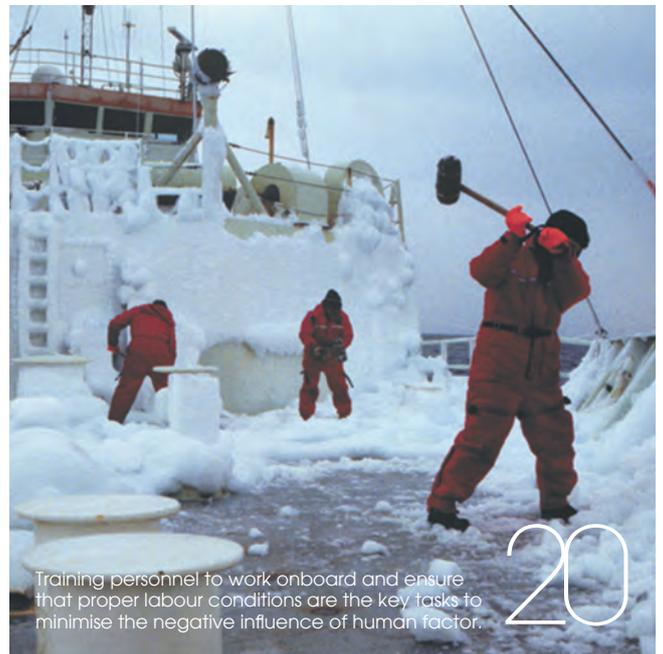
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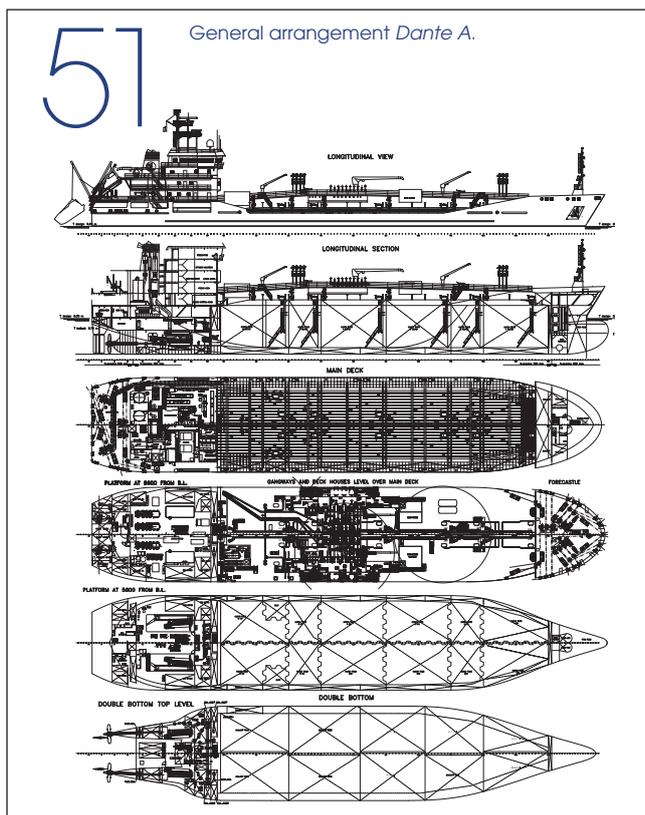
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Rendering of the new fleet tanker due to be delivered to the Indian Navy by Fincantieri.



Image of *Edda Accommodation*, due to be handed over in the first quarter of 2010.



General arrangement *Dante A.*

On-line Edition

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





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Action at last on recycling

Ship breaking on the shore. Will this fit in with the IMO's new Ship Recycling Convention?

The issue of ship recycling has finally made tangible progress at the International Maritime Organization's Marine Environment Protection Committee (MEPC).

With work being led by the Japanese delegation, October's MEPC approved the final draft of the Convention on Safe and Environmentally Sound Recycling of Ships, to be considered for final approval in May next year at the Diplomatic Conference in Hong Kong.

The new convention will provide regulations for the design, construction, operation and preparation for recycling of ships so as to facilitate safe and environmentally sound recycling.

While an intervention by Greenpeace indicated that certain elements of the environmental lobby remain dissatisfied with the terms of reference agreed for the framework of the coming convention, others present were more concerned with developing a workable convention in the context of global shipping.

In the wake of the meeting, Germanischer Lloyd held its first 'class exchange' forum, and topping the agenda was the question "How can shipowners and yards prepare for the new requirements?"

With 60 representatives of the shipyards, owners, and supply industry in attendance, Henning Gramann, Environmental Engineer and expert for Ship Recycling at Germanischer Lloyd (GL), gave an overview on the regulations and timings of the convention.

Every new ship would have to enter service with a certified Inventory of Hazardous Material. "This has to be updated through a ship's life time", explained Mr Gramann. "Existing ships

"When an owner decides to scrap a vessel, a facility approved in line with the requirements of the convention has to be chosen"

would also be provided with such an inventory within the first five years the convention enters into force - or before the vessel is sent for demolition, whatever comes first." Recycling Facilities would need to comply with safety and environmental requirements to gain their authorisation and e.g. handle and dispose of hazardous material safely.

Ship Recycling States will be required to take effective measures to ensure that Ship Recycling Facilities under their jurisdiction comply with the convention. "When an owner decides to scrap a vessel, a facility approved in line with the requirements of the convention has

to be chosen. The combination of the abilities of and methods applied at this facility and the ship characteristics like size and hazardous materials contained, will be considered for preparation of the specific Ship Recycling Plan by the ship recycler. This plan has to be approved by the Recycling State and is required for issuance of the International Ready for Recycling Certificate by the Flag State", he added. "This means ships will have to undergo an initial survey to verify the inventory of hazardous materials at the beginning of their operational life, or in-between for existing ships, re-surveys during the life of the ship, and a final survey directly prior to recycling."

An appendix to the convention will provide one list of hazardous materials whose installation or use in ships is prohibited or restricted and another one containing those hazardous materials which have to be documented.

In order to assist shipyards and shipowners in the implementation of the new convention a series of guidelines are being developed. The entry into force criteria for the convention (number of states required and percentage of gross merchant shipping tonnage plus consideration of ship recycling capacity) will be decided by the Diplomatic Conference when formally adopting the proposed convention and starting the ratification process.

If the convention enters into force in 2013 as expected, around 50,000 ships will fall under the new regulation. *NA*

Environment

EC to act against UK

The European Commission plans to take the United Kingdom to the European Court of Justice over what it claims has been a failure to respect EU legislation on ship-source pollution and on penalties for those responsible for polluting discharges. It said it would also send a reasoned opinion to the UK authorities for incorrectly transposing into national law legislation on the European vessel traffic monitoring system.

“The United Kingdom has failed to notify its national measures fully transposing Directive 2005/35/EC,” the Commission said. This piece of legislation aims at ensuring that all persons responsible for polluting discharges at sea are subject to adequate penalties. “These penalties should be effective and dissuasive and may be of criminal or administrative nature. Their application to any person found responsible for an infringement is expected to enhance the protection of the marine environment from pollution by ships and to improve maritime safety.”

Member States should have transposed the Directive into their national law by 1 April 2007.

“The United Kingdom has also failed to correctly transpose Directive 2002/59/EC on ship monitoring,” the Commission said. This Directive aims at enhancing the safety of maritime traffic by improving the response of authorities to incidents, accidents and potentially dangerous situations at sea and thus contribute to a better prevention and detection of pollution by ships.

According to an EC statement: “The Directive is an essential part of the second maritime package adopted in the wake of the Erika disaster. It should have been transposed by 1 May 2004. The Commission found fault in the UK provisions relating to the exclusion of all fishing vessels and traditional ships from the scope of the Directive.”

Shipbuilding

Conoship allies with Algoship

Conoship International BV, of Groningen, The Netherlands, and Algoship Brokers Ltd together with Smart Engineering and Design Solutions Ltd (SEDS), both of Nassau, Bahamas, have agreed to promote and support shipbuilding in India jointly and elsewhere through an exclusive partnership arrangement.

Algoship Brokers and SEDS are controlled by Antony Prince, who specialises in the design and turnkey delivery of bulk carriers, and has extensive experience in brokerage, yard support, construction



Leo van Ingen, managing director, Conoship International BV, (left) and Antony Prince, president, Algoship Brokers Ltd and SEDS,

supervision and related activities. Algoship Designers Ltd has series-built some 45 vessels and has over 71 on order. Designs include *Fantasy* (1996), *Valiant* (2003) and *Trader* (2003), all of which have featured in RINA's Significant Ships.

Conoship International principally designs short-sea vessels. Its portfolio covers a range from 600dwt to 15,000dwt and its current client order book shows almost 50 vessels under construction in India, The Netherlands, Vietnam, China and elsewhere.

Leo van Ingen, managing director of Conoship International BV, said: “We are experienced in finding flexible yards for our customers in shipbuilding nations...Importantly for our customer base, which expects high quality vessels, we are now able to offer complete support in India and other parts of the world.”

Antony Prince, president of Algoship and SEDS, added: “SEDS, our recently opened new design facility in Kochi, India, has a well-qualified team of almost 100. In addition, we have constructed ships of our highly efficient *Trader* design in India. Six of these vessels have been constructed at Cochin Shipyard for a well-known European owner and were delivered up to four months earlier than the contracted delivery date. A further four were ordered at Hindustan Shipyard, three of which are completed and delivered to Indian buyers. Algoship also has six of its *Inventor* 20,000dwt bulk carrier design under construction at Bharati Shipyard's Dhabol Shipyard. Together with Conoship we are going to extend the story of our success in India for national and international quality owners.”

Having joined forces, Conoship and Algoship, along with SEDS, will act as partners in the design, marketing and construction of any size of multipurpose vessel, bulk carrier, chemical tanker, dredger or engineering vessel.

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The partners have agreed to utilise the services of Germanischer Lloyd in their collaborative endeavours.

Tankers

Ice loads studied

ABS, ConocoPhillips, Sovcomflot, and Samsung Heavy Industries (SHI) are jointly participating in a pioneering study measuring the effect of ice loads on Arctic class shuttle tanker performance.

Owing to the newness of these larger Arctic vessels, even experienced ice navigators can benefit from additional guidance when selecting the desired speed, mode of transit or manoeuvring options when on passage in heavy ice.

The joint project, understood to be the first of its kind, will provide researchers with important data regarding stresses these vessels experience operating in ice-covered waters.

“We have considerable experience measuring ice loads on ice breakers and smaller ships, but the scale effect of large ships operating in heavy ice conditions is not as well defined,” said Aleksandr Iyerusalimskiy, Project Services, ConocoPhillips. “We are excited to be part of a project that can contribute to improving our understanding of the safe operations of vessels in the Arctic.”

The study will be conducted on the 70,000dwt *Shturman Albanov*, the third in a series of Arctic shuttle tankers scheduled for delivery from SHI in February 2009, during its initial two winter seasons operating in the Barents Sea. A state-of-the-art monitoring system will employ fibre-optic sensors within the ice belt at two locations in the bow and stern quarters to measure and record ice pressures and loads, and compute ice-induced responses of the hull structure at highly loaded locations. A bridge display depicting a colour plot of the pressure distribution over each area includes an alarm to alert crews of large impacts.

“The goal is to provide real time feedback to operators, reducing the uncertainty that can exist today, and then use this information to mitigate the risks involved,” said ABS research and development manager, Han Yu. “As vessel requirements change to meet industry needs, research continues to assess the practicality of these new designs in more extreme operating conditions. It is a fundamental element in the cycle of ship design.”

Classification

First VLCC to CSRs

Global tanker shipping has entered a new era of robust vessel construction after Shanghai Waigaoqiao Shipyard (SWS) delivered to Singapore’s Ocean Tankers (Pte) Ltd the first very large crude carrier (VLCC) built



Hua San - the first VLCC built to CSRs and also the biggest vessel by weight ever built in China.

to Common Structural Rules (CSRs).

The 318,000dwt *Hua San*, the first of 11 VLCCs confirmed to Lloyd’s Register class at Shanghai Waigaoqiao, was delivered to the owners in October, five months ahead of schedule, ushering in a CSR era that is committed to increase the durability of hull structures for the modern fleet.

Nick Brown, general manager China for Lloyd’s Register Asia, said: “With a global recession looming and financing harder to find, the industry spotlight rightly has intensified on maintaining the construction of quality ships. The success of this project is the result of our strategy to work with yards and owners who share our vision for quality.”

Hua San is the first of an initial order of six VLCCs ordered by Ocean Tankers at Shanghai Waigaoqiao, four of which were classed to Lloyd’s Register. The expansion-minded tanker operator last year returned to the yard for another order of three VLCCs, with three options, again awarding the class for the confirmed ships to Lloyd’s Register.

Hua San is not only the first VLCC built to CSR, it is also the biggest vessel by weight ever built in China.

“With the growth in demand for crude oil in China showing no sign of abating, it is anticipated that this market will require another 40 to 50 VLCCs in the next five years,” said Chen Minjun, president of Shanghai Waigaoqiao Shipyard.

The basic design for the VLCC was created by Korea Marine Consultants with the detail and production design completed by in-house designers at SWS.

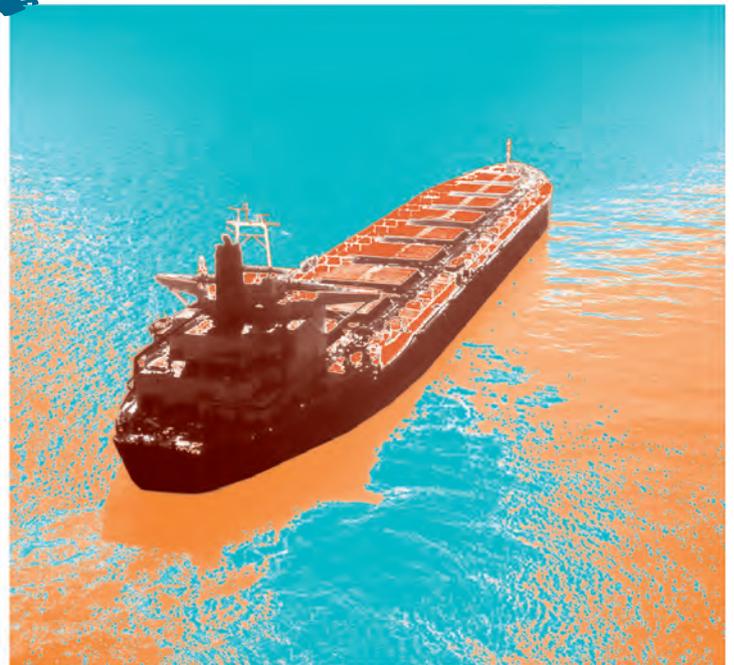
Environment

Heat-shielding paint to save fuel

Mitsui O.S.K. Lines, Ltd has announced test results that it says show heat-shielding paint that can save fuel, reduce CO₂ emissions, and reduce long-term vessel maintenance costs.



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The Technology Research Centre in MOL's Technical Division completed a year long test of heat-shielding paints from 10 manufacturers in August. Along with group company M.O. Engineering Co., Ltd., MOL applied a test coating of the highest-rated paint, Daikin's Zeffle brand, to the deck of the 11,178dwt ferry *Sunflower Gold*, owned by Diamond Ferry and operating between Kobe and Oita. The test confirmed that the paint reduced temperatures inside the ferry and saved electricity by reducing the load on the vessel's air conditioning system.

High vibration is generated and changes its heat energy when sunlight hits a painted surface and infrared rays are absorbed into the coating. Heat-shielding paint uses a special pigment that reflects sunlight, preventing the build-up of heat energy.

The white paint was applied on 800m² of the ship's deck, and compared with surface temperatures of the parts where general-marine paint was used. Researchers then compared the temperature increase/decrease inside the crew quarters of the sister vessel *Sunflower Pearl*, which was coated with general-marine paint.

The increase/decrease of indoor temperature at the peak time of outdoor temperature showed a 5.5degreeC effect in the heat-shielding paint effect simulation. The test showed that the burden on the air conditioning system was reduced by 47.7% more than in an on-land air conditioning system. Even based on this limited application, this would translate into an annual reduction of 8.9tonnes of CO₂ emissions, and a savings of about 2.2tonnes of fuel oil.

The heat-shielding paint also has superior durability against deterioration by sun's ultraviolet rays, thanks to its ultra weatherproof fluorinated formula. Compared to other general-marine paints, the re-painting cycle is 15-20 years.

In future, MOL said it would "take a proactive approach" to using this paint on decks of MOL Group ferries, cruiseships, and car carriers.

Design

Mid-size Caper from FKAB

After several months of negotiations, the Swedish-Chinese ship design company FKAB Marine Design has signed a design contract for four 110 000dwt bulk carriers with Indian shipyard Goodearth Shipbuilding Pvt Ltd. The order, which anticipates a first delivery in 2011, is significant for FKAB, since the ship size is in a growing segment attractive to both ship and cargo owner's worldwide.

The B12 midsize Cape design was developed by FKAB in cooperation with Fearnley's in 2006. The design combines a high carrying capacity of 5 million

ft³ with main particulars adapted to most ports in Europe, India and South America. The design fully complies with the new CSR-rules and all aspects of environmental concern have been taken into account, such as ballast water treatment, coating, emission reduction, location of tanks, etc.

Classification

Yachting with Bureau Veritas

Bureau Veritas has opened a Yacht Technical Office in Genoa to provide a centre of expertise for all issues relating to the construction, classification and statutory certification of mega yachts.

Maxime Pachot, manager of the Yacht Technical Office, said: "The technical issues which face yacht designers, builders and owners are getting more and more specialised. Mega yachts are often at the cutting edge of design, materials use and equipment. Yachts are also subject to a complex regulatory regime which varies considerably with the size of the vessel and its intended use. There is no such thing as a one size fits all rule book for yachts, and a lot of expertise is needed to ascertain which are the right rules and regulations to apply, and how to apply them."

Bulk carriers

Coal handling *Princesse*

A consortium of bulk shipping logistics providers has taken delivery of a new transshipping vessel from Subic Shipyard and Engineering Inc in the Philippines, which will be deployed handling coal exports in Indonesia on behalf of PT Berau Coal.

The specialised, US\$10.5 million, 3500dwt *Princesse Abby* is 60m long, 22.6m wide and has a draught of 5.5m.

Designed by Italian companies Logmarin and Interprogetti and classed by Rina, the vessel features a Liebherr heavy duty crane able to handle 35tonnes at 35m outreach in open water.

The crane is fitted with two 24.5m³ coal grabs supplied by SMAG Peiner enabling 18,000tonnes of coal to be transhipped per day between barges and ocean-going vessels.

Princesse Abby will be deployed off East Kalimantan at Muara Pantai anchorage in the Sulawesi Sea.

"The floating crane is equipped with damping systems for floating crane motions attenuation," said Mario Terenzio, head of Genoa-based Logmarin Advisors. "The four-rope grab configuration ensures high turnover and the crane is designed for continuous heavy duty operation in open water."

Onboard accommodation consists of 24 berths. *Princesse Abby* is owned by PT Mitra Swire CTM, an Indonesian joint venture between PT Mitra Bahtera Segarasejati (MBSS) and Swire CTM Bulk Logistics.

MBSS handled some 20 million tonnes of coal in Indonesia last year with its fleet of 90 sets of tugs and barges ranging from 4,000dwt to 11,000dwt and range of offshore handling facilities.

Jon Vassella, MBSS vice president, said PT Mitra Swire CTM would take delivery of a second transhipment vessel of similar design next year.



The just-delivered *Celebrity Solstice*.

Cruiseships

Carnival goes to town

Fincantieri's Monfalcone yard launched its largest ever passengership in October, in the shape of *Carnival Dream*. To be flagship of Carnival Cruise Line's delivery is scheduled for the Autumn of 2009.

At 130,000gt, the 306m long, 2559 cabins ship will be able to accommodate up to 4631 passengers, assisted by 1369 crew.

Carnival Dream is an evolution of the six vessel-strong *Conquest*-class series design, showing several modifications with respect to the original layout. Significant alterations have been made in the public areas' layouts, in particular on deck 5, which will feature a promenade running around the entire perimeter of the ship. Moreover, numerous restaurants and public areas will overlook the sea.

The ship will also feature two new "Water Parks" located on the open decks, one for adults and one for children, with an innovative four-slide system.

Cruiseships

Solstice rises

Meyer Werft has delivered the 122,000gt cruiseship *Celebrity Solstice* to the cruise company Celebrity Cruises (Miami, USA) in the Dutch port of Eemshaven.

She is the first ship out of a series of five the Papenburg shipyard is building for Celebrity Cruises. Special features of the ship include a total energy saving of 30% compared to previous ships by virtue of highly energy-efficient components such as a photovoltaic system, optimised hydrodynamics, an extremely efficient underwater coating and an energy-saving lighting system using LEDs.

The 317.2m long, 17-deck *Celebrity Solstice* is also the first ship to be built to new rules regarding damaged stability which will be valid as of 2009 and which help to increase safety considerably in case the ship is damaged due to a leak. Roughly 90% of the passenger cabins are outside cabins; most of them having their own balconies.

The ship also features a diesel-electric podded propulsion system, complex alarm and safety systems, and interactive communication systems.



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Propulsion

MAN expands licensee family

MAN Diesel has added another member to its family of two-stroke licensees with the signing of a contract with Zhejiang Yungpu Heavy Machinery Co., Ltd. The new licensee is to establish an engine factory near the major economic hub of Ningbo, Zhejiang Province, due south of Shanghai. The contract was signed at MAN Diesel low-speed headquarters in Copenhagen on 29 September. The new licensee will concentrate on the building of low-speed, two-stroke engines in the 26cm-50cm bore range, aimed primarily at supplying local shipyards.

Contact MAN Diesel, Teglhølmegade 41, DK-2450 Copenhagen SV, Denmark.

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Fax +45-3385 1030

E-mail mandiesel-cph@mandiesel.com

www.mandiesel.com

Propulsion

Yanmar diesels get podded

Yanmar Marine is to offer podded drives to connect to a range of its diesel engines. The lightweight, electric steering ZF Pod 2500 and 2800 have been designed for its engines of 450mhp and below.

A cockpit-mounted, intuitive joystick allows one-handed control of the entire system. For twin installations, each drive moves independently, allowing for better turning efficiency and throttle response. It allows slow speed manoeuvring and docking with similar ease and precision. There are significant improvements in top-end performance, cruising speed and fuel economy, depending on boat and operating conditions.

Draught is reduced, due to installation inside the hull. Hydrodynamic design and the positioning of the

propellers counteract drag to improve performance. Rubber mounts reduce gear noise and vibration, giving a quiet, comfortable ride. Engine exhaust is virtually eliminated by venting through the propeller hubs.

Two sacrificial pieces are incorporated into the system. Both are secured by bolts that will break away in the case of impact, absorbing the energy created and thereby avoiding damage to the hull. Should the podded drive hit underwater debris, the aft-facing propellers are protected by the gear case and skeg. Because the pod is mounted in a tunnel, the torpedo shape of the drive is the same depth as the keel and most floating objects will be deflected downwards and away.

Yanmar has also launched a new six-cylinder 6CX530 electronically-controlled diesel engines. At 855kg, the engine's dry weight is predicted as lightest in its power class, the unit is said to be 200kg lighter than some comparably-size units.

The common rail injection system used has been designed specifically for the 6CX530 by Yanmar's engineering team and the package is completed with a Yanmar-manufactured gearbox.

Power output is 390kW at 2900rpm. The power-to-weight ratio is 0.63mhp per kilo. It has the same dimensions as its predecessor, with height of 933mm, length without gear 1340mm and width 886mm. The latest EPA and RCD emissions regulations are met in full. Yanmar's 6CX530 is available as from the first quarter of 2009.

Contact Yanmar Europe B.V, PO Box 30112, 1303 AC Almere, The Netherlands.

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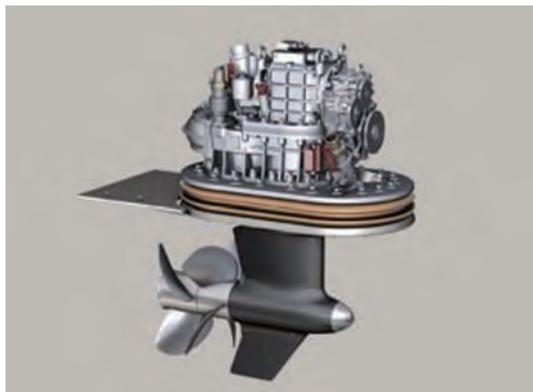
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Propulsion

Wärtsilä saves fuel and cost

Wärtsilä's Low Loss Concept system has been ordered by Canadian shipowner Transport Desgagnés for installation aboard a 95m passenger/vehicle/container vessel, to be built at Croatia's Kraljevica Shipyard. It will be the first ever application of the Low Loss Concept (LLC) in a passenger vessel.

The Low Loss Concept was developed by Wärtsilä to save fuel and installation costs, as well as reducing emissions and the amount of space required for component installation. This concept will also deliver greater redundancy in the electrical propulsion system, and makes commissioning work easier.



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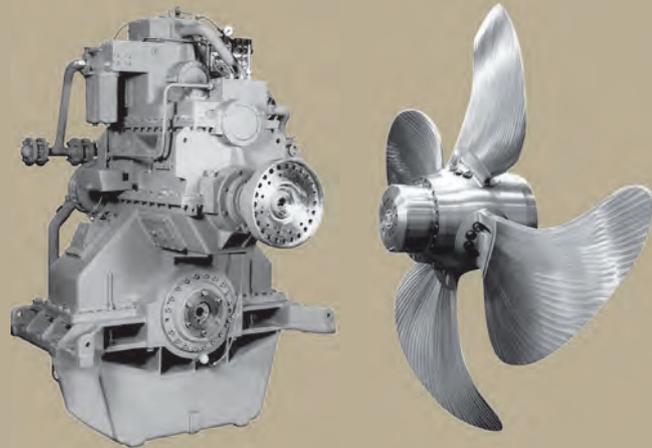
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The decision by Transport Desgagnés to opt for the LLC arrangement was reinforced by consultant Deltamarin Ltd, who found that the LLC was favourable over conventional power distribution solutions due to the high level of energy efficiency and redundancy it affords. The main electrical equipment components are divided into two separate compartments, a requirement deemed imperative to the shipowner's environmental considerations, and one that also increases redundancy.

The 381-passenger, 125TEU-carrying vessel will operate along the ecologically sensitive St Lawrence River, with a weekly itinerary that takes in 22 ports-of-call with short ship stays of no more than five hours.

Contact Wärtsilä Corporation, John Stenbergin ranta 2. P.O. Box 196, FI-00531 Helsinki.

Tel +358 10 709 0000

Fax +358 10 709 5700

www.wartsila.com

Ancillary equipment

Eniram's dynamic trim

Eniram Ltd has announced an agreement with Norwegian Cruise Line (NCL), the cruiseship operator headquartered in Miami, Florida, to deploy Eniram's Dynamic Trimming Assistant (DTA) in the entire NCL fleet of cruise vessels. Resulting from a pilot deployment on *Norwegian Jewel*, the agreement is the largest single deal yet for the Finnish-based Eniram.

Eniram DTA helps vessel officers to optimise trim at all times, minimising water resistance, decreasing fuel consumption, and reducing emissions. The system continuously collects and displays real-time data of vessel attitude, allowing timely action in changing circumstances. The key metrics are brought to vessel officers in an easy-to-read graphic form, to facilitate faster and better informed decision-making.

The full-scale deployment is currently being finalised on the *Norwegian Jewel*. Eniram's delivery model,

designed to ensure the accuracy of the data collected, includes a calibration period during which the dynamic data retrieved from operational vessel management applications and purpose-built sensors is measured for consistency and individually fine tuned for each vessel. Subsequently to *Norwegian Jewel*, Eniram DTA will be rolled out to the entire NCL fleet.

The DTA is based on dynamic data that is automatically retrieved from operational vessel management applications and purpose-built sensors using sensor network technology. The core of the system is its multi-dimensional analysis model, which continuously calculates the key forces affecting the vessel attitude. In fleetwide use, the system can be extended to provide shipping companies with compound vessel performance data for more efficient fleet management.

Contact Eniram Ltd., Itälahdenkatu 22a, 00210 Helsinki, Finland.

Tel +358 (0)20 765 9410

Fax +358 (0)20 765 9420

E-mail info@eniram.fi

www.eniram.fi

Ancillary Equipment

PCTCs to feature ro-ro equipment

Cargotec's business area MacGregor has secured a contract that will see the first pure car/truck carriers fitted with a complete set of electrically-driven ro-ro equipment, totally eliminating the use of hydraulic oil in the operating system. MacGregor has received a contract to deliver totally electrically-driven sets of ro-ro equipment to two pure car/truck carriers (PCTCs).

The contract is with Japanese shipyard Shin Kurushima Dockyard Co Ltd. for two 4000-unit PCTCs: one for Japanese owner MOL and the other for a Korean owner. Each vessel will be equipped with one stern quarter ramp, one side ramp and two internal hoistable ramps, all of which will be operated and secured by means of

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electric winches and actuators. Delivery of all equipment is scheduled for 2010.

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Tel +358-204-554 299

Fax +358-204-554 667

E-mail marketing@macgregor-group.com

www.macgregor-group.com

Ancillary equipment

RWO cleans up with CleanBallast

CleanBallast, recently launched by RWO GmbH, is a chemical free system that is designed to work under high sediment conditions at 400mg/l total suspended solids, usually found in harbours. The system is a modular system, which has been designed to minimise use of space and is easy to integrate. The ectosys disinfection system use electrodes that produce high potential OH-radicals, which have a higher efficiency than that of chlorine.

RWO is expecting sales to double in the next year due to recent IMO environmental regulations, where water treatment systems have to be in place onboard vessels by 2010. As IMO values get tighter RWO is looking to manufacture systems that are chemical free and incorporate the use of membrane separation. RWO has orders for the CleanBallast systems to be installed upon 10 heavy-lift cargo ships for Bremen-based Beluga shipping.

Contact RWO GmbH, Thalendorststrasse 15 A, 28307 Bremen, Germany.

Tel +49 421 53705 - 0

Fax +49 421 53705 - 440

E-mail rwo@veoliawater.com

www.rwo.de

Ancillary equipment

Ballast water treatment for BW

Wilhelmsen Ships Equipment (WSE) will be doing a test installation of the Unitor Ballast Water Treatment system (UBWT) on the clean energy carrier BW Gas *Berge Danuta* with Wilhelmsen Maritime Services providing project engineering and installation of the system. Testing has already been carried out on *Toronto*, which has received basic approval. *Toronto* is a car carrier vessel owned by Wilhelmsen Lines Car Carriers Ltd, with a capacity to carry 6500 cars. The testing on *Toronto* started in July this year and is due to be completed by November. Further testing on *Berge Danuta* is planned to be carried out by February 2009, when tests for final approval will be done.

The Ballast Water system is designed to fit *Berge Danuta* 800m³/hr ballast pump capacity. *Berge Danuta* transports petroleum gases, propane, butane and ammonia, and will be retrofitted whilst sailing so not to hold up time in port. DNV will be checking through drawings before the retrofit of as *Berge Danuta* is carried out.

The ballast water system is based on ultrasonic cavitation, which is supported by electro-chlorination and ozonation. This process allows for the system to be efficient in both seawater and freshwater and to work in highly polluted waters as well.

Contact Wilh. Wilhelmsen ASA, Strandveien 20, NO-1366 Lysaker, P.O.Box 33, NO-1324 Lysaker, Norway.

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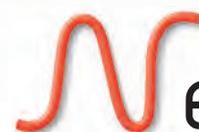
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Cold logic on ice

Growing gas shipments by sea from the Arctic demand ships and crews capable of safe, year-round operations. Accordingly, the Russian Maritime Register of Shipping is developing new rules on LNG carrier construction, and new research on 'the human factor'.

Creation of a new-generation fleet requires considerable technological and organisational innovation. A lot of enterprises of various industries are involved in the design and construction of a modern ship: shipbuilding itself, the metals industry, the heavy machinery sector, instrument engineering, radio-location and telecommunications, alongside many others.

In March, 2008 the Government of the Russian Federation approved a Federal target programme "Development of Civil Shipping for 2009-2016", aimed at providing Russian shipbuilders with a framework to develop new projects and technologies.

The Russian Federation possesses approximately one third of the world's natural gas reserves and is one of the major natural gas suppliers to the world market. The recent trend toward growth of energy consumption has resulted in increasing demand for gas deliveries. The gas extracted in Russia is currently, largely delivered to national and

foreign customers through trunk pipelines, but the expansion of gas extraction areas and the relocation of extraction centres to regions where trunk pipeline infrastructure is not available, and the intention for sales market diversification have caused authorities to focus on the alternative way of gas transportation – carriage by sea as liquefied gas.

Ships intended for liquefied natural gas (LNG) transportation from the Arctic regions must be able to sustain regular, year-round operation. Large LNG carriers are among the most high-tech of ships. Additional challenges during the design of Arctic LNG carriers are connected to extreme low temperatures and ice impact.

Taking into account the increasing volume of the gas transported from the Arctic, the Presidium of the Russian Maritime Register of Shipping (RS) Scientific and Technical Council decided to develop of new rules for ships, carrying LNG. In collaboration with Krylov

Research Institute RS is carrying out research aimed at creation of scientifically based standards and methods for the regulation of operational and emergency ice strength of large Arctic gas carriers. The results of the research completed allow RS to perform design appraisals of gas carriers with regard to the ice and emergency hull strength.

Under a bilateral cooperation agreement between IACS member-societies, RS and ABS are jointly developing Rules for the classification of the Arctic LNG carriers.

RS has an extensive track record in the development of requirements ensuring safe operation of icebreakers and ice ships. The RS Rules requirements for structural strength of ice strengthening are based on physically grounded criteria and assessment methods for structural strength of ice strengthening. Analysing the operational data, data on Arctic ships' damages, statistical data on ice thickness and strength parameters, RS said it was continuously improving its rules, using the latest scientific developments and technologies.

During ship operation in severe conditions it is very important to prevent icing, and to avoid the icing of ship structures and equipment. Already, requirements for polar class ships have been developed, and requirements for ships' equipment to comply with the distinguishing mark 'ANTI-ICE' in the class notation. The mark is assigned to ships wherein both their construction and equipment prevent icing.

The target programme developed by RS to support Russian designers, shipbuilders and shipowners aims at providing high safety standards at sea and protection of the environment. Research conducted through a formal safety assessment has concluded that, as well as the development of additional requirements covering ship structure, measures aimed at minimising the impact of 'the human factor' are required.

Training personnel to work onboard and ensure that proper labour conditions are the key tasks to minimise the negative influence of the human factor.





Regular, year-round operations in ice conditions can have a detrimental effect on ships' equipment.

Ship maintenance and operation are performed by people who unfortunately make mistakes. This is the human factor - the negative influence of which all members of the maritime industry are striving to minimise.

Planning and safety management would be impossible without due regard for the human factor and without monitoring the activities of the individuals. The RS researches, carried out in cooperation with leading scientific organisations, are based upon 'the indirect method' of considering the human factor used by shipping companies. Here, consideration is given to the influence of external factors while work is being performed or decisions are being taken, in order to pinpoint what could be the 'maximum impact' of these factors in any accident investigation.

RS, in cooperation with a number of Russian scientific organisations, has performed quantitative research on the influence of the human factor on the safety of navigation and on methods of how to improve the safety management system (SMS) for shipping companies. RS specialists have developed and introduced a procedure for the self-assessment of the efficiency of the SMS implementation by a company.

Training personnel to work onboard and ensure that proper labour conditions are the key tasks to minimise the negative influence of human factor. RS said that its specialists were actively involved in the development of training courses, lecturing at maritime academies and in refresher courses. **NA**



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Icebreakers built in Russia

The new generation of diesel and nuclear powered icebreakers is emerging.

The technical project for a 60MW icebreaker, to be built in Russia, is to be ready in 2009, and the vessel is to be built by 2015. The 60MW nuclear powered icebreaker is to have a length of 160m, breadth of 32m and two operating draughts 10.5m and 8.5m for the shallow northern river estuaries, and an open water speed of 21knots. It will have a crew of 110 people. The icebreaking capability is 2.9m of solid level ice.

The principal designer of the vessel is Central Design Bureau JSC Iceberg, St. Petersburg, which is owned by UIC.

“Construction must start in 2010,” Sergei Kiriyyenko, head of Rosatom, told reporters in June.

Participating in the development programme is the Central Marine Research & Design Institute (CNIIMF), while the Krylov Shipbuilding Research Institute is participating in design and testing. Finnish-based Aker Arctic Technology has performed a series of model tests in its ice basin with two alternative designs for the new icebreaker project, backing up initial ice model tests done by Krylov Shipbuilding Research Institute.

Before 2020 there are (or were, before the currently growing economic recession) plans to build two more universal nuclear powered icebreakers and one lead icebreaker with the power

of 110MW. Back in 2007, Rosmorrechflot said that a programme to build, before 2020, a fleet of one 110MW icebreaker, seven diesel-electric icebreakers, four auxiliary and port icebreakers and three universal 60MW icebreakers would, in all, cost some RUB97 billion.

The new diesel-electric icebreakers, type ЛК-25, are planned with two aft propellers on each side and one azimuthing thruster located at the centreline, drafted with propellers contra-rotating in each end of the propeller hub. They will command 30MW of power, and feature a length of 120m, breadth of some 27m, design draught 8.0m (max. 8.6m) and icebreaking capability 2.2m.

Other projects presented included a 10MW 70m x 17m x 6.5m icebreaker tug, type ЛК-6, and a smaller tug, type ЛК-5.

Russia's icebreaking fleet today consists of some 38 ships, including seven nuclear powered vessels in service. Most of the biggest nuclear powered vessels are soon to be decommissioned, as some of the reactors have faced problems sooner than planned. According to the Russian Academy of Sciences, the originally envisaged lifetime for the reactors was 50,000 to 60,000 hours, or 20 to 25 years, while the lifetime for hull was 100,000 hours. Rosatom is to replace reactors and prolong the life time where it is appropriate. By 2013 *Taymyr* and *Vaigach*

are planned to be decommissioned, leaving only icebreakers *Yamal* and *50 Years of Victory* in the fleet. “Unless urgent measures are taken, the country will end up with only one such vessel, the *50 Let Pobedy (50 Years of Victory)*, by 2019,” Sergei Kiriyyenko, head of Rosatom said recently.

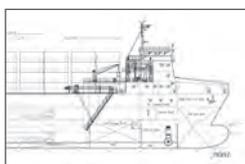
In August, the management of Russia's nuclear powered icebreakers and nuclear maintenance vessels was transferred from Murmansk Shipping Company to Atomflot FSUE of the State Corporation Rosatom. SC Rosatom is acting on behalf of the state in the development of the nuclear industry in the Russian Federation. The vessels will be operated by Atomflot, the management of which is also transferred to Rosatom, from the Ministry of Transport. The vessels are; the already decommissioned *Lenin* (built 1959) and *Sibir* (1978), and the still operational *Arktika* (1975), *Rossiya* (1985), *Taymyr* (1988), *Sovietsky Soyuz* (1988), *Vaygach* (1990), *Yamal* (1992) and *50 Years of Victory* (2007). Russia also has a nuclear-powered Lash cargo carrier, *Sevmorput*, which according to Murmansk Shipping Company is to be converted into an offshore drilling vessel. The plan is to do the conversion at the Zvezdochka plant in Severodvinsk. The state owns 25.5% of the shipping company. **NA**

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The World Superyacht Awards

Young Designer of the Year 2009

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

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

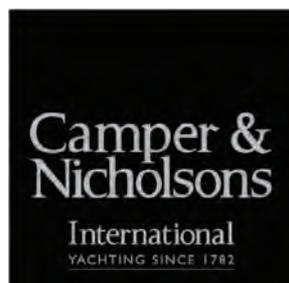
Introduced with great success in 2008, the World Superyacht Young Designer Award competition provides a showcase for young designers to demonstrate their ability and talents, and encourages the development of the next generation of superyacht designers.

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

The Competition

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

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



unique combination of form and function, which is the modern superyacht.'

The Award

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

The sponsor

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

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

The closing date for entries is 31 Jan 2009. If you are interested in submitting an entry or would like more information, contact Giuseppe Gigantesco, E-mail: ggigantesco@rina.org.uk, Tel: +44 (0)20 7235 4622

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

Admiralty promoted in the Arctic

Russia's state-owned Admiralty Shipyards (Admiralteyskiye Verfi), is to form the main asset of the Western holding of United Shipbuilding Corp.

Admiralty Shipyards is demonstrating its ability to meet new market needs with the construction of a pair of double-acting Arctic tankers for JSC Sovcomflot, *Mikhail Ulyanov* and *Kirill Lavrov*. They will transport oil from the Prirazlomnoye oil field, now under development in the Barents Sea, and will have an overall length of 258.75m, length between perpendiculars 235.77m, moulded breadth of 34m, moulded depth of 20.8m, and a draught of 13.6m. Their diesel-electric power plant will consist of four 6250kW diesel generators, while the propulsion system will comprise of a pair of ABB Azipod units, each rated at 8.5MW. Aker Kvaerner will deliver the bow loading system, the mooring system and emergency towing system for the two vessels, in a contract worth NOK40m (US\$6.82 million). The system delivery dates that have been set were September 2008 and January 2009.

The keel of the first vessel was laid in June 2007. At that time, the launching

of the first vessel, and keel laying of the second, was scheduled for August 2008. The delivery of the first vessel is now scheduled for 24 April 2009.

The operational start-up of the Prirazlomnoye oil field was recently delayed by another year, to 2011, which means that the vessels will have to be used elsewhere temporarily.

These shuttle tankers have been specially designed for efficient operation in Arctic seas in winter ice conditions. Their hull structures are designed in accordance with LU6 ice-class, under the classification of the Russian Register of Shipping. Lloyd's Register will verify structural and fatigue performance of the hulls, and will apply some class notations for the vessels' special features, including the dynamic positioning and bow loading systems, and the EP environmental protection notation.

Sovcomflot is also building three similar 70,000dwt tankers at Samsung Heavy Industries. The ships are intended for export transportation of Lukoil-

ConocoPhillips oil from the Varandei offshore terminal in the Pechora Sea. The first vessel in the Arctic shuttle tanker series, *Vasily Dinkov*, was recently delivered and loaded the first oil from Varandei in early June. The second tanker in the series, *Kapitan Gotsky*, was delivered at the end of May, and the delivery of the third vessel, *Shturman Albanov*, is scheduled for March 2009.

These vessels have an overall length of 257m, moulded breadth of 34m, moulded draught of 14m, and offer a service speed in open water of 16knots. These diesel-electric ships also have Azipod propulsion, two 10MW units each, and will have a total machinery power of 24MW, supplied by three main diesel generators. The vessels are designed to operate in temperatures down to minus 40°C and can break up to 1.5m thick ice without icebreaker escort. They are built to ABS class, except the hull, which is built to Russian Register ice class LU6. The ships have a dynamic positioning system and a helicopter pad. **NA**

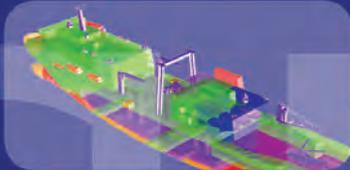
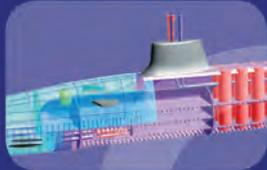
TECHNICAL PARTICULARS

70,000dwt tanker from Admiralty Shipyards, main particulars

Hull number 02750
 Length overall: 257.00m
 Breadth: 34.00m
 Depth: 21.00m
 Deadweight: 70,000dwt
 Draught: 13.60m
 Speed: 16.00knots
 Technical Management : Unicom
 Management Services, Cyprus
 Commercial Management : ...Sovcomflot
 Varandei
 Class notation: KM, +LU6, 1A1
 'Oil Tanker' (ESP) / +
 100A1 Double Hull Oil Tanker,
 +LMC, Helicopter Landing Area,
 ShipRight (SDA, FDA, CM), SPM,
 UMS, ICC, ESP, NAV1, IBS.

The Admiralty Shipyards has a capacity to build up to 70,000dwt vessels on its two open slipways. A series of nine 47,400dwt product tankers for Sovcomflot was recently completed at the yard.





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Cruising into the future

Last month saw the Future Engineers event held on the *Queen Mary 2* cruise liner.

An event that launched a programme of educational days, October's Future Engineers seminar was designed to raise awareness among school children of the possibility of a career in the marine industry and to provide them with advice on how such a career might be achieved. Future Engineers host Debbi King announced: "We are launching what we are hoping will lead on to many similar events."

The day consisted of a short presentation in the morning made by the commodore, chief engineer and naval architect of the *Queen Mary 2*, as to how their interests were sparked when they were young to pursue careers in the marine industry and how their careers developed to the roles that they work in now. Stephen Payne, naval architect of *Queen Mary 2* gave a short introduction to how *Queen Mary 2* was designed and constructed.

The day proceeded with a tour around *Queen Mary 2* to finish off the morning and then school children were taken to Quilleys School of Engineering, where advisors were on hand to answer any questions.

Also at the event was Jordan Vos, a 10-year old who was invited over from Botswana to attend the event. After seeing the tv programme 'MegaStructures' Jordan became enthused about cruise liners and over the past 12 months has been corresponding with Stephen Payne about his new found interest. **NA**



From left to right: Stephen Payne; OBE RDI FEng FRINA MNM HonPhd(Science) BSc(Eng) CEng, naval architect, RMS *Queen Mary 2*, Jordan Vos and Ronnie Kerr; I Eng FIMarEST, chief engineer, RMS *Queen Mary 2*.

School children toured on *QM2* as part of the Future Engineers seminar, the first of what organisers will be many similar events.



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Tanker stability issue rests in the balance

Trenchant opposition has come from parts of the shipping industry to proposals to develop new regulations on tanker stability, but the issue is set to resurface at December's Maritime Safety Committee meeting.

The International Tanker Parcels Association continues to take issue with the thrust of work to develop new regulations on oil, chemical and gas tanker stability, being driven by International Maritime Organization administration sponsors Denmark, Finland, Germany, Norway, Sweden and the United Kingdom, in association with tanker operator trade body Intertanko.

The proposals appeared to have been stopped in their tracks after heated debate and resistance from other parts of the shipping industry at July's meeting of the SLF (Stability, Loadlines and Fishing Vessel Safety), but as the remit of IMO Subcommittees is only to do the bidding of their parent committees, it will be up to December's 85th session of the Maritime Safety Committee to decide whether the proposals can go forward.

A paper, submitted by the sponsors to the 83rd (July 2007) Session of MSC proposed a high priority new work programme item devoted to the issue of damage stability on tank vessels. The co-sponsors said they believed that oil, chemical and gas tankers regularly operated in conditions with reduced or zero levels of residual stability and proposed that these vessels should be required to demonstrate compliance with the relevant stability requirements to Port State Control, preferably by use of computerised onboard systems.

The document proposed the development of new guidelines for the verification of damage stability requirements contained in existing instruments for tank vessels, and for consideration of their application on new and existing vessels to ensure the consistent verification of damage stability on such vessels prior to departure.

Uniform application

The United Kingdom previously submitted document MSC 82/18/3 concerning the

lack of damage stability verification on tank vessels prior to departure, inviting the MSC to consider the development of a circular on the issue and how global and uniform application of these requirements may be ensured.

"The co-sponsors said they believed that oil, chemical and gas tankers regularly operated in conditions with reduced or zero levels of residual stability"

The UK administration said it had conducted inspections on ships within its ports, consulted with industry and other flag State Administrations and that it and its co-sponsors remained "concerned that provisions relating to compliance with damage stability requirements in IMO instruments are not being met in accordance with approvals granted by flag Administrations and their delegated authorities."

In particular, the co-sponsors said that they believed that compliance with the provisions of:

- 1 MARPOL Annex I, regulation 28 (oil tankers);
- 2 IBC Code, chapter 2.9 (gas tankers); and
- 3 IGC Code, chapter 2.9 (chemical tankers),

were frequently not being verified before departure when vessels' load cargoes may

not be in accordance with the standard loading conditions in their approved stability information.

"In this respect, the co-sponsors believe that there is presently an unacceptable increase in the risk of loss of life and/or marine pollution following a damage or grounding to such vessels," the paper said, "and that this requires urgent action to ensure compliance on a global basis."

Reliance was often being placed on the use of intact stability computer programs, but these did not confirm compliance with damage requirements.

The UK said that, during inspections, it was found that more than 50% of tank vessels regularly operated with loading conditions which were not included in their approved Stability Information Booklet and only used intact stability computers to check these conditions.

"The importance and the difference between intact and damage stability requirements does not appear to be fully appreciated by seafarers, and the situation is seen to be confused through mandatory carriage of longitudinal strength computers under classification rules on many tank ships, most of which also incorporate an intact stability assessment module," the co-sponsors said.

"Taken in conjunction with the low margins of stability often exhibited by the standard loading conditions in approved stability information for tank vessels, there is a probability that these ships are regularly operating in loading conditions with reduced or zero levels of residual stability, even where these loading conditions appear to be closely related to a standard loading condition."

Loading options

There are currently three possible options for an operator to demonstrate compliance with damage stability:

- 1 to load the vessel only in accordance with standard loading conditions from the approved Intact Stability Information Booklet, as these should also have been approved for damage;
- 2 where there is a significant variation from the standard loading conditions in the approved Intact Stability Information Booklet, to obtain approval from the Administration, or a recognised organization acting on its behalf, for the proposed loading condition (see Note below); or
- 3 to use an approved Stability Programme or other acceptable method to check that all loading conditions comply with damage as well as intact stability, in which case the use of such a stability programme or other method must be specified in the stability book or on the certificate of fitness.

For maximum operational flexibility it was the opinion of the co-sponsors that the only practical solution was to fit an approved damage stability computer or other acceptable method of damage stability verification on all tank vessels.

The development and introduction on tank vessels of acceptable methods to evaluate and verify damage stability compliance of alternative loading conditions from those in the approved stability information (such as stability programmes or simplified critical KG data), would serve to correct the present lack of damage stability verification observed on tank ships, they said, noting that IACS has already published unified requirement UR L5 concerning approval of stability programmes for fitment to ships contracted after 1 July 2005, and that this contains information on performance and accuracy.

“It is considered that the development of guidelines for a definitive calculation method to be used for verification of damage stability in conjunction with this approval standard would form a suitable basis for a solution based upon stability programmes or simplified critical KG data.”

The additional cost for such vessels would only be that related to the

cost of modifying the programmes to suit the guidelines for a definitive standard calculation method developed in accordance with the new work programme. “This cost is likely to be low or included as a programme upgrade,” the co-sponsors argued.

“It is anticipated that the likely range of software costs involved would be between £1,000 and £8,000, to which the associated costs of training personnel must be added. For other methods, such as development of critical KG data, the

“ITPA said that, at MSC 83, ‘many’ had pointed out that ‘no justification had been provided for the allegations in the paper’”

compliance costs are anticipated to be no more than £5,000 plus associated costs of training personnel.

“The compliance costs of a stability computer or critical KG data based system are both considered to be negligible compared to potential costs resulting from an incident resulting from non-compliance with existing damage stability provisions within IMO instruments.”

Small outlay

Set against such a small outlay, the co-sponsors said that a uniform requirement to undertake damage stability verification on all tank vessels prior to departure would provide “a significant increase in maritime safety, and a reduction in risk of loss of life and marine pollution”, and ambitiously targeted a completion date for the new rules by 2009, with a view to work being passed on to the SLF Sub-Committee for completion.

However, last year’s MSC saw heated

debate on the matter. ITPA said that, at MSC 83, “many” had pointed out that “no justification had been provided for the allegations in the paper and asking that more information be provided before proceeding with this issue. In the end the proposal was accepted by a very small margin.”

However narrow the margin, the function any IMO Subcommittee is only to follow the direction of, and develop the work given by, its parent committee. Thus, the issue appeared on the agenda at July’s SLF meeting, with the original co-sponsors of the paper to MSC submitting a further paper, reiterating their concerns. By way of repost, ITPA, in concert with the International Chamber of Shipping and the Oil Companies International Marine Forum, jointly submitted a paper outlining concerns of their own about the proposals, and suggesting that information should be provided about the extent of the alleged non-compliance, including the number and type of vessels involved, in order for the Subcommittee to be in a position to make an informed decision on this issue; and following extensive debate, the Subcommittee noted: “that the majority of the delegations considered that no justification or compelling need has been demonstrated and strongly supported the view of IPTA, OCIMF and ICS that more information on the alleged non-compliance (e.g., type, size, age and the number of vessels involved) is needed to decide on the course of action on the matter.”

IPTA further explained that, due to their high degree of subdivision, chemical tankers normally have high margins of damage stability and that there is widespread understanding within the industry that damage stability issues are dealt with at the design stage prior to the issuing of Certificates of Fitness.

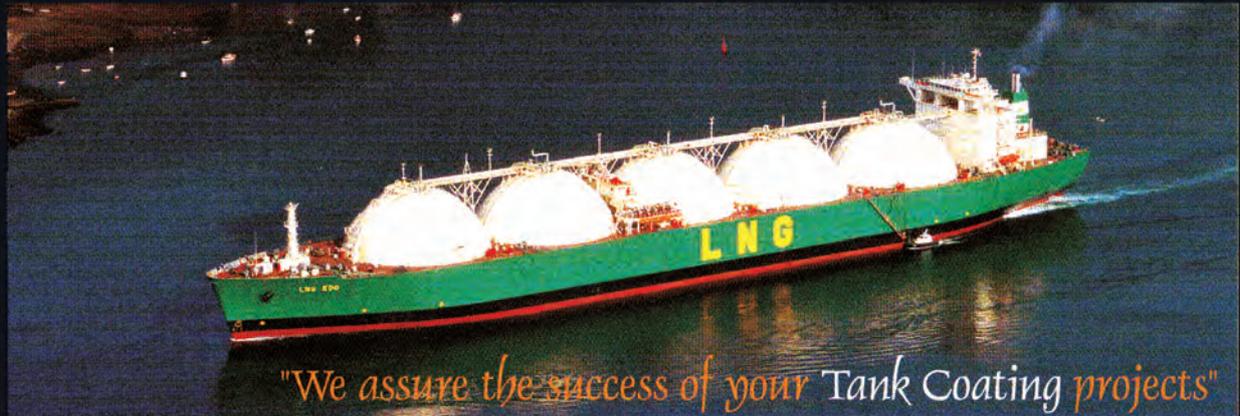
This conclusion will be reported back to the Maritime Safety Committee in December, when a decision will be made on whether to ask the Subcommittee to consider the issue further when it next meets in 2010. **NA**



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Segregated thinking

Eitzen Chemical's ambitious chemical carrier newbuilding programme continues apace, with the delivery of three ships in the last three months, and the launch of another.

Eitzen Chemicals, which planned for 33 newbuildings for delivery between mid-2007 and 2010 (with 23 ships featuring coated tanks and 10 stainless steel tanks) has committed some US\$752.3 million to its current newbuilding plans, with new ships coming in both as additional and replacement tonnage. The full plan envisaged delivery of four 8000dwt chemical carriers, six 12,000dwt ships, 10 of 13,000dwt, one of 20,000dwt, four of 25,000dwt, and eight of 46,000dwt. With nine ships having been delivered in 2007, 13 are due this year as a whole, seven in 2009, and four in 2010. Overall, the phase-in of the new tonnage, when coupled with the phase-out of older ships, will see the average size of Eitzen-owned vessels rising 9% from 16,180dwt to 17,598dwt.

Among the deliveries, *Siteam Discoverer* stands out in technical terms, as the latest of a series of eight 46,190dwt fully IMO II-compliant chemical carriers from Croatian yard Brodogotir Shipyard that are marked by a high degree of flexibility in terms of the cargoes they can handle.

Like three predecessors (Brodogotir is delivering these complex ships at a rate of two per year), the 182.9m length by 32.2m breadth by 17.2m deep *Siteam Discoverer* features a greater number of tanks (20) than a standard chemical carrier, providing capacity for a greater variety of cargoes. Tanks feature a mixture of epoxy and zinc coatings.

Capable of 15.5knots-16knots, by virtue of an MAN B&W 6S50MC main engine, generating 8580kW at 127revs/min, these ships offer cargo capacity of 52,409.7.5m³, but are most notable for the availability for segregated cargo grades (17), where odd tanks feature Amercoat 253 coating, and even tanks feature Dimetecote 9HS. Pumps and piping are beefed up, when compared to conventional chemical carriers of this size, with the cargo pipe material being of the robust AISI 316L type, and 16 cargo pumps being to the high capacity FRAMO centrifugal hydraulic configuration, capable



Siteam Discoverer – an innovative 46,190dwt chemical carrier bristling with new cargo handling and storage attributes.



Sichern Montreal – a 13,000dwt “standard workhorse” on launch.

of handling 500m³/hr.

They are also fitted with a Nitrogen plant, in the shape of 3750m³/hr (@ 5% O₂) capacity Smit-Gas systems from Aalborg. Where standard tankers of this type tend to have only inert gas systems installed these ships are equipped with high quality nitrogen systems providing much more flexibility in cargoes. The system uses hollow fibre membranes to separate air into nitrogen and oxygen. The principle of separation is based on the selective permeation of nitrogen and oxygen. Each gas has a characteristic permeation rate. Nitrogen permeates slowly, oxygen, CO₂ and water rapidly, through the membrane. This allows nitrogen to be separated from oxygen.

Continuous monitoring of the gas ensures that it is always of the correct purity. The membrane type nitrogen generator is of skid mounted design.

Also of technical interest are the six 12000dwt, IMO II and IMO III chemical carriers featuring stainless steel tanks, being

built by Sasaki Shipbuilding Co, of Japan. These 123.85m long ships, which feature a moulded breadth of 20m and a moulded depth of 11.5m, will operate over 11,400 nautical miles and, with each ship being powered by an MAN B&W 6L35MC (Mk6) main engine, command a speed of 13knots.

Like their larger counterparts from Brodogotir, they are distinguished by their relatively large capacity for segregated cargo grades (20), and the consequent need for high grade piping (SUS 316L grade), as well as their own powerful FRAMO main cargo pumps, exhibiting capacity for 2 x 100m³/hr of materials. Like their larger counterparts, these ships also include nitrogen generators, in this case operating at 1500N m³/hr.

Meanwhile, in August, South Korea's 21st Century Shipbuilding Co, of Tongyeong, launched the 13,000dwt chemical carrier *Sichern Montreal*. Described by an Eitzen spokesman as a “standard workhorse”, this ship is nonetheless interesting from a shipbuilding point of view, because it is indicative of the way South Korean yards have been willing to become involved in building specialised ships of this size. For Eitzen, delivery of this ship, slated for November, will see its fleet of vessels of this size rise to six, in what the owner describes as a “new segment” of the market that has become increasingly acceptable to the oil and chemical majors.

In August, Eitzen Chemical took delivery of *Sichern Iris*, an 8140dwt stainless steel IMO II chemical carrier flying the Maltese flag, from Sekwang Heavy Industries, of Ulsan. The 115m long, 18.2m wide by 9.6m deep, 10-stainless steel tank ship is the first of three vessels to come from this yard. A fourth vessel of around the same size, logged by Eitzen as a newbuilding due delivery in August 2007 was the 8200dwt ship *FS Salomé*, actually ordered by Eitzen acquisition Fouquet Sacop, and subsequently on-sold.

Earlier, in July, the shipowner took delivery of *Sichern Eagle*, a 25,421dwt IMO II chemical carrier flying the Singapore flag, built at Dae Sun Shipbuilding in Busan. **NA**



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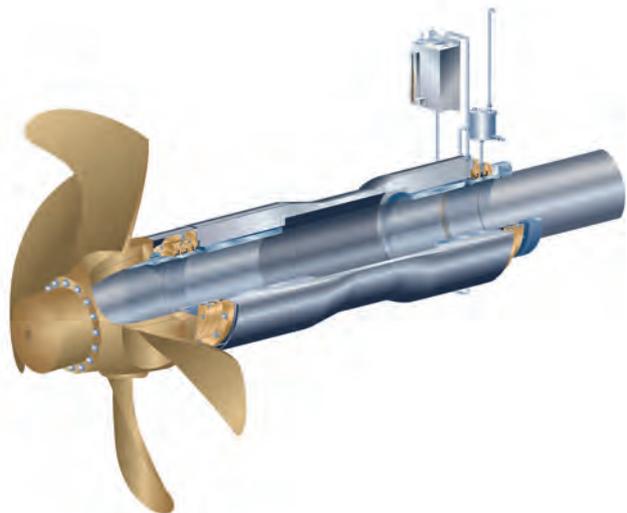
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Building to the common denominator

Further progress on the first construction project in the USA to observe Common Structural Rules (CSRs) and to feature the modular build approach.

Work continues at US Gulf Coast yards on the completion of three 49,000dwt shallow draught IMO Type II and III chemical/product tankers that will be the first Jones Act tankers to be delivered to the Common Structural Rules from the International Association of Class Societies that came into effect in April 2006.

They also will be the first vessels of this size to be built in the USA using the modular construction concept. The vessels will go on long-term time charter to Shell Trading in 2009/2010.

Moreover, these ships will also be distinguished by their custom-made propulsion systems.

American Electric Technologies and L-3 Westwood recently announced that L-3 was providing twin shaft line electric propulsion systems to affiliates of San Antonio-based AHL Shipping Company for the building of the three, 330,000bbls capacity ships, in connection with a charter agreement with Shell Trading (U.S.) Company (Stusco).

Shell plans to use these vessels to transport crude oil, chemicals and products within its domestic US trade lanes. Delivery of the first twin screw, diesel electric, double-hull, ship is now expected in September 2009, with the last to follow by December 2010.

The use of CSRs resulted in the re-evaluation of the initial ABS Safehull Part B Dynamic Load Analysis (DLA) results against the newly harmonised rules. Aker Yards Marine handled the detail design in the project, while Canada-based Genoa Design International has handled the construction work packages.

The design uses primarily mild steel with high tensile steel used in higher stress locations such as the main deck, sheer strake and upper strakes of longitudinal bulkheads. The aft deckhouse is



Artist's impression of the first Jones Act chemical and product carriers ever to be built to IACS Common Structural Rules.

configured for a complement of 30 crew that includes 22 single cabins for ship personnel and an additional 2 x 4 person cabins for the riding crew.

After an evaluation of construction possibilities, this build project is being undertaken in a multi-location 'modular construction' approach, using Atlantic Marine, Alabama, as the primary fabrication and assembly shipyard, but also R&R Construction, of Port Arthur, Texas for power module and maindeck work, Jamestown Marine Metal Sales, of Boca Raton, Florida, for deckhouse and casing module fabrication, where it was concluded that a single shipbuilding location would not be able to meet the target price.

The final module breakdown includes: main hull including bow structure, aft end structure, machinery power module, deckhouse, and main deck/cargo pipe rack. The philosophy behind each module boundary was to maximise pre-outfitting and commissioning of the systems and machinery prior to final assembly and to minimise the interface connections required at the interface shipyard facility.

The final design is a vessel with featuring 12 tanks, and an overall length of 188m, a beam of 32m and a design draft of 11m.

The twin-screw diesel electric machinery plant is configured with three medium speed diesel generator sets of 5765kW capacity each, any two of which will provide enough power to operate the vessel under normal conditions driving the 2 x 4650kW propulsion motors which give the vessel a range of 12,000 nautical miles at a service speed of 14knots.

Caterpillar Marine Power Systems will propel the tankers, using three MaK 12 M 32 C generating sets per ship, equipped with Siemens alternators. Each engine set will weigh about 120tonnes and operate at 720revs/min. Caterpillar is delivering nine MaK 12 M 32 C generating sets in total from its medium-speed engine facility in Rostock, Germany. There is also an option to power three more tankers with the same engine configuration.

As part of the construction programme, a deal worth US\$5 million has been signed, through which L-3 Westwood has contracted AETI to develop custom-built, commercially oriented marine switchgear for the project, for end customer VT Halter Marine and affiliates of AHL Shipping Company.

AETI said it would work with L-3 to provide the propulsion power distribution systems along with the secondary power distribution systems. Deliveries for VT Halter Marine are expected to be completed by late-2008. **NA**

Tanker entrance from Cicek shipyard

Cicek shipyard based in Tuzla, Turkey recently launched a new series of oil/chemical tankers.

The first of four 3150dwt oil/chemical tankers has just been launched from Cicek shipyard, where another three vessels are planned for delivery at four monthly periods in

2009. The tankers are destined to be used for worldwide trading to transport oil products, chemicals (IMO type II), vegetable, animal and fish oils. They were originally commissioned to the shipyard's own account, but have now been sold to Maltese investors, either to trade or for potential resale.

Bureau Veritas is classing these tankers to Ice Class B standards.

These tankers will be using 2 x six-cylinder Mitsubishi S12R-MPTK diesel engines, each generating 940kW at 1600revs/min, and are capable of 11knots, with manoeuvring achieved either via the twin azimuthing podded propellers or bow thrusters installed. Various adapted versions of the tanker are available, including refined products and bunker tanker options.

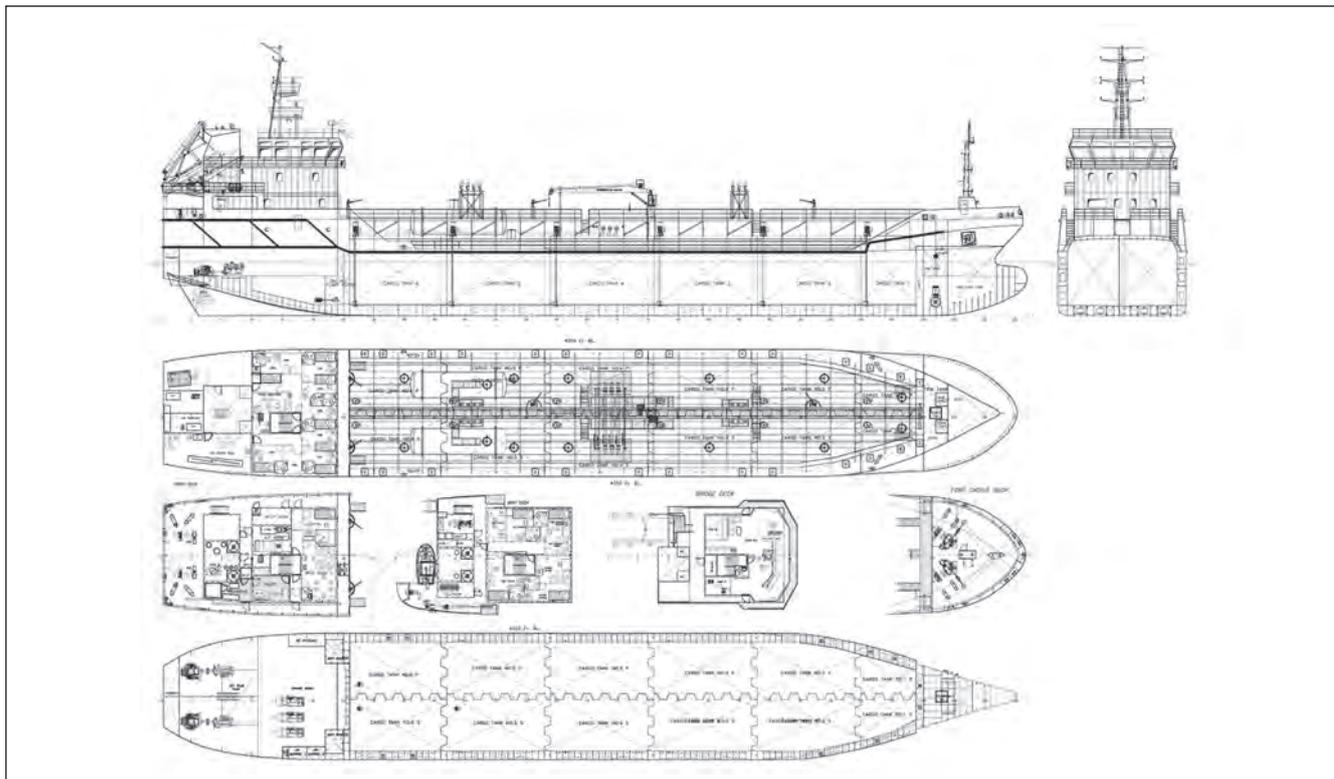
Berke Cicek, vice president of Cicek

shipyard, commented on these vessels: "New double-hulled vessels such as these are in great demand to replace older tonnage and because we took the initiative to start construction to our own account, the new owners have benefited from an extremely short delivery period. They are now talking to a number of potential charterers and are confident of finding immediate and profitable employment for these vessels."

He went on to say: "Our contract with this owner also allows for late changes in specification, for example in the choice of tank coatings, thus providing great flexibility when discussing potential charterers' precise requirements. We are, with due notice, able to make more radical changes, as might be requested were the current owners to decide to sell individual vessels rather than trade them." **NA**

TECHNICAL PARTICULARS	
3150dwt Cicek chemical tanker	
Length (oa)	84.9m
Length (bp)	77.97m
Breadth	12.60m
Depth	6.40m
Design draught	5.30m
Scantling draught	5.40m
Gross tonnes	1980
Main engines	2 x 6-cylinder Mitsubishi S12R-MPTK
	Generating 940kW @ 1600revs/min
Service speed	11knots at 85% mcr

3150dwt chemical tanker from Cicek.





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Cecil takes another bow

The first retrofit project has been commissioned to transform a MAN Diesel ME-C engine into a later generation ME-B unit.

Norwegian tanker owner Odfjell has signed an agreement with MAN Diesel to rebuild the main engine aboard *Bow Cecil*, the chemical tanker whose original type L60ME-C engine represented a breakthrough installation, in being MAN's first electronically controlled unit in service, pointing the way towards the supplier's subsequent development programme.

The agreement covers the rebuilding of *Bow Cecil's* engine from type L60ME-C to type L60ME-B, a process which is expected to proceed in two stages. The first of these occurred during a scheduled docking in the ASRY shipyard in Bahrain, encompassing most of October 2008, with the second taking place when a suitable gap in *Bow Cecil's* schedule arises.

MAN Diesel PrimeServ, MAN Diesel's after-sales arm, will provide technical back-up for both stages of the project.

The 37,500dwt *Bow Cecil* has played a central role in the development of MAN Diesel's ME-concept. In the wake of an agreement between MAN Diesel and Odfjell, prototypes of the ME engine's components and systems have been thoroughly tested on its main engine since November 2000. With the rebuild, the world's first ME-B retrofit, *Bow Cecil* will be equipped with MAN Diesel's new generation electronically controlled prime-mover technology.

At the original presentation of the first ME-engine in February 2003, Peter Sunn Pedersen, executive vice president, MAN Diesel, praised the introduction of "the intelligent engine", which he said: "can be updated during its entire lifetime". As such, the rebuild of *Bow Cecil's* engine, especially the updating of its fuel-injection control technology, is another stage in the continuous development of MAN Diesel electronic technology.

As noted, *Bow Cecil's* main engine was originally designed as an L60MC engine and therefore still has a standard camshaft in place. Accordingly, the engine is particularly suited for testing ME-B technology, which uses a camshaft-operated exhaust valve and



Bow Cecil - the first ship to feature an electronically controlled main engine from MAN Diesel.



Bow Cecil's L60ME-C main engine will be rebuilt, in line with new ME-B levels of control.

an electronically controlled fuel-injection system. In addition, the physical dimensions of the S46- and S60ME-B bedplates in particular are identical to those of their MC-C equivalents, facilitating retrofit

installation of the new technology on such engines with the same footprint if required. Electronic fuel injection makes the new ME-B engines equipped to meet Tier-II emission requirements.

As with the larger MAN B&W ME-engines, an Alpha Lubricator comes as standard with all ME-B engines, to ensure a low cylinder lubricating-oil consumption.

The ME-B range of MAN B&W diesel engines is now offered in 35-, 40-, 46-, 50- and 60cm models in the smaller bore range, while the ME-C concept covers the medium- to large-bore segment of the market. **NA**

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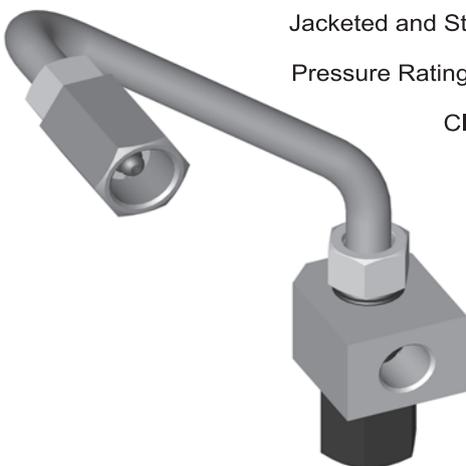
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Novoship gets to the *Point*.

Latest delivery for Russian owner is designed to carry six different types of cargo.

JSC Novoship (Novorossiysk Shipping Company) recently took delivery of *NS Point*, the third of an eventual four identical chemical and product carriers due from SLS Shipbuilding in South Korea, as part of the Russian owner's fleet renewal programme.

The tankers *NS Power* and *NS Pride* were delivered in 2006. *NS Parade* will complete the line before the end of 2008.

These 40,000dwt (25,467gt), double-hull tankers are designed to carry up to six various types of cargo, including light oil and chemical products, simultaneously, and offer total capacity for 43,018.5m³ of cargo.

At 176m long overall, these ships feature a moulded breadth of 31m, and a keel to masthead height of 46.25m and a cruising range of 14,700miles, and have been built



NS Power, the first of four identical chemical/product carriers, delivered to Novoship by South Korea's SLS shipbuilding.

to Det Norske Veritas class +1A1 Tanker for Oil and Chemicals. All cargo tanks and slop tanks are protected by phenolic epoxy coatings, while cargo tanks are constructed to include perforated centre line bulkheads.

Each tanker features 12 x 500m³/hr capacity and 2 x 200m³/hr capacity

centrifugal cargo pumps, a 'stream' cargo heating system, an inert gas system, and a crude oil washing installation.

Novoship said that the design and operating characteristics of these vessels "completely satisfy the ultimate requirements of the Oil Majors as well as the requirements set by international and national conventions". This includes compliance with the latest edition of the OCIMF (Oil Companies International Marine Forum) 'Recommendations for Oil Tanker Manifolds and Associated Equipment'.

NS Point, as is the case of the other vessels in the fleet renewal, is destined to handle Russian exports, as new petroleum refineries come into operation, and will be crewed exclusively by Russian nationals from Novoship Crewing Ltd. **NA**

In praise of NEWBUILCON

Standardised newbuilding contract format gets the thumbs up from Malaysian product tanker owner.

BIMCO's NEWBUILDCON standard newbuilding contract has elicited strong endorsement from petroleum logistics provider AET, after the shipowner used the format for the first time in placing orders for three product tankers from Russia's Okskaya Shipyard in early September.

The contract covers a trio of 6600dwt ships, calling for all three to be delivered by the Navashino-based yard between July and December 2009.

Malaysian owner AET, which is a subsidiary of MISC, said the additional ships would expand its fleet capacity and extend the geographical coverage of its operations. Long-term employment for the vessels had already been secured. The 139.9m long tankers will be 16.7m across the beam and 7m deep, and will feature a draught of 4.06m,

and six cargo and two slop tanks, offering a total capacity for 7770m³ of cargo. They will be deployed in the Caspian Sea and operate at speeds of up to 10knots.

Each ship will feature two 16V159/159hN main engines from Cummins, with the same supplier set to deliver auxiliary engines, in the shape of two K19-CP335DM/5 diesel generators, each producing 335KW, plus one 6C-CP151DM/5 diesel generator (151kW), and one emergency generator (6C-CP136DM/5 - 136 kW). The tankers will each operate with two, four-bladed fixed pitch propellers, 1.95m in diameter.

Commenting on the decision to use NEWBUILDCON in this latest order, Zurina Raja Abu Bakar, AET's legal counsel responsible for orchestrating the deal, said: "NEWBUILDCON provides a solid

contractual platform that facilitates the placement of newbuilding contracts for both shipowners and yards. It represents an excellent standard form suitable for global use.

"In line with AET's commitment to innovation, we are proud to join the very select group of pioneering owners to have used NEWBUILDCON to date. We are also grateful to Okskaya Shipyard for their willingness to embark on this journey with us, setting a precedent for other yards to follow.

"Our first experience with the standard contract form has been a positive one, leaving us in no doubt that we will adopt it in future orders. It is our hope that other owners will follow our lead and establish NEWBUILDCON as the accepted international standard for new vessel orders." **NA**

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Indian tanker deal may be pit stop to MARS

Fincantieri chose Euronaval, the defence industries trade fair, to announce that it had secured an order to build a fleet tanker for the Indian Navy, and to insinuate that the order set it in good stead to secure the Royal Fleet Auxiliary's coming order for six replenishment tankers.

Fincantieri's deal to build a single fleet tanker for the Indian Navy represents the first order for such a ship for which India has chosen a foreign company. Fincantieri said it had competed against leading international players, especially from Russia and South Korea.

The vessel, which will be built at the shipyards in Liguria, for delivery at the end of 2010, will be 175m long, 25m wide and 19m high and will have a displacement at full load of 27,500tonnes. The ship will be powered by two 10,000kW diesel engines, which will enable it to reach a maximum speed of 20knots and its propulsion system will feature an adjustable blade propeller. There will also be a flight deck onboard for medium-heavy helicopters (up to 10tonnes).

The ship will accommodate up to 248 passengers – crew and supplementary personnel.

Equipped with double-hatches, the vessel will be able to service four ships at the same time.

In accordance with the new Marpol regulations of the International Maritime Organization concerning the protection of the environment, this will be the

first ship of this type to be built with a doublehull, thereby improving protection of the fuel tanks and avoiding the risk of pollution in case of collision or damage.

Fincantieri has already built *Sagar Nidhi* for India, an oceanographic vessel for the National Institute of Ocean Technology (NIOT) in Madras, which was delivered at the end of 2007. In addition, in 2004 the company drew up two contracts with Cochin shipyard regarding the design of the engine, technology transfer and the provision of complementary services for the construction of the Air Defence Ship (ADS); activities are also in the process of being finalised for the sharing of the functional design and details of the propulsion system. The assistance stage at the Indian shipyard is about to start up shortly.

In order to better service the Indian area, Fincantieri said it had set up a permanent, representative office in New Delhi.

Commenting on the order, Giuseppe Bono, Fincantieri chief executive, said: "This further, important order confirms that the Indian market is strategic for our company, as it should be seen within the framework of a process of growing

internationalisation of our activities and a return to the military export market."

In view of the experience Fincantieri has gained in the construction of this vessel type, both for the Italian Navy and for a number of foreign navies, the company is one of four shipbuilders on the short list to build six RFA replenishment tankers, as part of the Military Afloat Reach and Sustainability programme. To consolidate its presence on the British market, Fincantieri recently formed an alliance with Birkenhead-based shiprepair and conversion specialist NSL (Northwestern Shiprepairers and Shipbuilders Ltd), a yard which has worked extensively on RFA ship maintenance and repair.

Under a former guise – that of Cammell Laird, facilities at NSL were also responsible for building some of the Royal Navy's finest vessels, including HMS *Ark Royal*, along with the Navy's first guided missile destroyer and a number of submarines. Today, NSL is a prime contractor to the Royal Fleet Auxiliary (RFA) Service.

Fincantieri said the alliance would "enhance support to Fincantieri's in pursuit of the tender to build six fleet replenishment tankers for UK Ministry of Defence (MOD) programme known as the MARS project".

Alberto Maestrini, executive senior vice president of Fincantieri's naval vessel business unit, said: "This is part of a larger strategy of collaboration with NSL and if successful with the MARS tender, the companies will pursue other business opportunities in the naval auxiliary, naval export and offshore markets." **NA**



Rendering of the new fleet tanker due to be delivered to the Indian Navy by Fincantieri.

Nitrogen generators come to the fore

Hamworthy to supply nitrogen generator systems for 10-ship series.

A series of 10 x 47,500dwt chemical tankers under construction for IRISL at South Korea's Hyundai Mipo Yard will feature the largest ever nitrogen generator systems supplied by Hamworthy Moss.

In an US\$11 million deal that ranks alongside the largest contracts ever secured by Hamworthy Moss, the order calls for nitrogen generators capable of delivering 3750 Nm³/hr of nitrogen at a purity of 95%.

The 10 ships will be delivered between 2010 and 2012.

"Nitrogen generator systems have always been seen as a supplementary product to our combustion-based inert gas (IG) systems, and have been mainly used for inerting small volumes, such as flushing pipes," says Geir Hellum, managing director of Hamworthy Moss AS. "This is now set to change as we are



Hamworthy Moss nitrogen generator.

extending our portfolio to include nitrogen generators as ships' main IG plants.

"A new design has been developed, new suppliers have been brought in, components have been tested, better tools and understanding are being applied to put the quotations together, and plans for further improvements are in place," Mr Hellum adds. The result has been that order intake for

nitrogen generators steadily increasing over the past year.

"This highly contested order at one of the most important builders of chemical carriers is proof that the additional effort made in the development of this product is paying off, and that we now have a very competitive product, both technically and commercially."

Moss nitrogen generators use membranes to separate gases by the principle of selective permeation across the membrane wall. Ambient air is compressed, rigorously filtered, and temperature controlled before entering one or more membrane modules, each containing thousands of hollow fibres. Within these fibres, the separation of air takes place producing nitrogen gas under pressure. The resulting nitrogen is dry and depleted of carbon dioxides. [NA](#)

RINA – LLOYDS REGISTER EDUCATIONAL TRUST SHIP SAFETY AWARDS

Nominations are invited for the 2008 RINA - Lloyds Register Educational Trust Ship Safety Awards. Entries close 1st January 2009

The RINA- Lloyds Register Educational Trust Ship Safety Awards

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

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

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

There are separate categories for universities and industry. An Award of £1500 is made in each of the categories and will be presented at the 2009 RINA Annual Dinner.

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



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Sestao yard digs out another order

Further order from dredging company lifts spirits at La Navale yard.

The rich seam of orders from dredger owner Jan de Nul worked by Sesto's Construcciones Navales del Norte has this year yielded another nugget, in the shape of a highly specialised ship designed to work in shallow waters and confined spaces.

In July, Jan De Nul Group and the yard, now coming to be known as La Naval, signed an agreement for the construction of a 30,500m³ hopper dredger (JDN8035), completing the Belgian operator's present investment programme for hopper dredgers, which ranges from the from the 46,000m³ mega hoppers *Cristóbal Colón* and *Leiv Eiriksson*, down to the 3,400m³ *Alvar Nuñez Cabeça de Vaca* and *Sebastiano Caboto*.

The latest order for La Naval is the fourth ship project to come its way in recent times from Jan de Nul. It specifies a vessel with a design draught of only 11m and a length between perpendiculars of only 161.5m. In the design process, Jan de Nul says that much attention has been paid to the efficient use of installed power, resulting in a low fuel consumption, and lowered emissions.

Two suction pipes are to be installed, of 1200mm in diameter and equipped



JDN 8035 – the latest order to be placed by Jan de Nul at Sestao's La Navale yard.

with submerged dredge pumps, each commanding 3400kW of power. Double walled, electrically driven shore discharging dredge pumps with a total power of 15,000kW will enable discharging the load at a high rate, over long distances.

The vessel will be delivered by the end of 2010. An option for a second identical vessel has also been agreed on.

Meanwhile, work continues on the yard's other projects for its Belgian customer. On 27 August 2008 the keel laying of the trailing suction hopper

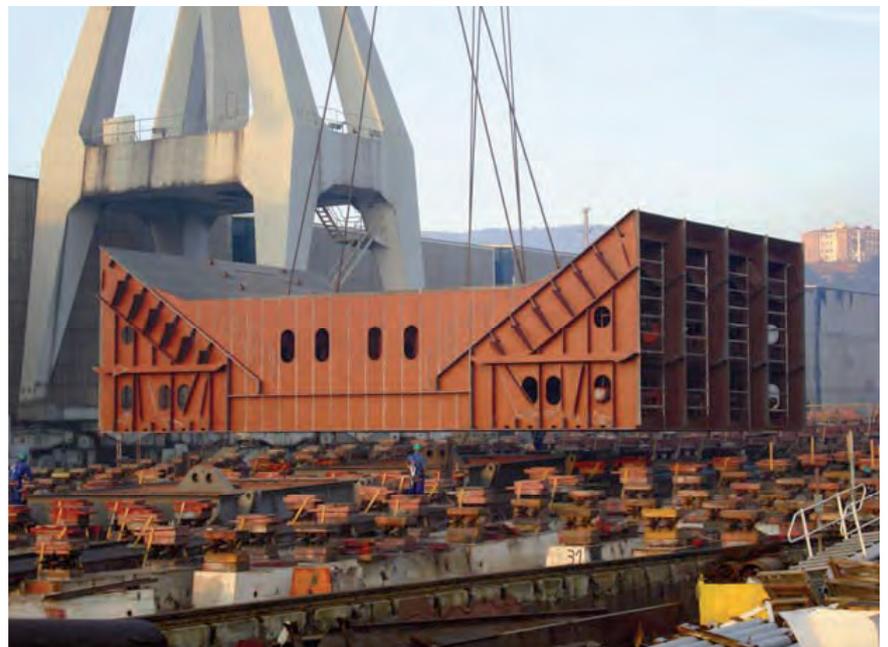
dredger *Leiv Eiriksson* took place at the shipyard. *Leiv Eiriksson* is the identical sistership of the 46,000m³ *Cristóbal Colón*, launched on 4 July 2008, which is currently being completed at La Naval.

These 213.5m long by 41m across dredgers will feature two shore discharge dredge pumps of the double wall type, driven by an electric motor via a gearbox, with power rating given as 7500kW at between 280rev/min-336rev/min at constant power. They will also feature two submerged dredge pumps driven by a 6500kW electric motor.

Construction on the slipway of this latest mega dredger is now underway, with the launch of *Leiv Eiriksson* foreseen in July 2009, and her delivery in early 2010.

Last, but by no means least in the batch of orders from Jan de Nul is the fallpipe vessel *Simon Stevin*, originally trailed as world's first subsea mining ship, to be known as *Jules Verne*, but now reborn as a 'multi-purpose fallpipe rock-dumping vessel', after a deal between Jan De Nul and Nautilus Minerals unravelled last year. [NA](#)

Keel laying of the mega-dredger *Leiv Eiriksson*.



TECHNICAL PARTICULARS	
JDN8035	
Hopper capacity.....	30,500m ³
Deadweight at design draught.....	41,500tonnes
Length overall.....	183.2m
Breadth.....	40.0m
Design draught.....	11.0m
Maximum dredging depth.....	93.5m
Suction pipe diameter.....	2x1200mm
Pump power (trailing).....	2x3400kW
Pump power (discharging).....	15,000kW
Propulsion power.....	2x10,800kW
Total installed diesel power.....	23,600kW
Speed.....	16knots
Accommodation.....	42

Expansion-minded Barreras

Leading Spanish shipbuilder adds dimension to its output and to the yard itself, writes David Tinsley.

One of the elements which has seen shipbuilding continue to play a key role in the economic wellbeing of Vigo and its surrounds is the vigorous approach to business shown by independent companies such as Hijos de J.Barreras.

Over the 10 years, since the company's shift from the state sector to private control, earnings from increased contract volume have been ploughed back into the yard's fabric and into its means of developing a diversified, higher added-value production offering.

That process has found fresh expression in the strategic plan rolled-out by the yard for the coming years, aimed at securing a further advance in the size and range of vessels that can be built at the Vigo premises, to give the company a better commercial positioning in the market. Realisation of the programme will raise maximum ship size to 250m in length and 30m beam.

This will be achieved by extending the two newbuild slipways 50m into the bay, and increasing the width by 10m towards the west side. New floodgates will be fitted to the slips. There will be commensurate investment in outfitting capacity, and the expansion project overall foresees an increase in the Barreras yard's construction surface area by approximately 6970m².

The Vigo yard has been entrusted with a further, major stage of investment by Naviera Armas, the Canary Islands-based ferry operator that has consistently modernised and expanded its fleet in recent years, emerging as one of the leading lights in the Spanish peninsula and inter-island traffic. The common theme in the process of fleet development has been the relationship with Barreras, and the collaborative and contractual links have reached a new level in the commitment to a further two newbuilds plus two on option, by virtue of the standard of tonnage involved.

At 176m length and 26.4m breadth, the ro-pax vessels are the largest ferries ever



Volcán de Tijarafe
– the second of a pair of sisterships built by Barreras.

ordered by Armas, and the chosen design reflects particular consideration of onboard comfort in keeping with the shipowner's aim of attaining what it describes as a five-star hotel quality. The ships will also be distinguished by a maximum speed of 26knots.

Barreras has conducted detailed investigations into vessel motions, one key aim having been to reduce vertical accelerations to very low levels, and thereby tackle the conditions that give rise to seasickness. The close attention to factors concerning the onboard environment reflects not only issues of passenger comfort and the competitive aspects relating to passengers' overall travel experience, but also crew habitability, and its bearing on crew efficiency and retention.

The new ferries have been designed for 1500 passengers and will offer 2000 linear metres for vehicles, including 600 cars. Operating flexibility has been a fundamental criterion in the technical

project, arising both from the nature of the Canaries' traffic, with its seasonal demands plus pure freight transportation needs, and from the owner's requirement to have the scope to efficiently deploy a ship on different routes over time.

Large panoramic terraces will be a feature of the new class, to give passengers maximum enjoyment of the views afforded by travel between and to the Canary Islands, and not least the sight of the colonies of cetaceans common on the routes involved.

Each will be powered by a bank of main engines incorporating German common rail technology, by way of four seven-cylinder examples of MAN's 48/60CR medium-speed design, to give an aggregate plant output of 33,600kW. The first of the new series is expected to be handed over in June 2010, with the second ferry due 12 months later. The fulfilment of a four-ship programme would represent approximately six million working hours, reinforcing the importance of the shipbuilding sector in

the Vigo region's economy and society.

Naviera Armas is considering allocating one of the two newbuilds to a new route connecting the Canary Islands with the Madeira archipelago and the Iberian peninsula. This was inaugurated in June 2008, as a weekly service. The operation has given Madeiran passengers a sea connection with the mainland for the first time, with the added advantage of being able to take their cars. Such has been the level of market receptivity that the company is thinking of upping the frequency to two sailings per week next May. The possible future deployment of one of the latest class on order with Barreras would give a further boost to capacity and service productivity.

The current sailing pattern entails departures from the Canaries every Friday, putting into Funchal, Madeira, on Saturday morning, and arriving in Portimao, in southern Portugal's Algarve region in the early hours of Sunday. The most recent addition to the fleet, the ro-pax *Volcan de Tijarafe*, is the current mainstay of the new connection.

Handed over in the early part of 2008, *Volcan de Tijarafe* is the second of two sisters built by Barreras. She was preceded in 2007 by *Volcan de Tamadaba*, and each offers a productive blend of capacity and performance within main dimensions of 154.35m overall and 24.20m breadth, corresponding to payloads of up to 1870 linear metres of vehicles and approximately 1000 passengers. The design represented an evolution, in terms of speed, capacity and passenger facilities, on Armas'

preceding pair from the Vigo yard, *Volcan de Timanfaya* and *Volcan de Taburiente* of 2005 and 2006, respectively. A ship of the same genre, *Volcan de Tamasite*, was commissioned from the same birthplace in 2004.

Another expansion-minded domestic operator, Eurolineas Maritimas, has embarked on a new stage of development of its Balearia fleet, encompassing four vessels, each different in size, capacity and intended deployment. The entire programme has been assigned to Barreras.

While serial production of high value-added ships is currently much in evidence at the Vigo yard, the Eurolineas contracts underscore the builder's flexibility and equal disposition towards singletons and sisterships. The impending completion of the 24,600gt ro-ro passenger ferry *Martin i Soler* will mark the opening delivery. She is due to be followed over the period up to May 2009 by newbuilds of some 23,000gt, 20,000gt and 2900gt respectively, all individually shaped to differing operational and service requirements. The company's extensive network maintained under the Balearia brand encompasses routes linking the Spanish mainland ports of Barcelona and Denia with the island harbours of Ibiza, Formentera, Alcudia, Ciutadella, San Antonia and Palma, as well as a fast ferry run between Algeciras and Tangier.

Martin i Soler is very much in the Barreras mould, providing a compact, productive earnings platform within main dimensions of 165.3m overall, 152.5m between perpendiculars(lbp), 25.6m

breadth, and powered by a pair of MaK 9M43 main engines for a service speed of 21.4knots. The vessel is certificated for a total of some 1200 passengers and crew, and her three cargo decks plus hoistable car deck provide for a range of ro-ro payload permutations including 1200 lane metres for trucks and trailers plus 328 cars, or 1720 lane metres of goods vehicles and 107 cars.

The second ship in the Balearia series is larger, at 177m lbp and 26m breadth, but with the same MaK main and auxiliary power installation as *Martin i Soler*. The modified, smaller design adopted for the third newbuild is encapsulated within a hull envelope of 137m lbp by 24.2m width, while the fourth ferry is intended for a specific operation dictating an lbp of 86.6m and breadth of 17m.

By embracing Norwegian design technology, Barreras has put down a new marker for Galician shipbuilding in one of the most advanced segments of the offshore vessel business, that of seismic research. Launched in June this year, *WG Columbus* has given first form to a project involving four diesel-electric ships equipped for 3D seismology worldwide, with the capability to deploy up to 10-12 streamers simultaneously. The series will be deployed by WesternGeco, part of the Schlumberger Group, which took over the original contractual owner of the newbuilds, Dubai-based Eastern Echo, earlier this year.

WG Columbus encapsulates the SX124 design developed by Ulstein Verft's sister

Martin i Soler launching.



The Royal Institution of Naval Architects

SURV 7 - SURVEILLANCE, SEARCH AND RESCUE CRAFT

27 - 28 May 2009, Poole, UK

First Notice & Call for Papers



The Royal Institution of Naval Architects will continue its successful SURV series of International Conferences in 2009 now in its seventh edition. Held at the home of the Royal National Lifeboat Institution in Poole, this is an apt venue for the discussion of such vessels and there will be an opportunity to view the RNLi's facilities and a range of equipment during the course of the proceedings.

With ever greater recreational and commercial use of the marine environment there is inevitably a higher rate of incidents where external assistance is required. This increased pressure on resources provides a new set of challenges that organisations need to adapt to, in order to continue to provide their high level of service.



The conference will provide a forum for discussion of both military and civilian vessels. We hope to include papers across the full range of vessels, equipment and methods, used by pilot craft, coastguards, and police as well as search and rescue organisations. Topics will include analysis of new designs, applications, and operations of these vessels, as well as review existing vessels and their use across all marine environments.

RINA invites papers from designers, builders, lifeboat institutions, police forces, coastguard organisations and operators on the following topics:



Design: Practice, philosophies, testing and development
New Vessels: Innovative features, trials and evaluation
Construction: Materials, techniques and quality control
Equipment: New ideas & products, control systems, navigation, auxiliary equipment
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We are also interested to hear from any organisation wishing to exhibit craft during the conference.

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company Ulstein Design, originator of the inverted Ulstein Bow embraced by the seismic sector for the first time in the new breed from Barreras. The ships will be unique in their field, setting a new standard with the revolutionary bow and all its benefits. The bow solution promises less speed loss in head seas, resulting in lower fuel consumption, along with an improved working environment to the benefit both of seismic operations and crew habitability.

Delivery of *WG Columbus* is imminent, with second-of-class *WG Magellan* expected to be ready in January 2009, to be followed at two-month intervals by the third and fourth ships. The 89m class has been specified with a DP-2 dynamic positioning system, essential to analytical control of seismic measurements as regards both quality and quantity. The diesel-electric powering and propulsion arrangements confer the highest degree of operating flexibility, and facilitate fast response in conjunction with smooth vessel movements. The plant is based on six main generators of 1710kW apiece, driven in each case by a 1800kW diesel engine.

Notwithstanding the major Nordic component to each vessel's equipment outfit, the project has yielded substantial spin-off for the wider, maritime-related industry in the Vigo area, beyond the main shipbuilding contractor itself.

The Spanish yard's track record in contract performance and in undertaking projects incorporating a very high outfitting work component had a signal bearing on its success in landing an export contract for an unusual type of offshore vessel designed primarily for an accommodation role. The 130m x 27m newbuild ordered by the Ostensjo Group subsidiary *Edda Accommodation* is due to be handed over during the first quarter of 2010.

In addition to providing living quarters for up to 600 people in offshore locations worldwide, the vessel will also offer a capability for personnel transfer to and from platforms, FPSOs and other units offshore. Suitability for deployment in areas exposed to the most inclement weather, such as the North Sea, eastern Canada and the northern Pacific, as well as to operations in the Gulf of



WG Columbus: setting a new standard for ships in the offshore field.



Image of *Edda Accommodation*, due to be handed over in the first quarter of 2010.

Mexico, West African waters and South East Asia, is indicative of the standard of design and engineering input to the project. Furthermore, the *Edda* newbuild will also lend itself to wider usage as an alongside accommodation vessel, whereby the number of berths may be increased to 1000.

Key features will include a heave-compensated, telescopic gangway for personnel transfers, the highest (DP3) class of dynamic positioning, a diesel-electric power and propulsion plant based on six AC generators of 2925kW, three 2500kW main propulsion thrusters aft and two such units forward, employing Voith Schneider Propeller (VSP) technology, plus two 1400kW tunnel thrusters forward.

The Spanish yard's drive into the offshore domain has engendered a further, capital-intensive newbuild project in the shape of a 160m specialist vessel equipped for offshore

construction and mining support tasks. Ordered by North Sea Invest of Norway, the dynamically positioned, diesel-electric ship will have the distinction of being one of the largest vessels to date to have been specified with Voith Schneider propellers, entailing three such propellers aft and two in the bow. She will also provide an important European reference for US-developed medium-speed diesel machinery, by way of six GE 16-cylinder V250 engines, as main genset drives. The 30m-beam newbuild will also incorporate Voith's proprietary roll stabilisation system and will be fitted with two large, heave-compensated cranes.

It is understood that North Sea Invest has entered into a long-term charter for the ship as a mining support vessel in Papua New Guinea waters. Barreras is scheduled to complete the outfitting of the ship and have her ready for handover by July 2010. **NA**

The Royal Institution of Naval Architects

INTERNATIONAL CONFERENCE ON INNOVATION IN HIGH SPEED MARINE VESSELS

28-29 Jan 2009, Fremantle, Australia.



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Second Announcement



Centre for Marine Science & Technology

Few sectors of the maritime industry have embraced innovation as readily and successfully as the high speed marine vessels sector, in seeking to extend operating envelopes, reduce downtime and increase reliability, safety and comfort, and reduce costs. Advanced design, the use of new materials and more efficient production methods and other means have and are all being explored to achieve these aims for commercial, military and recreational vessels.

The first International Conference on Innovation in High Speed Marine Vessels will provide an opportunity for all those involved with this sector of the maritime industry to present and discuss recent and future developments in all these aspects of commercial, military and recreational high speed vessels.

Technical papers are invited containing new and original ideas, innovative applications and practical achievements in various aspects of high speed marine vessels, including but not limited to the following topics:

- Design & Construction: including monohulls, multihulls, and special craft such as ACV, SWATH and hydrofoils.
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Dante's new life

New levels of redundancy for Italian owner with the delivery of *Dante A* from Astilleros de Huelva.

After some delay, Astilleros de Huelva was due to deliver the 12,000dwt (scantling) IMO Type 2 oil/chemical tanker *Dante A* (Hull 826) to Italian shipowner Amoretti Armatori Group at time of writing, the first ship in the owner's fleet to exhibit complete redundancy in terms of its propulsion and steering systems.

With two main engines, twin steering gear, two variable pitch propellers, and two rudders, the ship will offer new levels of dependability for the owner, in a configuration that will be replicated in a larger 15,000dwt oil/chemical tanker (Newbuild 827) from the same yard, due delivery by the middle of 2009.

As far as *Dante A* is concerned, main propulsion is coming courtesy of two 8L32/40 four stroke common rail main engines from Wärtsilä, each of which generates 3680kW of power.

Both ships will be deployed in the Mediterranean.

The addition of *Dante A*, whose design was model tested at HSVA, brings Amoretti's



Dante A - due delivery at time of going to press.

fleet of tankers to 16 ships. With a length overall of 119m, a breadth of 22m and a depth of 11.35m, this ship will feature three 360kW main generators, two 500kW shaft generators, and will achieve 14.8knots fully laden at 85% MCR, running on IFO 180 type fuel. Manoeuvrability will be enhanced using a single 650kW bow thruster.

Wärtsilä is also supplying the 4.5m diameter controllable pitch propellers, which operate at 115revs/min.

Classed by Rina, *Dante A* will offer 14,000m³ of capacity in 12 cargo tanks, offering six degrees of separation, plus two slop tanks. All cargo tanks are fitted with independent venting pipe and connection for vapour return ashore, as well as heating coils in stainless steel, Saab tank radar type auto level gauging, vapour locks, temperature and pressure sensors. All tanks, including slop tanks, come fitted with Hamworthy pumps, each capable of handling 250 m³/hr of materials.

Dante A also features two 5tonne SWL electro-hydraulic cargo handling cranes from Contento.

The ship is classed C + Oil Tanker - Chemical Carrier, ESP Unrestricted Navigation + Star Hull + PMS + AUT-UMS + AUT-IMS + AUT-PORT + AVM-APS, Clean Sea, Clean. **NA**

Bigger is better for Vulcano

Larger product/chemical carriers due delivery from Vigo-based Factorias Vulcano.

As this issue of *The Naval Architect* was going to press, shipyard Factorias Vulcano was due to deliver the first of three 1A Super Ice Class product/chemical tankers to Russian owner Rosneft, via ship manager AB Sea Ltd.

The shipbuilder concedes that it has secured no orders during 2008, but the Vigo-based yard is nonetheless working through a number of complex projects which will see it delivering ships into 2010.

The first 30,200dwt ship for Rosneft, *Arkhanelsk*, was due delivery in November, with *Murmansk* and *Privodino* due respectively in January

and July 2009. These 176.1m long, 29.8m wide, by 14m deep ships are designed for the operation in Arctic seas and will be capable of navigating in the ice-covered waters with ice depth of more than one metre. *Arkhanelsk* is the first vessel built by Rosneft as part of its own tanker fleet.

These IMO2-type ships are also larger than the chemical carriers the yard has previously built. Classed by Det Norske Veritas, they will feature 12 cargo tanks, with capacity for 34,900m³, as well as 12 x 12 500m³/hr cargo handling pumps. They will be fitted with 10,800kW MAN B&W 9L48/60 main engines.

Factorias Vulcano also has three

seismic vessels under construction (*Blue Arrow*, *Blue Sabre*, and *PGS Apollo*), all for investors operating in association with the Arrow Seismic brand. These 3200dwt ships are 106.8m in length, 19.2m wide and 8m deep, and are due delivery between January and July 2009.

Also on order is a single 125.3m long, 4600dwt support supply vessel, *Polycastle*, due delivery to River View Shipping Co Ltd in April 2010, while a 15,702dwt chemical carrier, *Canneto M*, and a standard 21,450dwt tanker, *Vicuna*, are due delivery respectively to Augusta Due and Kanata Shipping Co before this year is out. **NA**

Newbuilding prospects take shape

Drydocks World Dubai is well on its way to establishing itself as the leading builder of ocean going tonnage in the Middle East. Other yards in the region also have newbuilding plans.

Drydocks World Dubai (DWD), formerly known as Dubai Drydocks, has made its name primarily as a shiprepair and conversion venture. However, the company has responded to the strong demand for vessel construction services by converting the northern part of the yard, covering around a third of its total area, into a newbuilding facility at a cost of more than US\$80 million.

The project, code-named Safina, has already yielded some positive results, with the delivery of anchor handling tugs, service boats and bunker barges for various clients in 2006 and 2007. The company has also completed construction work on two 16,500dwt semi-submersible steel hulls for Aker Kvaerner of Norway, with the second leaving the yard in May this year.

However, over the past 18 months DWD has started to move on from small boat building, to make the desired breakthrough into the market for larger, and more sophisticated vessels. The company's aim is that, in future, over 30% of turnover will be derived from the construction of ocean going tonnage.

Last year, DWD announced that it had concluded an agreement with Singapore-based Navig8 to build four medium range (MR) 50,000dwt product tankers, with an option for four more vessels, to a South Korean design. The deal was reported to be valued at US\$175 million and delivery is scheduled to take place between 2009 and 2010.

The original idea was that these ships would be constructed in Dubai. However, there are reports that a decision has been taken to switch the project to one of DWD's other South East Asian yards in either Singapore or Indonesia.

Instead, the Dubai yard is to focus initially on the construction of a series of eight, highly complex, 89m long seismic survey vessels, which will be built to an



Aerial view of Dubai Drydocks and the new Dubai Maritime City.

Ulstein design. Six of these ships have been ordered by a locally-based company, Polarcus, while two will be delivered to Western Geco, a division of the Schlumberger group. All will be classed by DNV.

This series are 3D seismic survey vessels and will feature Ulstein's new X-Bow design, along with other features including an additional SF class notation for controlled stability and floatability, diesel electric propulsion, dynamic positioning and the DNV Comfort and Clean class notations.

The new vessels have been designed to meet the most challenging offshore projects and operating conditions, and close attention has been paid to system redundancy and clean air emissions. Advantages over conventional designs are said to include higher transit speeds

in head seas, reduced power consumption and greater fuel efficiency. The X-Bow concept is also intended to offer reduced noise and vibration levels as there is no bow flare. All the vessels will be equipped with the latest seismic technology, including solid streamers, digital gun controllers and the latest navigation and positioning systems.

It is expected that DWD will deliver the first of these seismic survey vessels in mid- 2009, with the last in the series following in July 2010. The keel laying of the first two Polarcus ships took place in September and October this year and at the time Peter Zickerman, executive vice president for Polarcus, said: "This is a major milestone in the construction of our fleet and I am pleased that the work on the two vessels is progressing well and most importantly to schedule."

The Polarcus ships will, in fact, be of three slightly different types. Four of the ships will incorporate 12 streamers, and will include two each of the Ulstein SX124 and SX134 designs, while two will be built to the 6 streamer SX133 configuration.

The first phase of DWD's Safina project to expand and enhance newbuilding capability started in September 2006 and included the installation of a hydrolift system designed to offer a cost effective way of moving ships, and ship sections, from a fabrication facility at ground level to sea level without the need for slipways or shiplifts. The main use of this facility is to transfer large sections of hull from land to sea, and then to drydock for final assembly. The hydrolift system can handle hull sections up to 120m x 60m in size.

DWD's newbuilding facility is designed to construct vessels, or parts of vessels, to a maximum size of 120m x 60m x 30m and weighing up to 15,000tonnes.

The facility is equipped with an automated panel line, which can produce panels up to 16m² in size and weighing up to 100 tonnes, and which covers an area of 6,400m². The workshop is equipped with frame bending, profile cutting, and cold forming machines, as well as three plasma cutting units. Additionally, DWD has a heavy duty steel plate rolling machine that has the capacity to roll steel plates up to 115mm thick.

A 300tonne gantry crane covers the

16,500m² main assembly area while crawler and mobile cranes service the 14,400m² panel assembly area. Further investment has been made in an air-slide heavy load transfer system, which can move loads up to 8000tonnes within the yard, and DWD believes it is the only yard in the Middle East with this technology.

High demand for newbuildings encouraged DWD to push on with phase two of the Safina project at an accelerated rate, and this is now nearing completion. The project has included the demolition of office buildings and warehouses to make way for new workshops and assembly areas, and some land reclamation. Furthermore, the newbuilding project has created a need to increase the size of the yard's workforce quite considerably, and this has required the building of a new accommodation area with space for 4000 persons, which is expected to be ready by the second quarter of 2009.

DWD has also erected a new engineering office building to house engineering and project management associated with the newbuilding division; additional enclosed painting and blasting sheds; stores for newbuilding components, and further steel fabrication areas with high capacity overhead cranes. Also part of the project is a new compressor house, designed to provide an additional 14,000ft³ per minute at 9.5bar of compressed air, which is located adjacent to the newbuilding

facility. This supplies compressed air to the new blasting and painting sheds as well as the steel fabrication facilities.

DWD's investment in the newbuilding area is intended to provide the basis for a significant newbuilding business in Dubai. The company believes it can compete in the market for product tankers and small to medium containerships, as well as sophisticated offshore vessels such as the current seismic survey series.

DWD also has a yacht building operation, Platinum Yachts, which completed the 163m long mega Yacht My Dubai, last year. Soon to move to the adjacent Dubai Maritime City, which is being developed on reclaimed land, Platinum Yachts is expected to focus on the building of 80m long luxury yachts in future.

Other interests

The UAE is also the base of a number of other shipbuilding ventures, but these mainly focus on smaller vessel types, such as tugs, service boats and local ferries. The Jadaf based company Albwardy Marine Engineering is now 49% owned by Damen of Holland following a deal signed earlier this year and this joint venture has resulted in a continuous flow of newbuild orders. Currently AME has a total 20 workboats and dredgers of various sizes under construction. Another Jadaf-based boat builder is Grandweld, which is active in similar market areas. Both Albwardy and Grandweld will relocate to Dubai Maritime City in 2009-10, as Jadaf is to be closed down, and this should allow them to build larger boats in future, as the new site will have much greater shiplift capacity, up to 6000tonnes, available.

One of the fastest growing small boat builders is Nico Craft in Fujairah, a subsidiary of the Nico International group, which specialises in the building of aluminium monohulls and catamarans to designs supplied by Teknikraft and Incat Crowther. The company is building a series of 35m crew boats for various customers and one of its most recent contracts is an order for five such vessels for the national oil company of Azerbaijan.



Abu Dhabi Shipbuilding's facilities.



Polarcus ships will be built to the Ulstein X-Bow design.

In Abu Dhabi, Abu Dhabi Shipbuilding (ADSB) is primarily engaged in the building of military craft and is in the final stages of building its first Baynunah class corvette for the UAE Navy, which has contracted ADSB to build six ships of this type at a cost of over US\$1 billion. The first of the 72m long corvettes to be built at the yard is expected to be launched by the end of the year.

ADSB has also been awarded a contract to build 12 patrol boats for the UAE coastguard. These 34m long vessels will be manufactured using composite materials, and will be laminated at ADSB's new composite building hall, which has recently

been extended with a dedicated 4800m² composite outfitting workshop.

One of the biggest yards in the Middle East Gulf region, and one with perhaps the greatest long term potential to emerge as a regional shipbuilder to compete with yards in Asia, is ISOICO of Iran. The company is reported to have orders for six 2200TEU containerships and six 74,600dwt panamax tankers for IRISL, as well as two 35,000dwt product carriers for the National Iranian Tanker Company (NITC). However, local sources suggest that financial problems have constrained ISOICO's ability to make progress with these projects as yet, and their ultimate status is unclear.

Similarly, Iran Marine Industries' Sadra yard on the Caspian Sea appeared a in 2005-6 to be making a breakthrough in the international arena, with orders for three 63,000dwt product tankers for NITC, to a Komac design, as well as series of heavylift ships and LNG carriers for Rickmers and Exmar respectively. However, none of these vessels has yet been built due to the financial problems which have beset the yard. Sadra's biggest project, an oil rig for Caspian Sea operations, is finally nearing completion after a newbuilding programme that has lasted seven years, with major delays due to financial issues.

If sanctions against Iran are eased, and yards such as Sadra and ISOICO can access financing to support these major newbuilding projects, then both yards could emerge as important regional players. The basic infrastructure is in place and the support of domestic companies like NITC and IRISL could provide the platform required to establish series production of deep sea vessels. **NA**

Work in progress on a Polarcus ship



The Royal Institution of Naval Architects

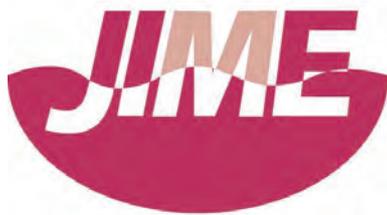
International Symposium on Ship Design & Construction 2009 – The Environmentally Friendly Ship

1 - 2 September 2009, Mitaka, Japan

First Notice & Call for Papers



Growing international concern over the environmental impact of the shipping industry presents new challenges to designers, builders and equipment manufacturers. The International Symposium on Ship Design & Construction 2009, organised by the Royal Institution of Naval Architects, the Japan Society of Naval Architects and Ocean Engineers, the Japan Institute of Marine Engineering and the Japan Institute of Navigation, will address the interdisciplinary technologies which are required to provide the environmentally friendly ship of the future.



The growing international concern and regulations about the environmental impact of the shipping industry means that designers, builders and equipment manufacturers will have to develop new ship technologies to cope with the demand for reducing fossil fuel based consumption, minimising CO₂, NO_x, SO_x emissions, reducing the environmental impact caused by ballast water discharge, etc. ISSDC 2009 will provide an opportunity for interdisciplinary presentation and discussion of these new technologies by all engineers that are interested in environmentally friendly ships. Papers are invited on the following topics:



- Increasing hull efficiency: hull optimization, ship performance in actual seas, bubble, hull coatings, weight reduction
- Improving propulsion: advanced propeller design, improved propeller hull interaction, propeller-rubber combinations.
- Increasing machinery efficiency: improved engine performance, better power management, energy saving device, waste heat recovery.
- Alternative propulsion methods: fuel cell, solar, wave, wind, LNG, hydrogen.
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- Environmental impact: Ecological impact, ship recycling.
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Fuel cell ship in the real world

The first passengership with a fuel cell propulsion system for commercial operations has been launched and will be operated by ATG.

Though much smaller than the ships generally covered by this magazine, at just 25m in length, in the context of a feature on inland vessels *The Naval Architect* feels it would not be appropriate to overlook the entry into service of the world's first passengership to operate commercially using propulsion drawing on fuel cells.

Operating on the Alster lake in Hamburg and surrounding canals since the beginning of September, the 100-passenger capacity FCS ('fuel cell ship') *Alterwasser* is the result of the Zemships (Zero Emission Ships) project, a joint effort involving nine industrial partners and headed by the Ministry of Urban Affairs and Environment of the City of Hamburg.

The overall dimensions of the ship are as follows: 25.5m in length, 5.2m beam and 2.62m in height.

The Zemships project started in 2006 and attracted €2.4 million by way of European Union funding, with the partners involved contributing a further €3.1 million.

Alterwasser, constructed by the SSB Oortkaten shipyard, is operated by Alster-Touristik GmbH (ATG), which also came up with the draft design for the vessel.

The Zemship runs on an innovative hybrid fuel cell drive technology produced by Proton Power's wholly owned subsidiary, Proton Motor Fuel Cell GmbH. To date, fuel cell systems of equivalent performance levels in maritime applications have only been applied to military submarines.

The hybrid unit integrates two Proton Motor 48kW fuel cell systems and a lead gel battery. The 96kW output means that the ship can cruise at speeds of up to 15km/hr.

A proprietary intelligent energy management software balances the power output across the fuel cell storage unit(s) to maximise efficiency and improve power delivery. The system thus boasts lower fuel consumption and more consistent levels of power delivery than conventional diesel/combustion engine



Alterwasser: the world's first fuel cell-driven passengership to enter commercial operations.



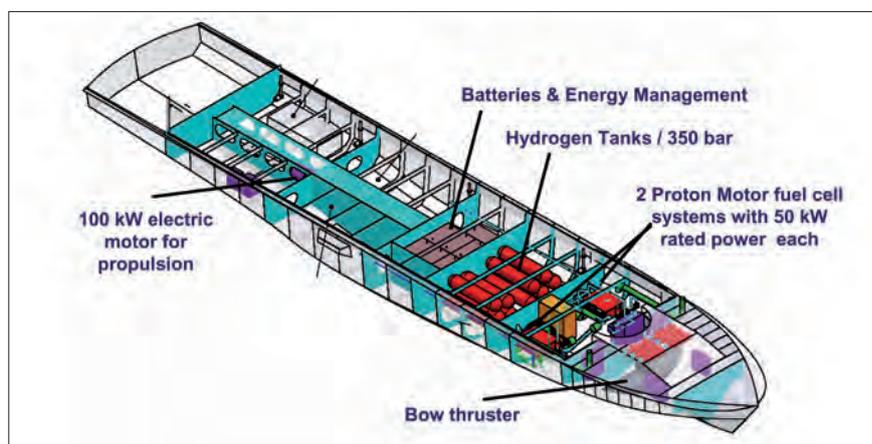
Enjoying the occasion, from left to right, Gabriele Müller-Remer, managing director of Alstertouristik GmbH, Wolfgang Tiefensee, Minister, Federal Ministry of Transport, building and Urban Affairs, Günter Elste, chief executive of Hamburger Hochbahn AG, Anja Hajduk, Senator of the City of Hamburg, and Jens Wrage, managing director of Alstertouristik GmbH.

or fuel cell-only systems, according to its developer, in addition to producing zero harmful emissions. The power system has been certified for maritime operations by Germanischer Lloyd.

The fuel cell hybrid system uses up to 50kg of gaseous hydrogen stored in onboard tanks, sufficient to provide fuel

for around three days' use.

Following the commencement of operations, technicians are collecting information on the performance of the hybrid zero emission drive, to identify areas of improvement and to feed into Proton's ongoing commercialisation programme.



Schematic of the zero emission ship.

After a test phase, the ship operator will gradually take the ship into commercial service before the year is out.

To put the environmental side of the story into context, it is worth considering that the operation of an equivalent inland ship would see the annual emissions of 1000kg of NO_x, 220kg of SO_x, 40kg of particulates and 72,500kg of CO₂. Using

a fuel cell-based propulsion system, all of these figures fall to zero.

Thomas Melczer, Proton Power Systems chief executive, said: "The launch of the ZemShip marks a significant milestone for Proton Power and is a testament to the potential that our fuel cell technology has in helping to reduce and even eliminate emissions in maritime transport.

Eco-tankers underway

Work is underway in China on the construction of two hulls that, once they have been transported to The Netherlands, will be fitted out as new generation 'eco-tankers' for operation as refuelling vessels in the Port of Rotterdam.

IHDA Shipbuilding Service BV has been responsible for the design of a new pair of, 7164m³ capacity 'eco-tankers' which, after hulls are delivered from China, will be completed at its Krimpen aan de Lek yard for shipowner Amulet - owned by the Jansen family. Their configuration will be distinguished by the inclusion of an innovative diesel electric propulsion system, with five Volvo Penta D16 gensets being placed in the bow, giving very low noise on the bridge and 5% extra load capacity.

Stringent emission regulations and high demand for fuel efficiency are behind the development of these tankers.

Hitherto, Europe's inland tankers have featured conventional diesel engines in combination with gearboxes and propeller shafts but, in the case of the eco-tanker, the five gensets are used for all onboard power

needs, driving two rudder propellers via cables, two propulsion thrusters, a bow thruster and electrical power for pumps, etc. As noted in last month's *The Naval Architect Marine Power and Propulsion* supplement (p24), engines can be operated individually and at peak efficiency. While sailing unloaded, or downstream, one or more engines are automatically shut down to save fuel, without reducing performance.

IHDA managing director Jan Dane said that, because the vessels would be operating over relatively short distances, there was no need to install two main engines that would rarely be called upon to operate at full load. A power management system would determine full power to operate all five gensets, where the operation of 20 Marflex cargo pumps could be achieved efficiently running only a pair of gensets.

"Marine passenger transport is just one of the many applications for our fuel cell systems."

Dr. Gerd Würsig, fuel cell specialist at Germanischer Lloyd, said: "Introducing fuel cell technology onboard a passenger ship is not an issue. The ship is constructed [to] the high standards of GL. Passengers will hardly realise any differences to a conventional ship - they will only be surprised by its tranquility."

A hydrogen refuelling station has been constructed and designed by the Linde Group. Dr. Aldo Belloni, member of the board of directors of the Linde Group, said: "Being a part of the cutting edge of development in hydrogen technology we strive to implement an environmentally friendly mode of mobility for all sectors. By operating this hydrogen refueling station for FCS *Alsterwasser* we demonstrate the outstanding properties of hydrogen as fuel for passenger ships."

FCS *Alsterwasser* is also equipped with a roof lowering device, allowing it to pass the low bridges separating the Alster lake and the Elbe lake. [NA](#)

Mr Dane said that the first hull would be delivered to IHDA for outfitting in the Autumn of 2009. [NA](#)

TECHNICAL PARTICULARS

Eco-tanker Technical data

Length:.....	135m
Width:.....	14.15m
Draught:.....	6.17m
Capacity:.....	7.145m ³
Main engines:.....	5 x Volvo Penta D16 MG
Propulsion:.....	2 x 850kW pods
Pumps:.....	20 x 52kW
Bow thruster:.....	1 x 550kW
Classification:.....	Lloyds Register of Shipping Harbour/emergency
pgenset:.....	1 x Volvo Penta D5 TA

Neglected sector gets new PLATINA

Plans for Europe's inland waterway network include new research and development on vessel design.

On 1 October 2008, the European Commission launched "PLATINA", a new initiative aimed at promoting inland waterway transport.

Like many a Commission initiative, PLATINA exhibits high ideals but is short on detail.

Nonetheless, it is worth noting that the project brings together 22 partners from nine European countries, and is funded with €8.5 million from the Commission. It is seen as the lever through which the January 2006 initiative 'NAIADES' (European Action Programme for Inland Waterway Transport) will be implemented. NAIADES includes recommendations for action to be taken between 2006 and 2013 by the European Community, its Member States and other parties concerned with inland waterway transport.

NAIADES is said to set the framework for a comprehensive inland waterway transport policy by focusing on five strategic interdependent areas:

- Markets
- Fleet
- Jobs & Skills
- Image
- Infrastructure

PLATINA's core consortium, meanwhile, is formed by via donau (Austria) as coordinator, Voies navigables de France (France), Bundesverband der Deutschen Binnenschifffahrt (Germany), Promotie Binnenvaart Vlaanderen (Belgium) and the Rijkswaterstaat Centre for Transport and Navigation (The Netherlands).

According to Dr Gert-Jan Muilerman, of via donau, and PLATINA policy implementation team manager: "Despite the fact that PLATINA does not deal with research and development itself, PLATINA will have an important role in getting and keeping inland waterway transport on the agenda: inland navigation has long been practically neglected, not only in the area of research and development, but especially also in terms of funded research programmes.

Lacking funding programmes, combined with a sector that is characterised by SMEs, [means] long-term and structural innovation can only be limited. The innovation expert PLATINA group within PLATINA will try to change that for the better; PLATINA will create better framework conditions for further development in this area.

"Short term, PLATINA is aimed at disseminating knowledge on funding opportunities and subsequently pushing further innovations in the sector (especially in the field of shipbuilding)."

"Inland navigation has long been practically neglected, not only in the area of research and development, but especially also in terms of funded research programmes"

According to PLATINA project documents, research and development in shipbuilding (e.g. vessel design, use of materials, hydrodynamics), ship machinery (e.g. engines, fuels, alternative propulsion, ship equipment) and innovations in logistics (loading units, transshipment equipment) "should be aimed at maintaining inland navigation's head start in terms of logistics efficiency and environmental performance". Although many different research and development activities have taken place in the field of inland waterway transport (IWT), the EC now says that a systematic

collection, analysis and dissemination of research results is "currently lacking".

"Experiences and existing knowledge are not disseminated in a structured manner. Knowledge on fleet innovations, transshipment equipment and new logistics concepts is dispersed over many different sources. This results in inefficiencies in the development of new technologies, increased development efforts and a limited market transfer of research results."

While technical research and development of new fleet concepts is beyond its scope, PLATINA is aimed at supporting innovation and disseminating the results of existing research to a broader audience.

This includes a sub-work package, which will detect and gather existing research results and innovations that might contribute to "an improved economic, safety and environmental performance of IWT".

The IWT innovation expert group will, apparently, "act as an interface between market demand on the one hand and the need for further and future R&D activities on the other".

The expert group will consist of about 15 key experts. Its members shall represent the different river basins and the corresponding fleet requirements considering the local market demands and the specific infrastructure conditions of the respective waterways. Furthermore, preliminary investigations will be undertaken by the expert group to identify existing (inter) national innovation schemes, relevant research activities and existing innovations related to IWT.

Amongst other things, this will cover aspects such as engine and propulsion technology, safety issues in the trend towards scale increase, effects of fuel price developments, climate change and better exploitation of existing infrastructure, double hull technology, or opportunities for further automation on board, the project leader said.. **NA**

Funding for the modal shift

New opportunities for the transfer of freight from road to inland waterways include extensive grants to develop and enhance vessel designs.

European authorities have this year made a priority of extending new funding to encourage modal shift from road to Europe's inland waterway network.

In the latest such move, in July the EU approved the extension of an Austrian funding programme for the development of intermodal traffic and for the funding of combined transport projects on the Danube waterway, which had ended in 2005. Upon strong lobbying efforts on the part of Austrian Ministry of Transport subsidiary via donau the new programme is making €1million available to companies interested in developing new intermodal services based on inland waterway transport.

This measure, which aims at stimulating a modal shift from the country's roads to the Danube by encouraging innovative solutions, happens to coincide with the launch of regular liner services in the sectors of ro-ro and container transport. The funding scheme is deemed particularly important because it will not only reduce the start-up risks of new innovative services, but also because inland waterway transport will be helped to operate on an equal footing with the railway transport of containers and trailers. The approval of the pilot programme inscribes itself in the Austrian government's policy of the past decade of supporting the modal shift from the road to other environment friendly transport modes and therefore is a milestone in the promotion of inland waterway transport in Austria.

The programme, which will run from 2008 to 2014 and will be targeted at new, high-quality intermodal services for navigation on the Danube. Aid will be given in the form of an environmental premium of between €18 for 20ft containers / swapbodies and €34 for 40ft and 45ft containers / swapbodies and trailers. The premium will be granted upon presentation of a business plan showing that the intermodal inland



Intermodal incentives on the Danube, by order of the EU.

navigation service in question will be of a high quality and in regular operations.

Earlier this year, the European Commission gave the green light to a French aid scheme for inland waterway transport. The scheme, which has an overall budget of €16.5 million and will run from 2008 to 2012, is designed to boost inland waterway transport in France by modernising the fleet and promoting the occupation of inland waterway carrier.

The scheme proposed by the French authorities follows on from the inland waterway scheme for the period 2004-07. It includes aid designed to ensure a better response to current market conditions.

Aid will be allocated for environmental measures, fleet modernisation, improved safety and the commissioning of vessels which can also call at sea ports. The scheme is also designed to promote and revive the occupation of inland waterway carriers and to facilitate investment in new information and communication technologies.

Part of the aid is aimed at modernising the fleet and improving its capacity for carrying specific goods in order to meet the needs of shipping agents and industry, while at the same time enhancing its environmental credentials. Improving the technical features of vessels will thus help save energy and reduce pollution, it is said.

A programme with similar aims has been authorised in the Czech Republic, where an aid scheme has been extended to operators of inland waterway freight transport vessels. In this case, a total of CZK443.5 million (€17.33 million) in aid is being made available, which will be co-financed from the European Regional Development Fund.

Here too, the objective is partly a vessel modernisation programme, to make more effective use of vessels, to raise the transport safety level and to reduce impact on the environment. The scheme includes three specific sub-programmes:

- aid for purchase of low-emission engines, which will incentivise companies to upgrade to ships following the latest EU standards;
- aid to investment in transhipment equipment, which will make vessels more competitive and operationally flexible, so as to support intermodality;
- aid for investments into appliances to increase navigation safety and improve manoeuvrability.

In line with its general policy approach and the applicable legislative instruments, the Commission has concluded that any distortion of competition through the notified aid is outweighed by its contribution to objectives of common EU interest. **NA**

Cleanest ship operates inland

EU-funded research project demonstrates a low-emission, fuel efficient tanker, developed to reduce the environmental impact of inland shipping.

The average CO₂ emissions generated by vessels using Europe's inland waterways is reckoned to be one third of the equivalent road transport in per tonne-kilometre terms, but sulphur oxide (SO_x) emissions are actually much higher than those resulting from road transport, because of the higher sulphur content of the fuel used by ships.

While stricter emissions limits for road transport have been in place since the early 1990s, significantly reducing nitrous oxide (NO_x) and particulate matter (PM) emissions, such tough limits have not yet been applied to inland navigation.

The EU's Sixth Framework Programme (FP6) CREATING – 'Concepts to reduce environmental impact and attain optimal transport performance by inland



Victoria - the demonstration inland tanker billed as the 'Cleanest Ship'.

Inland AIS receives type approval

Saab TransponderTech's R4 Inland Automatic Identification System (IAIS) has become the first technology to receive type approval from Fachstelle der WSV für Verkehrstechniken as meeting new requirements for operation on European waterways.

The R4 IAIS is based on Saab's proven Class-A AIS transponder hardware and software, but has been enhanced for inland navigation requirements. In addition to standard AIS messages, the IAIS broadcasts information such as Blue Sign status for upstream or downstream navigation; hazardous cargo carriage (Blue Cones); and estimated time of arrival at locks, bridges and terminals. Vessel draught is transmitted with centimetre-level accuracy. The system also displays data such as water levels and recommended time of arrival transmitted from shore AIS base stations.

Saab has already supplied a number of Inland AIS transponders for use on the Danube in Austria.

Saab TransponderTech was an early exponent in the development of AIS technology. The company has delivered more than 12,000 shipboard AIS transponder systems and 1500 shore AIS base stations around the world.



Saab has already supplied a number of Inland AIS transponders for use on the Danube in Austria.

navigation' – project set out to improve both the logistics and the environmental performance of inland waterway navigation.

The CREATING team comprises 27 partners from nine countries and deals with the Rhine and Danube basin, the North-South connection from The Netherlands to France, and the East-West canals such as those in Germany and Poland. The team includes research institutes, shipyards and relevant branch organisations – such as shippers and inland navigation.

The project team proposed the application of low sulphur fuel, speed control, selective catalytic reduction and particulate matter filters.

The result was the 'Cleanest Ship Project', a one year demonstration project which is due completion in November 2008.

In co-operation with oil multinational BP, the project saw the modification of the 1300tonne, 70m long motor tank vessel *Victoria*, which operates around the Port of Rotterdam and Antwerp areas. The vessel is managed by Verenigde Tankrederij (VT) and on long term charter to BP Marine Lubricants.

The work aimed to:

- Cut NOx emissions by 92% by injecting urea into the exhaust stream;
- Reduce particulates by 98% using a regenerating filter system that burns off clogging material; and
- Eliminate SOx emissions by changing from conventional fuel oil used on inland waterways with a sulphur content of 1000 parts per million to an ultra-low sulphur fuel oil equivalent to standard road diesel.

Intelligent operating

A specially developed navigation system was deployed to help to optimise operations, cutting down fuel consumption and thus CO₂ emissions. The 'Advising Tempomaat' (ATM), developed and supplied by Techno Fysica (NL), is a system enabling an economically optimised operation of a vessel. The core of the system is a computer programme advising the skipper on the most economical combination of route and speed, enabling the vessel to arrive on time with a most efficient use of fuel, leading to reduction of fuel consumption and emissions. The ATM, where the advised fuel settings are realised manually, is the successor of the Tempomaat

which automatically adjusted the vessel speed, without giving advice.

By using the Advising Tempomaat, fuel consumption (FC) may be reduced by up to 15% for longer distances. For this demonstration project, however, a more moderate reduction was achieved, due to the small operational area of the vessel and frequent manoeuvring in harbours.

Meanwhile, *Victoria* uses low sulphur fuel equal to road standard diesel fuel (EN 590), supplied by BP. Combustion of low sulphur fuel is a precondition for application of particulate matter filters (soot filters) and for efficient reduction of SOx emissions, which are directly related to the sulphur content of the fuel used.

Dealing with particulate matter is the Nauticlean S system, developed and built by Hug Engineering, which encompasses a PM (soot) filter and selective catalytic reduction (SCR) catalyst in the same reactor. The filter is equipped with a diesel full-flow regenerative burner.

Selective catalytic reduction is a technique for efficient removal of NOx emissions by means of injecting a reducing agent into the exhaust gas. The Nauticlean S system uses

ammonia to reduce nitrogen monoxide and nitrogen dioxide to nitrogen and water, which is injected as urea (33 % solution). For PM removal catalytically coated silicon carbide (SiC) particulate matter filters are used, consisting of several honeycombs made of micro fibres.

During operation, soot particles are retained in the filter. As soon as the regeneration temperature is reached, the soot is burned off without residue. Due to the catalytic coating, the regenerating temperature is around 450degreesC. The filter burns itself clean without requiring auxiliary energy. The full-flow regeneration burner system ensures independent and reliable regeneration of the filter even at low exhaust gas temperatures and in long low-load and idling phases.

Fuel consumption and NOx emissions are being measured directly; CO₂ and SOx emissions are calculated from fuel consumption, while PM emissions are evaluated using the emission-reduction potential estimated from initial tests. The latter is necessary because accurate measurement of PM emissions in service conditions is difficult. **NA**



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

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9th International Conference on High Performance Marine Vessels

Organised by:

The Royal Institution of Naval Architects (RINA)
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Ship Design Academy Committee (CSNAME)
China Boat Industry & Trade Association (CBITA)
17 -18 April, 2009 Shanghai, China

First Notice & Call for Papers

Supported by:

China Society of Naval Architects and Marine Engineers (CSNAME)

China Association of National Shipbuilding Industry (CANSI)

Over 500 papers have been presented and published in both Chinese and English at the annual China International Conference on High Performance Marine Vessels, which is now in its 9th year and which has become an important forum for the discussion of technical and scientific matters relating to high performance marine vessels in both the Chinese domestic and international markets.

High performance marine vessels for both commercial and recreational use continue to be developed to meet a wider range of roles and more demanding operating conditions. The high speed maritime industry is seeking to extend its operating envelopes, reduce downtime and increase reliability, safety and comfort. The use of new materials and more efficient production methods are being explored to reduce costs.



HPMV China 2009 will again bring together representatives of the international maritime industry and academia to present and discuss developments relating to a wide range of high performance marine vessels, including small planing craft, paramilitary vessels, passenger ferries, freight carriers and recreational craft. Monohull, multihull, ACV/SES/WIG/HYF, and novel hull designs will all be covered.

The Conference will present papers on the following topics:

- Hydrodynamics
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- Design and production technologies
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- Safety, Regulation and Classification
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NAVAL ACCIDENTS since 1945

Review by E. C. Tupper

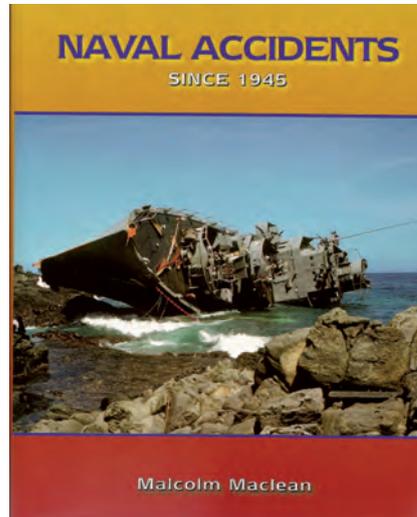
NAVAL ACCIDENTS since 1945

By Malcolm Maclean, published by Maritime Books as a hardback, 2008, 449 pp. ISBN 978 1 904459 32 3, £30.

The author is a serving Marine Engineering Officer in the Royal Navy. He has served in a wide range of warship types. He opens by stating that since 1945, peacetime accidents have resulted in hundreds of naval vessels being lost or declared beyond economical repair. In some cases they have also resulted in heavy loss of life. He does not cover ships lost in action in the various wars which have been waged in this period.

The author has drawn upon over 500 sources in over 50 countries, including personal accounts from those involved. The book is well illustrated with photographs many of which have not been published before. Many show the vessels after the incident. In all it represents a sobering account of the dangers faced by those who venture on the sea. It is only when these incidents are drawn together, and reported in one place, that the number and seriousness of these accidents can be appreciated. For instance, three serious collisions between aircraft carriers and escorts acting as plane guards are reported which resulted in a total loss of life of 332 persons. On average one submarine has been lost each year since 1945. Many of the incidents are recounted in some detail, and the outcomes of courts martial are given, which assists the reader in deriving valuable lessons from such tragedies.

Many losses in the immediate post-war years were of ships and craft built during the war when, necessarily, relatively inexperienced labour was used, there was great pressure to build rapidly and new techniques were adopted – much more welding and prefabrication of units. Such craft had been worked hard during the war with little chance of proper maintenance so they were



more likely to be lost in heavy weather than ships built in peacetime.

The book is instructive in that the author gives a number of detailed accounts of naval procedures intended to mitigate the effects of any incidents, for instance, in damage control and submarine escape and rescue procedures. In the latter case an interesting history of the development of these procedures is given. He also gives the background to some of the more unusual and dangerous substances used in submarine weapons, both for propulsion and as warheads, which helps the reader understand the sequence of events that led to a tragedy. For instance, the loss of H M S/M *Sidon* in 1955 and of the Russian submarine *Kursk* in 2000. In the case of submarines the different risks associated with different nuclear and other air independent propulsion systems are discussed. As in so many areas of engineering, there is often a trade off between safety and performance which the designer faces. How much weight and cost can be justified for systems designed to reduce the risk of, or consequences of, accidents is debatable but where human life is at risk the tendency should be to err on the side of safety. Unfortunately that has not always been the case.

Most accidents involve some element of human failing - usually a sequence of events each minor in its own right. These may be due to inexperience, inattention, complacency, errors of judgement or

simply incompetence. This underlines the importance of good training, in-service exercises and user friendly systems. Once an accident has occurred there is often very little time for those responsible to make decisions upon which survival of the ship and its crew depend. Particularly in submarines this may be measured in minutes rather than hours. The more experienced the crew, particularly the officers and senior ratings, the more likely it is that those initial decisions will be good. The designer can help considerably by providing inherently stable, well subdivided hulls and reliable systems with emergency back-up.

The book has ten chapters, each dealing with a different type of accident. They are classified as the force of nature; fire and explosion; groundings; collisions; material and structural failures; shipyard and dockyard accidents; ammunition and weapons incidents; mistaken identity and friendly fire; cause unknown and survival, escape, rescue and salvage. An appendix lists the accidents in chronological order.

Many of the lessons to be learnt apply equally to the merchant mariner as to naval personnel, although naval vessels run extra risks. For instance, on exercises they often operate with no lights showing whilst at high speed in the dark. However, they are not unique in carrying dangerous substances – dangerous to the ship and the environment. Many of the incidents described show how often old lessons are forgotten with time but others show the danger of introducing new concepts before proper evaluation. Yet others show basic shortcomings in procedure – a cruiser which sank when floated out of dry dock because the sea cocks were left open. That may be extreme but who of us can say we have never been guilty of a lapse in common sense?

The book can be recommended to all those involved in designing, building and operating ships as it shows how important detail design, selection of materials, maintenance of equipment, training and regular exercises can be when a crisis occurs. It contains many valuable lessons for us all. **NA**

The Principles of Navigation

Reviewed by Hugh O'Mahony

**The Principles of Navigation,
Admiralty Manual of Navigation
Vol 1**

Tenth Edition 690 pp ISBN 1 870077 90 3 - available from The Nautical Institute, price £90 plus postage and packing. Discounts for members of The Nautical Institute and bulk purchasers.

A revised and updated book for navigators has been published on its 100th birthday – the tenth edition of the UK's Admiralty Manual of Navigation Vol 1.

The authoritative work has been brought up to date by author Lt Cdr Alan Peacock of the Royal Navy who details the use of satellites and electronic equipment such as ECDIS in this edition, which is published by The Nautical Institute.

Without expertise in navigation, ships cannot be kept safe, Admiral Sir Jonathon Band, First Sea Lord and Chief of Naval Staff points out in the foreword to the book. "As naval operations, international container logistics and energy supply systems become more globally interdependent, the consequences of any navigational accidents become greater," he says.

The Royal Navy first published the Admiralty Manual of Navigation in 1908. While forming the basis of Royal Navy navigational training, the books have achieved more by defining effective practices for all mariners.

The comprehensive new edition will benefit all mariners whether on naval ships, commercial vessels, or leisure craft.

Lt Cdr Peacock adds: "This new book retains all the fundamental 'Principles of Navigation' so that mariners who rely on the computer-powered equipment found on ship's bridges today can turn to an authoritative source for support. Without

a resource like this, mariners are at the mercy of whatever software happens to be fashionable at the moment"

He has also considered the format of the book. "Finding information in manuals is not always easy. So when writing this manual, I divided the text into bite-size chunks. Every technical term has been italicised and included in the index."

The 2008 edition provides clear definitions and practical procedures and techniques for navigating ships in the widest oceans to the narrowest channels. Underpinning all this is a thorough mathematical explanation of the Earth's geodesy and its impact on charting, positioning and movement on this planet.

This combination of the practical and the theoretical will enable mariners to plan and execute the safe navigation of ships day by day at sea, as well as to understand and assess the validity of the ever more complex electronic systems used to conduct that navigation. **NA**

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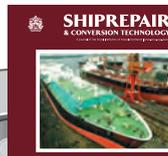
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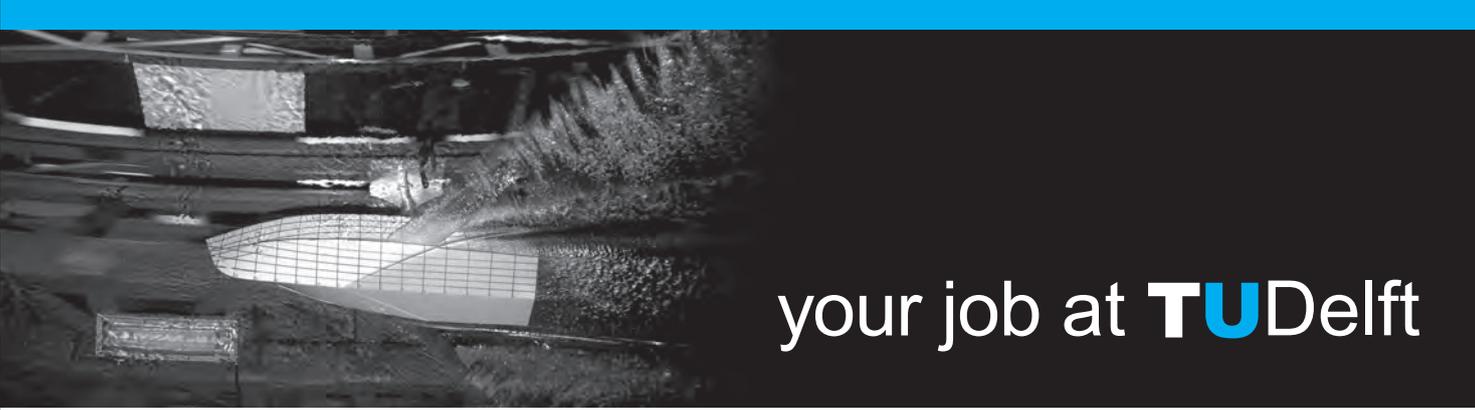
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Delft University of Technology is the only university in the Netherlands offering education and research in the field of Marine Technology. The Department of Marine and Transport Technology at TU Delft has so far been very successful in participating in both national and European collaborative research projects. Several new funding schemes have been initiated recently by the Dutch government to stimulate cooperative research in the field of offshore shipping and shipbuilding. Given the leading position of the Dutch shipbuilding industry, there is ample opportunity to focus on education and research related to the design, construction and operational use of large sailing and motor yachts, fast patrol ships, high tech offshore vessels and ships for inland waterways.

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For more information, please contact Hans Hopman, e-mail: J.J.Hopman@tudelft.nl or Rene Huijsmans, e-mail: R.H.M.Huijsmans@tudelft.nl To apply, please send a detailed curriculum vitae and your motivation for a specific position to: Application-3mE@tudelft.nl by January 5, 2009 indicating vacancy number 3ME08-45.

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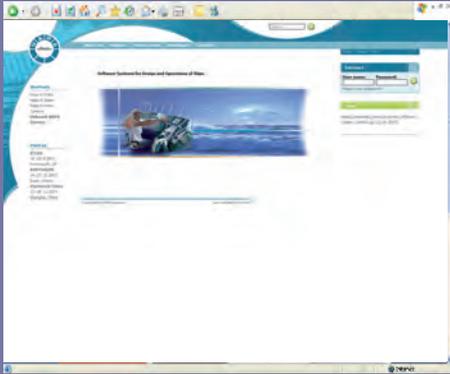
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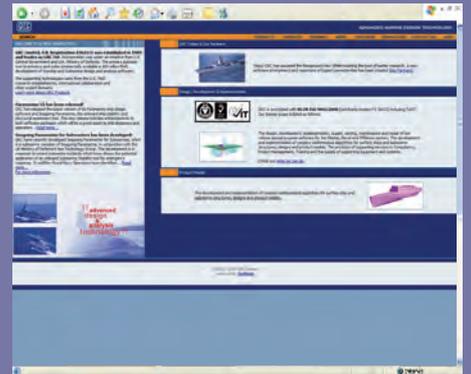
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