



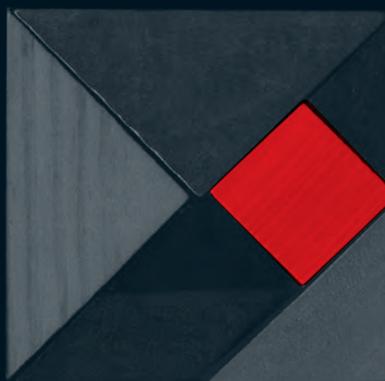
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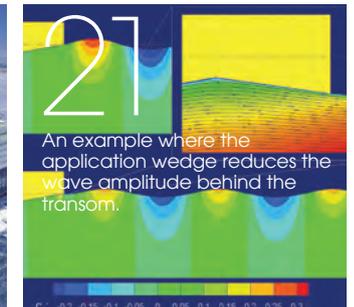
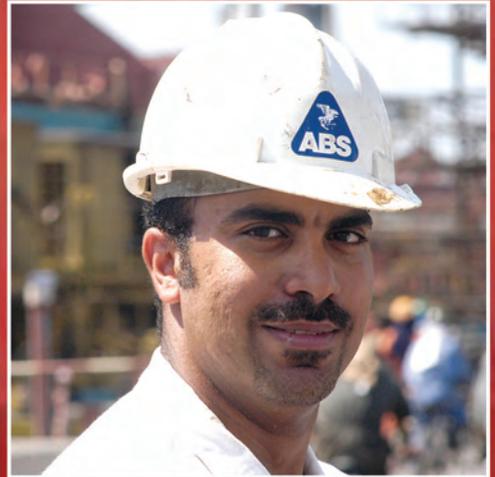


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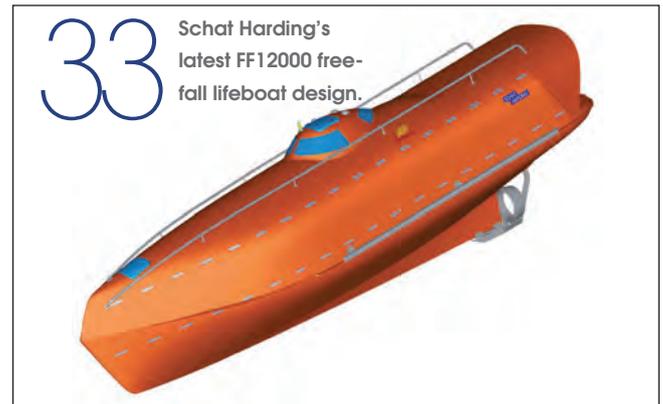
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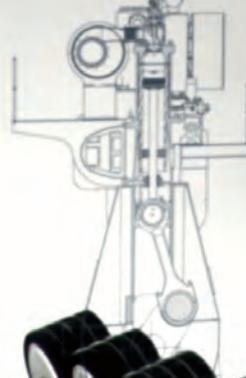
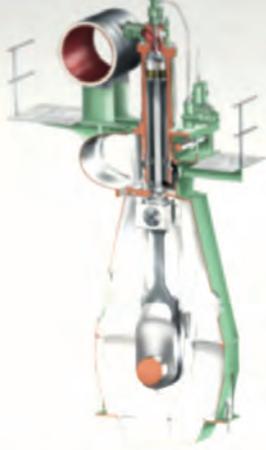
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### On-line Edition

The Royal Institution of Naval Architects is proud to announce that as of January this year, *The Naval Architect* journal has gone digital. We are very pleased to inform the maritime industry that each issue will be published online, on the RINA website. Visit [www.rina.org.uk/tna](http://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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## Smoke and mirrors

Smoke on the horizon, but SECAs should put a stop to it.

Trade association Interferry said it intended to regroup shipping's opposition to coming limits on sulphur emissions, after a circular distributed at early October's International Maritime Organization Marine Environment Protection Committee highlighting industry concerns fell on deaf ears.

Interferry broke cover with a formal intervention opposing the coming Sulphur Emission Control Areas, but the trade association found the administrations already some way into the detail of rule development in no mood to be sidetracked.

From 2015, Sulphur Emission Control Areas will be established in the Baltic and North Seas, limiting sulphur emissions to 0.1%.

The Interferry board of directors, meeting at the annual conference in Hong Kong, instructed its members to lobby national administrations before and during IMO meetings in order to have more success in the future. The trade body is clinging to "a faint hope that we could get a review period in 2013 included in the proposed amendment".

Interferry said that, in representing the ferry Industry worldwide, it strongly supported environment-friendly transportation of goods and passengers.

The proposed amendments to MARPOL Annex VI were in the general context important steps in the right direction to further improve the use of environment-friendly transportation of goods worldwide, it said. However, "now that this package is on the table for decision it... seems clear

that few have observed that one part of the package will be significantly counterproductive".

Interferry said that the proposed limit of 0.1 % sulphur in fuel used in SECAs

**"Attention must now be drawn to a proposal that evidently has been preceded with little or no analysis of its consequences"**

from 2015 "may at first glance seem like a step in the right direction for the environment", but to Interferry members operating within today's SECAs, "it is evident that there will be a modal back shift of significant proportions from sea to land in the cargo flow within Northern Europe and thus a significant increase to the load factor on the already strained network of land transportation routes".

In a circular sent to its member organisations in Northern Europe, Interferry asserted that, if the 0.1 % level were adopted, there would be an additional cost of some US\$7 billions per year to be carried by the operators within the current SECAs. Half of that cost, some \$3 billion - \$4 billion, would affect short sea segments

like ferries, ro-ros and container feeders, the trade body said. Freight rates would have to be increased by 30%-35% in order to cover the additional fuel cost, which would significantly degrade the competitiveness of shipping as a means of transportation in the supply lines within, and to and from, Northern Europe. "It is important to fully appreciate that the short sea segments are not able to pass on the cost to the cargo owner or passenger, as these segments are under direct competition with other modes of transport," Interferry said.

"Attention must now be drawn to a proposal that evidently has been preceded with little or no analysis of its consequences, if adopted as proposed, and where clear indications are at hand that the end results will have severe negative impacts on the environment and economies of the countries affected."

Interferry urged "the distinguished delegates of MEPC" to take these "facts" into consideration when processing the proposed amendments to MARPOL Annex VI and "to consider introducing a review clause similar to the one being introduced for global shipping sulphur requirements".

Interferry's failure to attract support at MEPC led it to exhort its members in Northern Europe to seek the help of their national shipping administrations in lobbying the IMO.

However, with the IMO under particular pressure from the European Union to fast-track the new rules on SECAs, it seems that Interferry's opposition may be "too little, too late". *NA*

## Containerships

## GL upgrades boxship rules

With 158 containerships of 10,500TEU capacity and above entering service by early 2012, Germanischer Lloyd (GL) has launched new Construction Rules for the ship type.

“Shipbuilders and designers have requested us to spell the calculations and requirements out. It is not only the rules, but also why they apply and how to calculate them”, said Jan-Olaf Probst, of GL’s new shipbuilding division.

GL said all requirements were now compiled in one concise, customer- and user-friendly document. The new edition also comes with enhanced graphics as well as updated tables and illustrations.

Classification rules have been developed to guarantee the structural strength and integrity of essential parts of a containership’s hull and superstructure. Furthermore, the new rules assure the reliability of the propulsion and steering, thereby ensuring safe operation of the ship, says GL.

Where the previous edition described the procedures and instructions in general terms, the revised issue puts a stronger focus on details, providing more specific instructions on procedures such as cargo hold calculations. The section “Structural Fire Protection on Board Seagoing Ships” incorporates new requirements based on the Fire Test Procedure Code.

New recommendations are also given for strengthening shell plates and profiles to minimize propeller-induced vibrations. Avoiding deckhouse vibrations - including those affecting the cantilever navigation bridge wings as well as the radar mast located on the compass deck - is a concern addressed by a set of new recommendations.

As for the deck area, the revised edition contains new requirements regarding the arrangement of strengthened insert plates. This also concerns openings within and close to insert plates. The requirements for breakwaters have been updated in terms of loads, sizes and dimensions for plates, stiffener and girders.

## Cruiseships

## Cruise Barcelona delivered

*Cruise Barcelona*, the second in a series of four innovative cruise-ferrys ordered from Fincantieri by Grimaldi Group, has been delivered and will immediately take up daily service on the ‘motorway of the seas’ which connects Civitavecchia (Rome) to Barcelona.

Built at Castellammare di Stabia, the ship belongs to a new generation of ships which combine the comfort and



The largest cruise ferries in the Mediterranean – now in service.

entertainment of cruise vessels with the flexibility and loading capacity essential for ferry services. Joining her sister ship, *Cruise Roma*, which was delivered in April, *Cruise Barcelona* will complete the voyage Civitavecchia – Rome in 20 hours.

Capable of carrying 2300 passengers and with 3000 lane metres for trucks and trailers in addition to 215 cars at a speed of 28knots, *Cruise Barcelona* has 478 cabins equipped to modern cruiseship standards. At 225m long and 30.45m wide, the 55,000gt ship and her sister are the largest ferries in the Mediterranean.

Delivery of a further two sister ships ordered from Fincantieri by Grimaldi Group is due in autumn 2009 and spring 2010. The total value of the investment is in the order of €600 million for the four ships.

## LNG

## Samsung wins Flex topside

Samsung Heavy Industries Co. has been awarded the full turnkey contract by UK-Based FLEX LNG to build the world’s first LNG-FPSO.

The long-trailed LNG-FPSO, a high-valued added complex vessel, will cost over US\$1 billion to construct, including the US\$551 million LNG-FPSO topside plant.

SHI already won the US\$459 million order for supply of a LNG-FPSO hull last April.

SHI stressed that it had developed the LNG-FPSO topside plant independently, with a view to handling 1.7 million tonnes of liquefied natural gas per year.

The LNG-FPSO is a self-propelled LNG floating production, storage and offloading (FPSO) vessel. As the topside plant will be required to liquefy the natural gas, its price is over four times that of a conventional large LNG vessel.

SHI said that the stand-out order meant that it had achieved 90% of its revenue target for 2008, with US\$13.5 billion worth of orders. SHI also said it expected that it



Image courtesy of Daewoo-Manulda Heavy Industries

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would achieve revenues surpassing US\$20 billion for the year as a whole, as high value drillship projects filtered through into its accounts by December.

SHI won orders for four LNG-FPSO hulls from FLEX Ltd. last April.

It will be expected that more orders for top-side plants would be succeeded soon.

The LNG FPSO, which will have a maximum transit speed of 9knots, will be delivered in 2011 to Nigeria

Based on this order for 220,000m<sup>3</sup> LNG-FPSO, SHI said it now planned to develop a Very Large LNG-FPSO next year, with a capacity of 560,000m<sup>3</sup>.

#### Bulk carriers

## Cicek launches new bulker design

Turkish shipbuilder Cicek Shipyard has launched a new 25,000dwt bulk carrier design.

The current Handysize bulk carrier fleet is now ageing and Cicek said it believed that many owners will soon be placing orders for replacement tonnage to meet new regulations and offer improved efficiency.

Berke Cicek, vice president of Cicek Shipyard, said: "Our new double-hull design meets all current and anticipated environmental and safety regulations. In particular, it will qualify for the additional class notation CSR (Common Structural Rules) and will be compliant with the new Performance Standard for Protective Coatings (PSPC), which is intended to increase vessel safety and lifecycle by preventing corrosion.

"We have also concentrated on designing a vessel that is economical to operate. Many owners of older tonnage today are suffering because main engines built 15 or 20 years ago are expensive to run both in terms of bunkers and maintenance. We expect our vessel to operate with a crew of 22 and to maintain a service speed of 13knots on just 21.5tonnes a day.

"Further economies are expected due to the arrangement of the four holds, which are designed to be easily cleaned, thus saving time and labour."

The standard design features 35-tonne cranes, enabling larger than normal grabs to be used for bulk cargoes and for loading heavy unitised cargoes such as steel coil. Strengthening of the tank top to 20 tonnes/m<sup>2</sup> and MacGregor hydraulic hatchcovers are also key features when it comes to increasing the speed of loading and discharge.

Cicek said it was happy to discuss owners' special requirements, including different engine specifications for a higher service speed and alternative crane configurations. The yard is also able to offer delivery dates in 2010.



Turkish shipbuilder Cicek Shipyard has launched a new 25,000dwt bulk carrier design that meets new regulations and offers improved efficiency.

#### Regulations

## Anti-Fouling rules finally in force

The International Convention banning the use of organotins and other harmful substances in anti-fouling paints applied on ships' hulls finally entered into force on 17 September 2008.

The International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) was adopted as long ago as 5 October 2001 by IMO, but the terms for its entry into force demanded ratification by 25 States representing 25% of the world's merchant shipping tonnage was only reached last year. Today, the Convention has, to date, been ratified by 34 States, with a combined 52.81% of world merchant shipping tonnage.

Under the Convention, ships are not permitted to apply or re-apply organotin compounds which act as biocides in their anti-fouling systems; ships either shall not carry such compounds on their hulls or external parts or surface or, in the case of ships that already carry such compounds on their hulls, will have to apply a coating that forms a barrier to prevent them leaching from the underlying non-compliant anti-fouling systems.

The Convention also establishes a mechanism to evaluate and assess other anti-fouling systems and prevent the potential future use of other harmful substances in these systems.

The Convention applies to ships flying the flag of a Party to the Convention, as well as ships not entitled to fly their flag but which operate under their authority, and to all ships that enter a port, shipyard or offshore terminal of a Party. It applies to all ships, including fixed or floating platforms, floating storage units (FSUs) and floating production storage and off-loading units (FPSOs).

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## Ancillary equipment

## AMP boxship order

Alternative Maritime Power (AMP) specialist, Cavotec MSL, has won an order from Taiwan's CSBC Corporation to supply four AMP systems for installation on four newbuild container vessels.

AMP, or 'cold ironing', involves vessels turning off their engines while in port, and connecting to shore-side electricity, thus helping to reduce pollution in port areas and surrounding communities.

Yang Ming Marine Transport will install the systems on four 6600TEU container vessels to be built at the Kaohsiung shipyard in Taiwan. The ships are set for completion in 2010 and 2011, with delivery of the AMP units expected to run from the end of 2009, until the beginning of 2011.

Once in service, these ships will be able to switch off their engines and plug into the local electricity grid at ports equipped to supply AMP, such as the Port of Los Angeles, and the Port of Long Beach, where a growing number of vessels use shore-side electricity.

A recent AMP installation from Cavotec.



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**Phone** +44 1778 346 769

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**www.cavotec.com.**

## Shipbuilding

## Wärtsilä acquires Navelec

Wärtsilä has acquired Navelec SAS, a French company specialising in marine navigation and communication systems, electrical marine services, and control and automation services. Navelec's main office is located in Le Havre, in France, with branch offices in St. Nazaire and Brest.

Navelec's annual net sales were €7 million in 2007. The company employs 45 people, of which 26 are field service personnel. Navelec's businesses will be integrated into Wärtsilä Services' business in France. All employees will continue as Wärtsilä employees. Wärtsilä acquired Navelec from Société Financière pour l'Industrie et l'Agriculture (Sofia). The value of the deal has not been disclosed.

In addition to Navelec, Wärtsilä has this year acquired Maritime Service and Vik-Sandvik of Norway, International Combustion Engineering of Denmark, and Claus D. Christophel Mess- und Regeltechnik GmbH of Germany.

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**Tel** +358 10 709 0000

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**www.wartsila.com**

## Shipbuilding

## Aker Solutions drills contracts

Aker Solutions has been awarded two contracts by Daewoo Shipbuilding & Marine Engineering Co. Ltd (DSME) in South Korea for delivery of drilling equipment for two ultra deepwater drillships. The total contract value for Aker Solutions is approximately US\$235 million.

The scope of work for Aker Solutions is to deliver complete drilling equipment packages consisting of engineering, equipment deliveries and commissioning services. The drillships are scheduled for delivery in the second quarter of 2011 and the fourth quarter of 2011. The contract party is Aker Solutions subsidiary Aker MH AS.

**Contact** P.O. Box 453 Skøyen, N-0213 OSLO, Norway

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Picture courtesy of Ulstein Verft AS Norway

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Ancillary equipment

## MacGregor's total solution

Cargotec's MacGregor business area has secured a contract with SE Shipping Lines Pte Ltd of Singapore worth around €32 million. MacGregor will supply a total cargo handling solution that includes hatchcovers and company's new 450tonne SWL cranes for four firm 25,000dwt heavy-lift vessels being constructed for SE Shipping at the Wenzhou Zhongou shipyard in China. Delivery of the cargo handling equipment is planned for 2010 and the first ship with new equipment is expected into service at the end of 2010.

MacGregor will supply shipsets comprising foldtite and rolling-type weatherdeck hatchcovers, lift-away tweendeck hatch covers and its new 450tonne capacity GLH deck cranes to the series of four 25,000dwt heavy-lift ships.

MacGregor's cargo-handling shipset for each vessel comprises of two electro-hydraulic GLH deck cranes, which have a lifting capacity of up to 450tonnes, a maximum hoisting speed of 36m/min, a luffing time of 150-220 seconds, and a maximum slewing speed of 0.65rev/min.

Along with 14 folding and rolling type hatchcover panels, which are operated by external hydraulic cylinders and are manually cleated and weathertight, sealing between the hatch cover and coaming is achieved through rubber packing, which is fitted on the panel and tightened against the coaming. The packing is of sliding type, acting directly on the stainless steel mating plate on top of the coaming. Each joint sealing between the rolling panels and the joint between the rolling and 'foldtite' panels is also achieved through rubber packing which is fitted on one panel and tightened against a counter rubber on the other panel. This MacGregor Omega-type rubber packing is removed by compressed air before operation of the covers.

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**E-mail** ofssales@macgregor-group.com  
**www**.macgregor-group.com

Electronics

## Sailor 500 gets retracted

Thrane & Thrane's flagship SAILOR 500 has been chosen for a large-scale retrofit of Inmarsat FleetBroadband to A. P. Moller - Maersk, one of the world's largest shipping fleets, across its Maersk Tankers and Maersk Supply

Service fleets. The first phase will take one to two years and see a minimum of some 150 vessels equipped with SAILOR 500.

The supply contract, was signed through Thrane & Thrane's Certified Partner Polaris Electronics of Aalborg with airtime contractor Marlink, a leading satellite communications integrator.

Prior to sea trials and testing, A. P. Moller - Maersk and Thrane & Thrane tested security, IT network and infrastructure based on the proven Thrane & Thrane technology, allowing a swift roll out to the ships. The testing reflected the ability of Thrane & Thrane to meet the demands of the broad scope of vessels and geographical areas of the A. P. Moller - Maersk fleet, also proving the benefits of FleetBroadband and SAILOR 500 towards crew welfare and communication.

SAILOR 500 FleetBroadband provides speeds up to 432kbps, which is four times faster than current generation Fleet77 systems. It utilizes an antenna similar to the midrange SAILOR Fleet55, with a diameter of less than 60cm, weighing just 16kg.

**Contact** Thrane & Thrane A/S, Lundtoftegårdsvej 93 D, 2800 Kgs. Lyngby, Denmark

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Ancillary equipment

## Torque about an upgrade

Op-Torq power measurement and data monitoring system manufactured by OpDAQ Systems Inc is a new accessory to the TorqueTrak Revolution continuous torque and



Op-Torq: the new data monitoring system from OpDAQ.

power measurement instrument. The Op-Torq design is marine-specific, with configurations for single or twin-shaft vessels with many options available to suit the needs of both private and commercial craft.

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# Ship design a key driver for Wärtsilä

Wärtsilä Corp has set out its vision as a major force in independent ship design, following its acquisition of a third naval architecture company within 24 months.

**W**ärtsilä vice president, ship design, ship power, Arne Birkeland said the company no longer sees itself as simply an engine or propulsion systems supplier, “because engines are now only one part of our offering to shipowners”, after the Finnish company snapped up Conan Wu & Associates Pte Ltd (CWA), headquartered in Singapore, in September for €23 million. The deal includes partnership agreements regarding CWA’s business in Malaysia, China and Hong Kong.

Having established a conceptual ship design unit in 2004, Wärtsilä went on to acquire German ship design company Schiffko in 2006, which focuses on merchant ship designs. Then, in July 2008, Wärtsilä acquired offshore vessel specialist Vik-Sandvik of Norway. Today, Wärtsilä’s ship design activities include operations in more than 10 countries and more than 500 employees, and generate a turnover of €70 million in their own right. The company now sees itself as one of the top three independent players in the area of offshore services, tugboats, workboats and special ship designs.

In 2007, the turnover generated by CWA’s businesses was €10.7 million.

“This deal is a clear demonstration of Wärtsilä’s commitment to becoming the leading provider of ship design services in the areas which we specialise in, including offshore and special vessels as well as selected merchant vessels,” said Jaakko Eskola, group vice president, Wärtsilä ship power.

“The role of ship design is becoming increasingly important in the value chain, due to higher integration and more sophisticated systems onboard most vessels and increasingly stringent environmental regulations. In addition the ship design is more and more linked to system providers, shipyards and integrators. Ship production is moving away from traditional shipbuilding countries in the west to emerging markets where there is a need for ship design skills. We can now build upon our existing strengths and strategies and, through Wärtsilä Ship Design, further develop our overall capabilities to include design.”

Contrasting Wärtsilä’s strategy with certain of its competitors, Mr Eskola

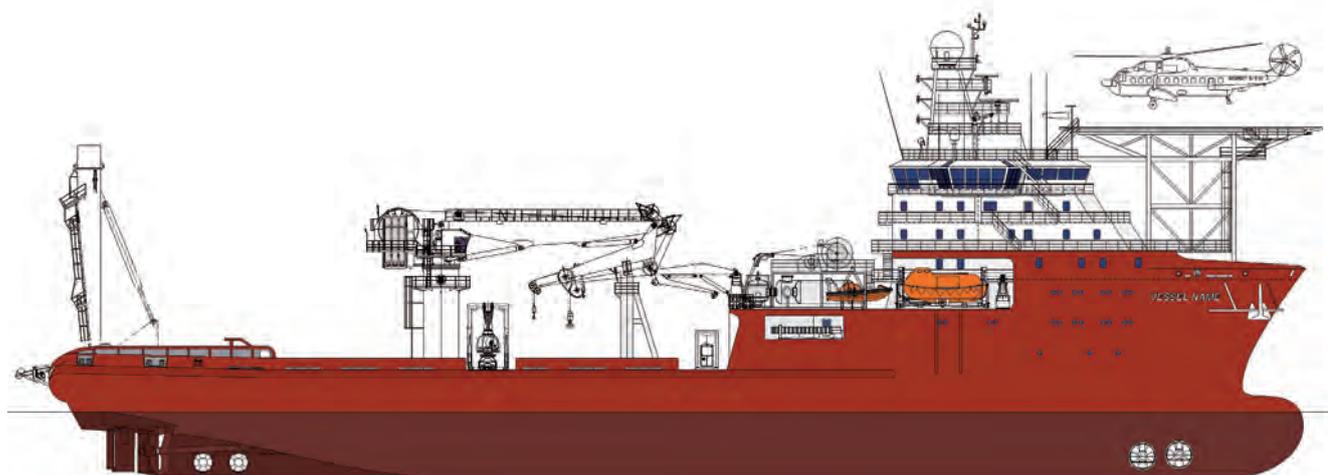
stressed that the company was not going to use its ship design skills as a lever to steer customers in the direction of Wärtsilä’s shipboard equipment. “This is an independent ship design company,” he reiterated.

However, he added: “From a strategic point of view, being able to offer ship design services is a very important step for Wärtsilä, since it brings us even closer to our shipowner and shipyard customers. We can now enter into dialogue with them at an earlier stage, when the key specifications of the vessel are being decided. This puts us in a position to offer even more competitive solutions.”

“The acquisition of CWA expands the geographical scope of Wärtsilä’s ship design services,” added Mr Birkeland. “It also excellently complements and broadens Wärtsilä’s ship design competence to cover a larger range of vessel types, including smaller, less complicated and more standardised vessels.

“With the acquisition of Schiffko, you could say we entered the playground,” said Mr Birkeland. “With Vik Sandvik, we said this is the start of a significant journey. The

The 123m multi-purpose support vessel for China’s state-owned Shanghai Salvage Company.



CWA acquisition completes the first steps – now we can pursue a global way of working. We will, however, definitely not state that there will be no further acquisitions.”

CWA specialises in supplying naval architecture and ship design services to shipbuilders and shipowners. The company’s core competence is in the design of offshore vessels and tugs, as well as barges and smaller merchant vessels. CWA has a strong market position in South and South East Asia. As a part of Wärtsilä, CWA reckons to have growth potential throughout the region, including China, India and Vietnam.

CWA will be integrated into Wärtsilä Ship Design within the company’s Ship Power business. All personnel in Singapore – including the former owners Dato Conan Wu and Mr Mok Kim Terng, as well as the rest of the management of CW, will continue in Wärtsilä’s service.

### New reach

Demonstrating the new reach offered by Wärtsilä in independent naval architecture, the group released details of its latest orders. Orders were received from customers in China, India and Germany, the company said, and called for the development of a deepwater engineering survey vessel, a multi-purpose support vessel, a diving support vessel, and an emergency towing vessel.

The deepwater engineering survey vessel design is for China Oilfield Services Ltd, and represents a 4300dwt drilling vessel capable of operating in deep water for geotechnical surveys and geophysical surveys. To date, most of China’s oil exploration has been in relatively shallow waters, but there is now a need to probe deeper.

The Chinese state-owned Shanghai Salvage Company has ordered its multi-purpose support vessel design from Wärtsilä in order to carry out year-round tasks along the coastline of China. The key requirement is for multi-purpose flexibility since the vessel will be required to carry out salvage, offshore engineering services, diving and ROV operations, fire-fighting, anchor handling, ship supply, environmental protection, and route clearing.

The 4500dwt diving support vessel design has been ordered by India’s Oil and Natural Gas Corporation Limited (ONGC), and will provide a stable platform for saturation and air-diving operations. In addition to diving operations and construction work, the vessel is to provide field support and will, therefore, be fitted with sophisticated fire-fighting and oil recovery equipment.

In Europe, Wärtsilä has completed an emergency towing vessel design for the German company ARGE Küstenschutz. Because the vessel is intended for North Sea operation, the main criteria in producing this ultra-modern design have been manoeuvrability, and the capability of maintaining position effectively in harsh weather conditions.

In addition to the new orders, the Wärtsilä Ship Design unit has also completed designs for a new anchor handling vessel, a platform supply vessel, and a bulk carrier, all of which afford fuel consumption reductions of as much as 25%. This has been made possible by optimising the design to accommodate the vessels’ various operating processes. **NA**

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# Hamworthy adds to Brazilian tanker orders

Inert gas offering from Hamworthy makes inroads into emerging shipbuilding market.

**H**amworthy is to supply inert gas (IG) systems for 10 Suezmax tankers on order for Brazilian state-owned operator Transpetro from new yard Estaleiro Atlantico Sul.

The supplier was earlier contracted to supply 10 shipsets of pump room systems worth a total of around US\$12 million for the same tankers.

The 157,500dwt ships are the largest of the 26 tanker newbuildings of various types and sizes that form the first phase of Petrobras unit Transpetro's fleet expansion and modernisation programme, for which construction of 42 tankers altogether is forecast.

The IG plant order was placed by Samsung's purchase organisation, PILS. The equipment packages will be



Hamworthy's inert gas generator system for tankers.

delivered from May 2009 throughout 2011.

Hamworthy's inert gas generator system

has a capacity of up to 20,000 Nm<sup>3</sup>/h, and is based on compact modules offering savings in space and installation costs both for newbuildings and for retrofit on existing vessels. Other characteristics of the design are high efficiency, low maintenance costs, and safe and easy operation, according to Hamworthy. "The unique Moss design is based on experience from thousands of installations since the first in the 1960s," said Per Risvik Syversen, sales director at Hamworthy Moss.

Each shipset of pump room equipment for the Transpetro series will include: cargo and ballast pumps in Ni-Al-bronze from Hamworthy's own foundry; steam turbines; electric motors; gas-tight power transmissions; stripping system; and stripping pump. **NA**

## Plastic in the pipeline

Plastic pipework manufacturer Durapipe says the level of demand from the marine sector has taken it by surprise.

**P**lastic pipework manufacturer, Durapipe UK, reports a new promotional focus, after sustained and unexpected demand from the shipping industry for its non-corrosive water handling systems have made marine its fastest growing market.

As steel prices have continued to rise, owners and yards alike have increasingly looked to alternative materials, and have come to value the fact that plastics offer no possibility for corrosion or limescale build up, according to Durapipe. Also persuasive is the fact that Durapipe is one sixth the weight of steel, and requires no hotworks permit and attendant exclusion of personnel involved in other duties during installation. Durapipe said that fitting time taken could be put at 43% of the equivalent steel installation.

Its range of plastic pipes, fittings and valves

can be applied on any ship type, including naval vessels, containerships, cruiseships, bulk carriers, ferries, ships featuring hull chilling, patrol boats, fishing vessels and superyachts.

The full range includes: Durapipe ABS, a lightweight and corrosion-free, ductile material commonly used for low temperature fluid transportation (down to -40degreesC); Vulcathene, a chemical resistant polypropylene plumbing system for drainage; and C-PVC, a lightweight alternative to copper or steel that is suited for conveying hot and cold potable water, but also for transporting corrosive solutions at temperatures of up to 95degreesC.

All of the available materials for marine applications are approved by ABS, Germanischer Lloyd, Bureau Veritass, Det Norske Veritas, and Lloyd's Register, with approvals pending from Italian class body

Rina and the Russian Maritime Register of Shipping.

Applications range from drinking water plant, through ballast water systems, swimming pools, chilled water for airconditioning, hot and cold water plant, drainage, ice-making equipment in the hold, to propulsion system cooling. In the last instance, Durapipe reports particular recent success in supplying plastic ABS piping for podded propulsion systems, where low temperature capability, plus corrosion resistance, coupled with a 10bar pressure rating, are key persuasive attributes for the material when applied to a freshwater cooling system.

Shipyards in Taiwan, Germany and Finland are already specifying Durapipe products. **NA**



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# Making waves on transom design

A CFD research project by MARIN is casting new light on transom stern design.

Today most motor yachts, ferries and containerships are designed with wide transom sterns. Transom stern design can have a large effect on fuel consumption because an unsuitable design will generate transverse waves that are detrimental to resistance. Therefore, precise design guidelines and insights are desired.

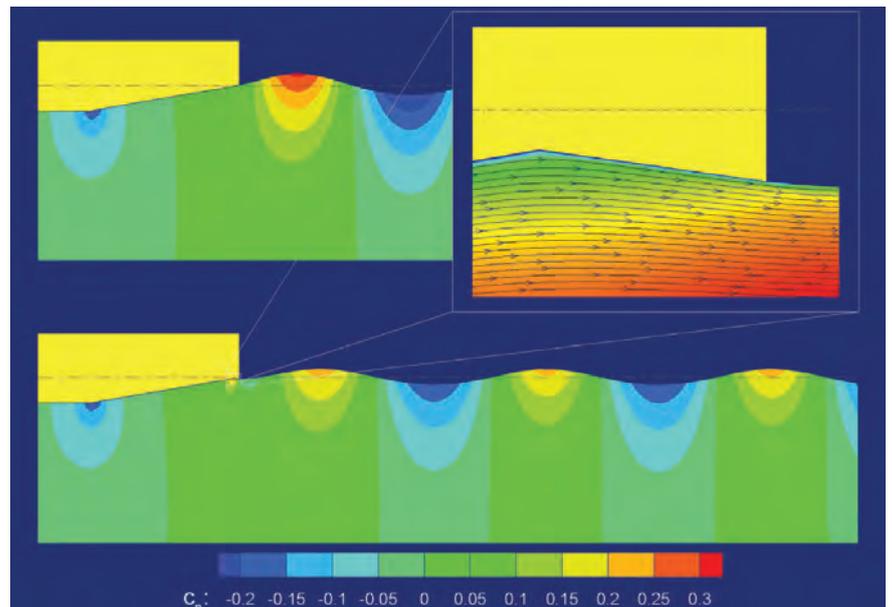
Model experiments are normally used to optimise the stern lines and any trim wedges, interceptors or ducktails. But now the viscous-flow solver PARNASSOS from research institute MARIN is providing new insight into the physics and scale effects.

To extend insight into the flow physics and to determine design trends and scale effects, last year, MARIN's CFD group started a research project to study the wave making and resistance of transom aftbodies.

In their paper presented to last year's 9th International Conference on Numerical Ship Hydrodynamics, Michigan, 'Computation of transom-stern flows using a steady free-surface fitting RANS method', Bram Starke, Hoyte Raven, and Auke van der Ploeg, all of MARIN, gave details of the work the research body has been doing on transom stern design.

They pointed out that methods to compute viscous flows with free surface around ship hulls (RANS/FS methods, solving the Reynolds-averaged Navier-Stokes equations with free surface) have undergone substantial development over the last decade. While most current methods require long periods of computation, and dense grids are needed to avoid undue numerical wave damping, the limits are being gradually shifted and practical application in ship design is approaching.

Today, they said, the most common way to predict ship wave patterns and wave resistance in practical ship design is by using free-surface potential flow codes. Compared with these, the much



An example where the application of a trim wedge (bottom vs. top) reduces the wave amplitude behind the transom. In the top-right corner a detail is shown of the flow field around the wedge.

more computationally-intensive RANS/FS codes include all viscous effects on the wave pattern; therefore, the latter should offer improved stern wave predictions in the first place, and perhaps other improvements locally; besides, of course, providing the viscous flow field.

An important application area in which RANS/FS codes should enable a step forward in design quality is the flow off a transom stern. The majority of modern vessels have transom sterns which are immersed at rest for fast vessels and for some very full-block vessels, but which are usually above the still-water surface for most merchant ships.

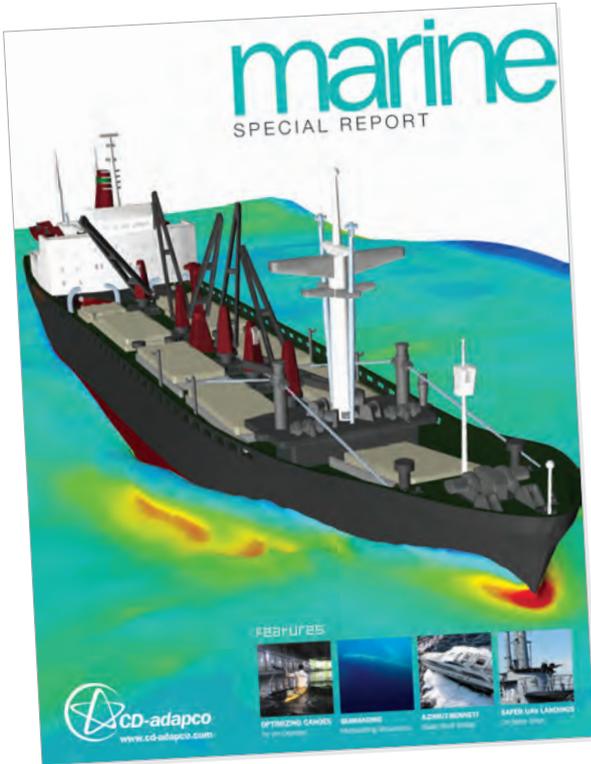
Design requirements have stimulated the use of very wide and flat transom sterns, e.g. for ferries. Thus the design of the stern and choice of the transom edge height has become rather critical. For a proper transom stern design, it is essential to foresee the flow regime that will occur there: will the transom be wetted (with a recirculating flow aft of it) or dry (with a

smooth detachment of the wave surface from the transom edge), for the ship at full scale at a given draft and speed? Will the flow be smooth or will wave breaking occur aft of the transom? It is not easy to answer these questions based on experience only.

Rules-of-thumb are sometimes quoted for assessing whether a transom is cleared; but these simple rules are only applicable in very simple situations and are evidently inadequate for normal ships. In general situations, the transom flow regime depends on the transom height and shape, buttock slope, the wave system generated upstream, the boundary layer flow around the hull, etc. Therefore, RANS/FS methods can make an important contribution by predicting the transom flow pattern, enabling a more precise stern design to guarantee a favourable flow at full scale.

## Two stage study

In the first part of the MARIN study, the ship was modelled as a two-dimensional



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A detail of the computational mesh near the transom for the wetted flow regime

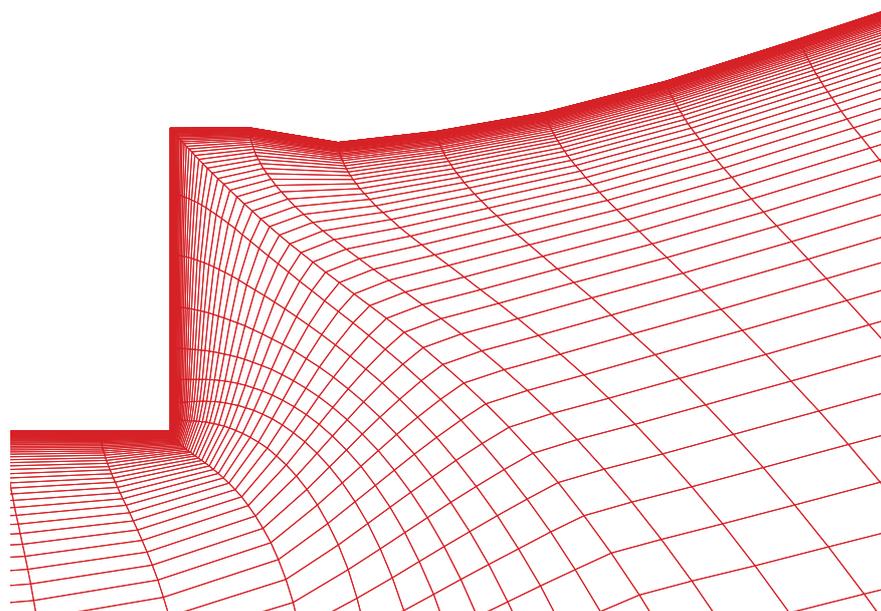
(infinite-beam) flat-bottomed barge. First the applicability and accuracy of the PARNASSOS/FS code used was checked. Based on grid refinement studies the authors conclude that well-converged, numerically accurate steady results could be obtained in a rather straightforward manner. For dry-transom flows, quasi-inviscid solutions have been computed and found to be in excellent agreement with the potential-flow solutions from Vanden-Broeck (1980). Solutions obtained for the wetted-transom regime are in good agreement with the experimental data from Maki (2006), for the wave profile aft of the transom.

Systematic computations were then made for varying transom draughts, giving rise to dry-transom or wetted transom flows. In the dry-transom regime, for increasing transom immersion the stern waves get steeper, the longitudinal velocity at the first wave crest decreases, and eventually it quickly falls to zero. This indicates the onset of stern wave breaking. For the hull form considered, in inviscid flow this happens for a Froude number based on the transom draught of 2.26; but for the viscous-flow cases considered here this limit is shifted to about 3.3 for full scale, 4.0 for model scale. Therefore, a large scale effect was found on the inception of wave breaking: In a range of transom immersions, a breaking stern wave was predicted at model scale, whereas at full-scale the flow was entirely smooth.

For a further draft increase, this breaker moves towards the transom and a wetted-transom flow occurs.

Also, for wetted transoms, scale effects were computed. Some difference between model and ship was found in the wave elevation at the transom, and also on the transition to a dry-transom flow: In a small range of transom immersions, the transom will be wetted at model scale, but dry at full scale, with wave breaking further aft. These are striking examples of viscous scale effects on transom flow.

In the intermediate regime, in which the transom is cleared but a spilling



breaker occurs at the front of the following wave, it appeared to be harder to obtain a converged result, and at this moment only some rather coarse solutions have been obtained, which are qualitatively reasonable but not reliable yet.

The authors also addressed the transom resistance, and found scale effects in the wetted regime only (for this case): For full scale the transom resistance coefficient is somewhat larger than for model scale.

“There is room for improvement of the design of the trim wedge and/or aftbody.”

A simple transom flow model has been formulated, based on the assumption of a constant base pressure coefficient at the transom; which gives insight in the principal mechanism determining the wetted regime and its scale effects.

The authors point out that the test case provides very useful insights in the characteristics of transom flows but that in three-dimensional cases the influence of the displacement effect of the boundary layer and wake will

partly counteract the scale effect on the inception of stern wave breaking found in the present study.

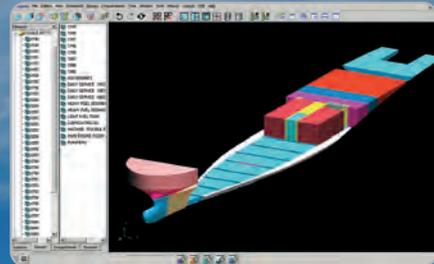
The second part of the study addressed trim wedges. These are of course used to reduce trim for fast vessels, but have sometimes also been found to reduce resistance for larger displacement vessels. The hydrodynamic details of the flow around trim wedges are not all well known. Trim wedges are therefore, primarily designed using tank test data, which is costly and, in the case where viscous scale effects are present, not necessarily optimal.

According to the authors, an extensive computational study using again the same RANS/FS code for two-dimensional cases has provided insight in the optimal wedge angle and length for various stern shapes, and also the optimal height of interceptors. Differences between model scale and full scale, unknown up to now, were determined. The research is still being continued, now for three-dimensional cases (ship hull forms), to make a step towards practical application.

In this way, a lower ship resistance and a corresponding reduction in fuel consumption may become achievable for a class of vessels. CFD studies have proven instrumental in providing the increased insight on flow physics and scale effects that enables this. *NA*

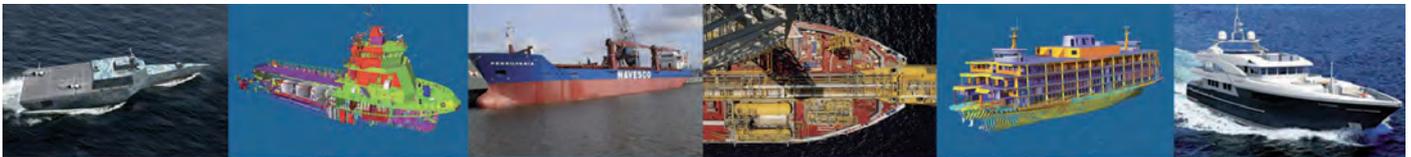
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# Chinese breakthrough for FORAN

Akron Group becomes the first commercial user of FORAN in China.

**A**kron (China) Group has decided to use Sener's FORAN package as its main ship design system after a selection process that has lasted more than two years. Akron is the system's first commercial FORAN user in China.

Panagiotis K. Mitroulias, executive director of Akron (China) Group, said: "We chose FORAN as our main system for ship design and construction, not only because of its advanced technology and powerful capability, but also because UFC (United Force Corporation - Sener's partner in China) can provide a leading PLM system and digital shipbuilding solution as well as FORAN. Akron and UFC have the same vision in the digital shipbuilding area, so we have established a long term strategic partnership

to study and construct our digital shipbuilding platform in Akron (China) Group."

"The FORAN implementation in Akron is the first step of the collaboration," said Geoffrey Wang, general manager of UFC. "The long term partnership with Akron is strong proof of our investment in digital shipbuilding. Our solution can fully meet the requirements of the shipbuilding industry. We have invested in this area with significant resources, and we will continuously expand the solution to provide ever more functions and services for our customers. Also, we wish to set up a successful reference installation based on the FORAN application and digital shipbuilding with the combined effort of UFC, Sener and Akron."

Luis Garcia, executive vice president of

Sener, said: "Since the Chinese shipbuilding industry will be No.1 in the world in coming years, we are committed to take advantage of our experience in ship design to support UFC, in the promotion of FORAN in more and more shipyards and design offices. We will do our best to help them improve the process of ship design and construction in the Chinese shipbuilding industry, and thus to enhance the competitiveness."

Now that FORAN has been installed in Akron Design Department in Shanghai, and the personnel have received the necessary training, the next step is to use FORAN in the whole design process of a real project. At the same time discussions between Akron and UFC are ongoing for the digital shipbuilding system based on FORAN. **NA**

# GL and CD-adapco strengthen CFD ties

Germanischer Lloyd has joined CD-adapco's Customer Advisory Council

**F**low thermal stress simulation software and services CD-adapco and classification society Germanischer Lloyd (GL) are extending their partnership.

Both companies already work together in the field of Computational Fluid Dynamics (CFD) technology for marine applications, but the SMM fair in Hamburg saw a special event to mark the fact that Karsten Fach, head of Competence Centre for Engineering Services with GL, has joined CD-adapco's Customer Advisory Council.

The partners said that the strength of the cooperation was attributable to the increasing importance and progress of computer-aided engineering in shipping. "Reliable and accurate predictions at the earliest stage of the design process can lead to significant savings in effort and money, compared to performing tests and amending the design in a subsequent part of the process", they said. "The collaboration of Germanischer Lloyd



Left to right: Raimund Schipp, CD-adapco European director of sales, Torsten Schramm, GL senior vice president Europe/Middle East/Africa and chief operating officer, and Karsten Fach, head of Competence Centre for Engineering Services with GL.

and CD-adapco helps the two companies combine their theoretical and application expertise."

Dr Ould el Moctar, GL head of department, fluid dynamics, said: "Germanischer Lloyd and Cd-adapco have already been working together for many years. Both parties have considerable experience in the field of CFD analyses. The true value offered by advanced engineering providers lies in the symbiosis of software or hardware and highly skilled staff"

Meanwhile, CD-adapco chose the same event to unveil the latest version of its CFD software, STAR-CCM+. The package features a new 'dynamic fluid body interaction' model, which allows the fluid induced motion of an object to be predicted in six degrees of freedom. According to Jean-Claude Ercolanelli, CD-adapco vice president of product management: "The meshing process for a DFBI simulation is identical to that for a simple non-moving calculation and the DFBI model accomplishes its task without invoking the complex and time-consuming re-meshing schemes used by other Computational Fluid Dynamics tools." **NA**



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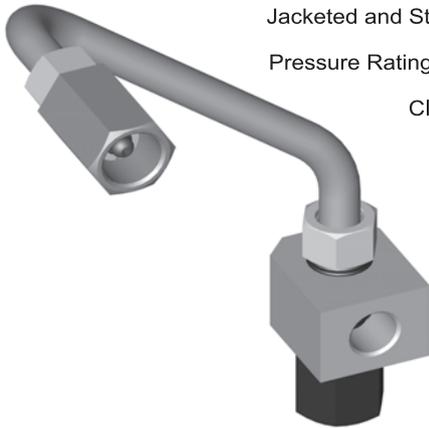
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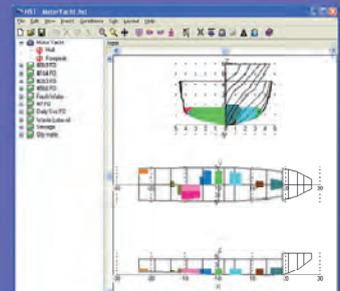
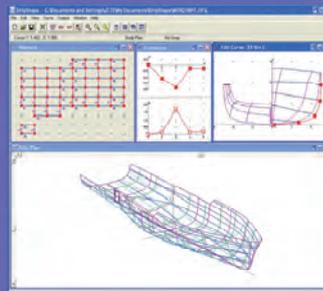
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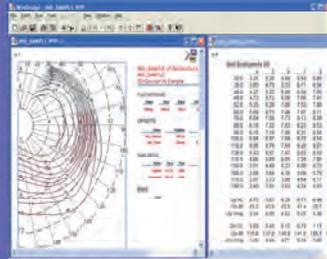
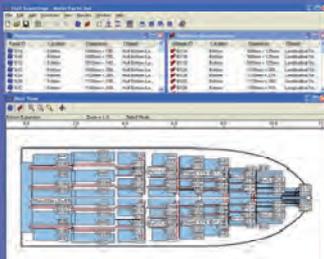
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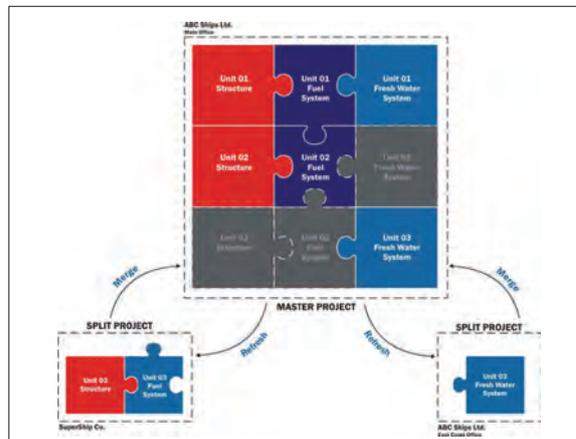
# The 'split & merge' tool gets constructed

ShipConstructor launches a new tool to enhance project outsourcing.

ShipConstructor has launched what it is terming its "Split & Merge enterprise solution".

Rolf G. Oetter, ShipConstructor president, said: "Split & Merge is a critical strategic tool that makes it easy to outsource portions of a project to specialised subcontractors while maintaining overall control and concurrent engineering through periodic merges. SSI's Split & Merge database management system is a very easy-to-use way to parcel out distinct design/production module development assignments to skilled teams anywhere in the world. They can independently develop their section quickly, cost-effectively and accurately, then send back the completed file over a secure network for seamless reintegration into a single project model."

Split & Merge ensures that all ShipConstructor-defined attributes (such as weight, material, radius, finishes, insulation, manufacturer, CG Point), as well as any



Split & Merge scenario from ShipConstructor.

modellers to create the parts with detailed accuracy, in turn facilitating efficient production in the shipyard, according to the developer. In addition, Split & Merge enables designers to send completed sections to the shipyard for construction while other sections are still being developed, significantly decreasing

number of user-defined attributes (such as order/model number, plate process) are communicated to all project participants. Users can also specify whether their attributes are essential or not. This allows a yard manager to set up the "rules", which enables

design-to-build time.

The entire ShipConstructor product model and all attribute data can be exported to Navisworks and projected for periodic group review of every detail from a whole-ship perspective. **NA**

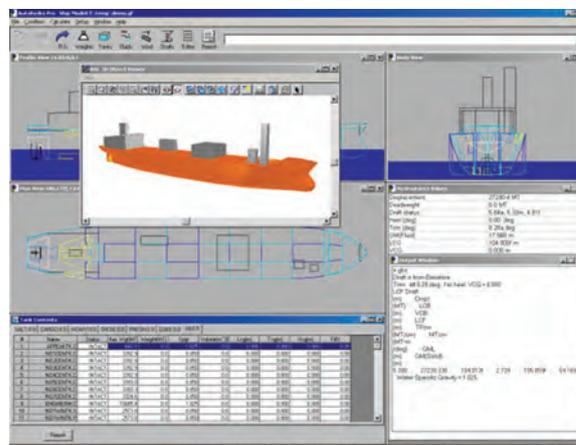
## Autohydro & Autoship get updated

Autoship Systems Corporation (ASC) has released its updated version Autohydro 6.3, the hydrostatics and stability software, and Autoship 9.2, the ship hull design and surface modelling software.

ASC, in connection with its dealer and testers, reckons to have closely examined industry requirements and, as a result has come up with a critical list of additions, improvements, and enhancements for versions of its Autohydro and Autoship packages.

Autohydro is a hydrostatics and stability program. The program performs intact and damage analyses and produces customised stability reports which are accepted by all major governing approval bodies. New features of the Autohydro 6.3 include; implementation of new probabilistic, damage assessment to handle new rules for cargo and passenger vessels; and improvements to criteria assessment and a 3D viewer.

The Autoship hull design/surface



Autohydro 6.3 Main Screen with 3D Viewer.

(Non-Uniform Rational B-Spline) mathematics, to be able to give the user tools quickly and efficiently to create any hull-shape form, including superstructures and appendages. New features of this software are: targeted hull-form variation function; piecewise linear scaling function; more control on contouring; improvements to surface patch routine; and improvements to edge mate routine. **NA**

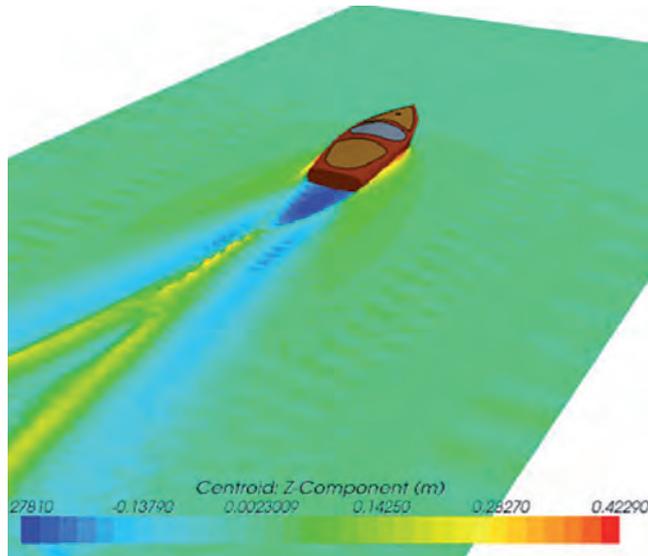
modelling program combines the graphical user interface of Windows with NURBS

improvements to surface patch routine; and improvements to edge mate routine. **NA**

### Reach up for the STAR

CD-adapco unveiled the latest version of its Computational Fluid Dynamics (CFD) software, STAR-CCM+ at this year's SMM. The new Dynamic Fluid Body Interaction model enables engineers easily to simulate the fluid induced movement of a body, for everything from a tanker listing under heavy seas to an aerodynamic body tumbling in freefall, according to the developer.

"The significant advantage of our new DFBI model is that it allows the fluid induced motion of an object to be predicted in six degrees of freedom, with no additional effort from the user, compared to performing a simple steady state simulation of flow past the same body," said Jean-Claude Ercolanelli, CD-adapco vice president of product management. "The meshing process for a DFBI simulation is identical to that for a simple non-moving calculation and the DFBI model accomplishes its task without invoking the complex and time-consuming re-meshing schemes used by other Computational Fluid Dynamics tools.



STAR-CCM+ is the latest version of CD-adapco's CFD software.



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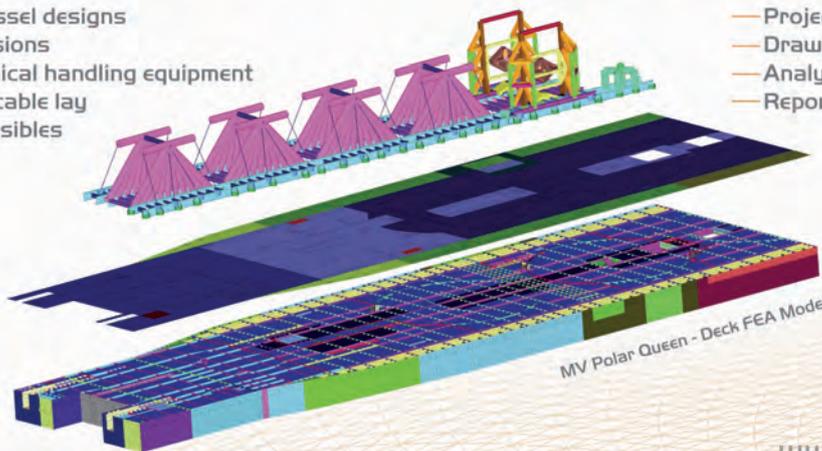
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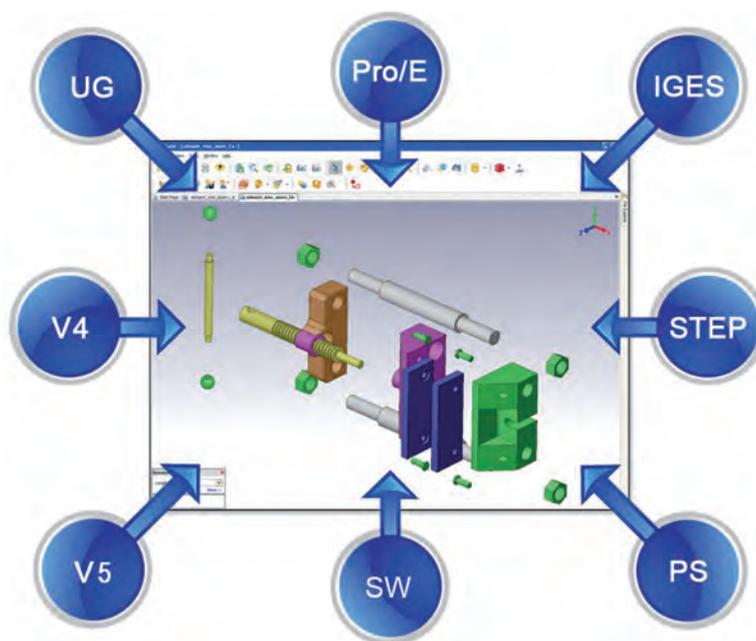
# Heterogeneous Multi-CAD

CCE has added the ability to create heterogeneous multi-CAD assemblies to EnSuite Version 2.

New features have been added to CCE's EnSuite Version 2 that enable users to build an assembly by inserting components from different proprietary and neutral CAD formats such as Pro/ENGINEER, CATIA V4 or V5, SolidWorks, Unigraphics, IGES, STEP and Parasolid.

The developer said that the new feature made it possible for each individual or company involved in a collaborative product development project to create and modify components in their own CAD system, while the entire assembly can be viewed, evaluated and marked up in a single environment. The new software eliminates the need to invest in multiple CAD systems to perform design reviews which involve collaborators working in multiple CAD systems.

"This new upgrade recognises today's collaborative, heterogeneous design environment where internal designers and engineers, suppliers, consultants and customers all work together to create the best possible design," says Vinay Wagle, CCE vice president sales and marketing. "EnSuite Version 2 greatly simplifies the collaboration process in this environment by enabling the entire assembly to be evaluated for form-fit-function while allowing everyone involved, to work in their own preferred environment without having to translate their data."



The new EnSuite Version2 simplifies the collaboration process.

Users that are viewing the multiple CAD assembly model can rotate, transform, move and delete components in the assembly model. They can add redlining, mark-up callouts, and standard shapes and text. EnSuite identifies the bill of materials (BOM) for the assembly. There is an option to display the Indented BOM which clearly shows the hierarchical information with the master, or top level, BOM describing a

list of components and sub-assemblies. The 'isolate part function' makes it possible to isolate a part quickly by making all of the other parts in the assembly transparent. The exploded view capability shows how parts fit together with other parts in the assembly without interference from other parts.

The latest EnSuite update will be available to all active subscription license customers as well as to new customers. **NA**

## Napa upgrades

Napa Group has launched its latest design package, in the shape of NAPA 2008.1.

One of the main areas of focus has been the development of new tools for probabilistic damage stability calculations, to check compliance against the new SOLAS 2009 regulations that will come into effect early next year. In damage generation, for instance, NAPA can now handle the complexity caused by A-class bulkheads. Furthermore, horizontal escape routes can now be modelled and taken into account in calculations.

Napa has also implemented a new functionality set that produces XML output of all components, such as tables, graphics, and text, which follows the specification of DocBook - a commonly used semantic mark-up language for technical documentation. DocBook XML can then be processed e.g. into PDF documents.

As to ship hydrodynamics, the highlight of the new release is the Tahara RaNS solver, a new RaNS CFD

Solver, based on the Flowpack code of Professor Yusuke Tahara (Osaka Prefecture University). The integration of CFD code into a powerful ship design system such as NAPA really makes CFD analysis accessible to a larger group of naval architects.

# New safety measures enter into force

A raft of amendments to the Safety of Life at Sea Convention entered into force over the summer.

**A**mendments to the International Convention for the Safety of Life at Sea (SOLAS) to strengthen the fire protection arrangements on cabin balconies on passenger ships entered into force on 1 July 2008, along with other SOLAS amendments relating to the prevention of accidents involving lifeboats and protective coatings on ships.

Amendments to SOLAS chapter II-2 and to the International Code for Fire Safety Systems (FSS Code) to strengthen the fire protection arrangements in relation to cabin balconies on passenger vessels were developed in response to the fire aboard the cruise ship *Star Princess*, while on passage between Grand Cayman and Montego Bay, Jamaica, in March 2006. The fire began on an external balcony and spread over several decks.

The amendments to SOLAS chapter II-2 are aimed at ensuring that existing regulations 4.4 (Primary deck coverings), 5.3.1.2 (Ceilings and linings), 5.3.2 (Use of combustible materials) and 6 (Smoke generation potential and toxicity) are also applied to cabin balconies on new passenger ships.

For existing passenger ships, relevant provisions require furniture on cabin balconies to be of restricted fire risk unless fixed water spraying systems, fixed fire detection and fire alarm systems are fitted and that partitions separating balconies be constructed of non-combustible materials, similar to the provisions for new passenger ships.

## Lifeboat safety

An amendment to SOLAS regulation III/19.3.3.4 concerns provisions for the launch of free-fall lifeboats during abandon-ship drills. The amendment will allow, during the abandon-ship drill, the lifeboat to either be free-fall launched with only the required



Amendments to SOLAS chapter II-2 and to the International Code for Fire Safety Systems (FSS Code) have been made in response to the fire aboard the cruise ship *Star Princess*.

operating crew onboard, or lowered into the water by means of the secondary means of launching without the operating crew onboard, and then manoeuvred in the water by the operating crew. The aim is to prevent accidents with lifeboats occurring during abandon-ship drills.

## Protective coatings

Meanwhile, amendments to SOLAS regulations II-1/3-2 make mandatory the Performance standard for protective coatings of dedicated seawater ballast tanks on all new ships and of double-side skin spaces of bulk carriers.

The performance standard will apply to ships for which the building contract is placed on or after 1 July 2008; or, in the absence of a building contract, the keels of which are laid on or after 1 January 2009, or the delivery of which is on or after 1 July 2012.

Amendments to Codes and other instruments which also entered into force or became effective on 1 July 2008 include:

- amendments to the FSS Code relating to fire extinguishers, specifically portable foam applicators; fixed foam fire-extinguishing systems;

fixed-pressure water-spraying and water-mist fire-extinguishing systems, fixed fire detection and fire alarm systems for cabin balconies;

- amendments to the International Life-Saving Appliance Code (LSA Code), including those related to life rafts, lifeboats and rescue boats, particularly in relation to stowage and release mechanisms;
- amendments to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), to update the references to SOLAS regulations and to add two more chemicals to the list of products in chapter 19 (Summary of minimum requirements);
- amendments to the International Codes of Safety for High-Speed Craft (1994 HSC Code and the 2000 HSC Code), to update them in line with relevant SOLAS amendments and, in the case of the 2000 HSC Code, to revise requirements relating to testing and calculations for buoyancy, stability and subdivision;
- amendments to the Protocol of 1988, relating to the International Convention for the Safety of Life at Sea, 1974, to include in the Record of equipment for the relevant safety certificate an entry regarding the long-range identification and tracking system;
- amendments to the Protocol of 1988 relating to the International Convention on Load Lines, 1966, including amendments of a reference in regulation 22 (scuppers, inlets and discharges) and an amendment in regulation 39 (minimum bow height and reserve buoyancy);
- amendments to the Dynamically Supported Craft (DSC) Code to update it in line with relevant amendments to SOLAS;
- amendments to the Gas Carrier (GC) Code, to update it in line with certain fire safety requirements in SOLAS. **NA**



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# New free-falls rise to the surface

New research has shown that some passengers in high-drop free-fall boats can be exposed to very high G forces, especially when the boat is launched into heavy seas.

Current lifeboat regulations do not take G forces into account, and that has led to rig shut downs in some sea conditions as lifeboat capacity has had to be de-rated to suit the conditions.

However, today's problems with lifeboats, which have come to light in the North Sea over time, are leading to more stringent requirements for evacuation vessels on offshore installations, with Norwegian Authorities leading the way.

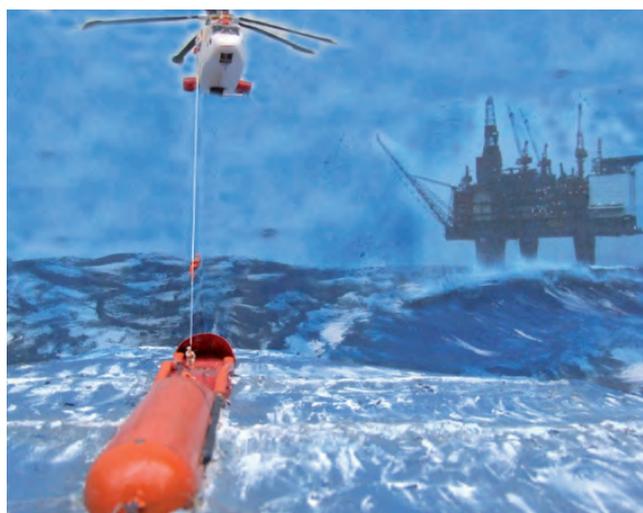
This is driving innovation among suppliers. A comprehensive programme of tests carried out by MarinTek in Trondheim is said to confirm that the Torpedo lifeboat has properties that no other free-fall lifeboat can match, for example.

The new Torpedo free-fall lifeboat has been further developed by lifeboat manufacturer Noreq AS, after the company entered into an agreement with Magnar Reigstad in July to purchase the lifeboat concept for commercial sales purposes.

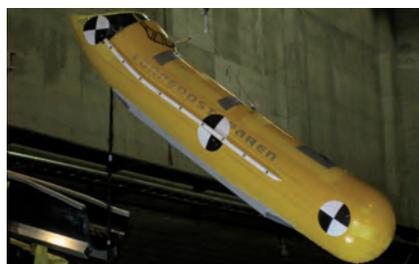
The concept has now been fully tested in model-scale by the Norwegian Marine Technology Research Institute, MarinTek. The results satisfy the new lifeboat requirements defined by the Norwegian Oil Industry Association OLF and, it is claimed, will create a completely new safety standard for personnel working on offshore installations.

Noreq said the the test results had established that:

- The design/torpedo shape means greater hull strength and increases the lifeboat's ability to withstand drops and severe weather conditions.
- The design/torpedo shape makes lifeboat drops much easier on personnel onboard.
- The design/torpedo shape means a 100% increase in the lifeboat's propulsion away from the drop site (platform/ship).
- The design/torpedo shape means it is propelled further under water. It is less affected by the drop angle, height, waves



How the Torpedo lifeboat might look in action.



Torpedo drop tests at MarinTek.

and wind, ensuring unique directional stability.

Employee representatives from StatoilHydro were present during the final part of the model-scale tests, and they had the following to say about the lifeboat project:

“Today's rescue equipment has proven to perform poorly when tested. This has undermined people's trust in the rescue equipment. As employee representatives involved in different areas of the lifeboat project run by StatoilHydro and the Norwegian Oil Industry Association (OLF), we have been a driving force for the development of new technology. We believe that the Torpedo free-fall lifeboat represents a technological breakthrough.

We are looking forward to it with great interest. We appreciate the openness shown in connection with the tests of the Torpedo free-fall lifeboat and hope that the industry will immediately make use of the new

technology that is being developed, so that it can result in better and safer means of evacuation on all our installations on the Norwegian Continental Shelf.” The statement was endorsed by Bjørn Asle Teige, YS StatoilHydro, Peter Alexander Hansen, EPN Group chief safety, and Tor Egil Løvli, SAFE Offshore StatoilHydro delegate.

As a result of these test results, Noreq said it was entering into a closer dialogue with several oil companies and owners of offshore installations, which wish to proceed with “the safest free-fall lifeboats of the future.”

## Further progression

Also making progress is Schat-Harding, which is set to launch a new generation free-fall lifeboat for the offshore industry, for which it already has firm orders. The FF1200 boat and matching davit will have a capacity for up to 70 persons and will be suitable for drop heights from platforms and other offshore units up to 33m above sea level in extreme conditions.

The new design meets all of the new OLF design criteria for lifeboats in the Norwegian offshore sector, which leads the world in offshore safety standards.

Compared to existing lifeboat designs the FF1200 has additional clearance inside the boat for safety and comfort with a more streamlined shape and powerful engine to give better headway in waves. At 16.17m long, by 3.88m wide, by 4.89m high, the FF1200 will feature a loaded weight of 30tonnes, improved structural design that will maximise canopy strength during the drop and splash in and a new seat design based on heavier workers, with an average weight of 100kg, the supplier says. Five point seatbelts will keep passengers from 1.4m to 2.1m tall safe and comfortable even with high drop heights into heavy waves.

Once safely in the sea, a high power diesel engine will deliver approximately three times the thrust of current freefall boat engines, and extensive model tests have resulted in a form which gives excellent performance in a seaway.

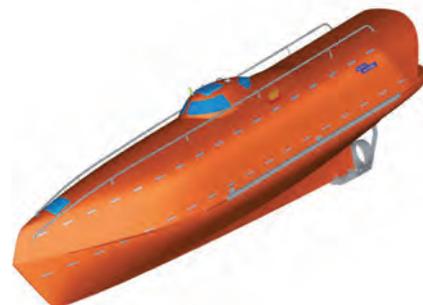
Schat-Harding has also developed new seats, safety belts and head protection for

freefall lifeboats, which will dramatically improve safety in the offshore industry, the company says.

The new seats and head restraints have been tested at the TNO Automotive test centre in Eindhoven, The Netherlands. The tests are based on a worst case scenario with waves up to 15m significant height. Seats and restraints based on the principles proven in the test will be fitted to the new FF1200 and also be available for retrofit to the FF1000 and FF48 freefall boats in service.

Schat-Harding says it hopes that changes will be made to SOLAS to account for wave heights and for larger passengers so that all freefall boats will in future meet Schat-Harding standards.

The FF1200 will be constructed from glassfibre reinforced polyester and manufactured with infusion or closed vacuum moulded techniques to ensure a strong and consistent laminate. The laminates will be dimensioned to the



Schat-Harding's latest FF1200 free-fall lifeboat design.

highest standard (ULS- Ultimate Limit State) based upon maximum loads acting when free-falling into large waves.

A full size prototype will be tested at the end of 2008. Orders for the new boats have already been received from BP Norge for the Skarv FPSO and Valhall RD, and Talisman Energy for the Yme RD. The first delivery is due March 2009. *NA*



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

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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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# Octopus meets CMA-CGM newbuilding needs

French shipping group CMA CGM has placed the order for 34 Octopus-Onboard systems for its larger containerships, whose primary purpose will be to warn against resonance.

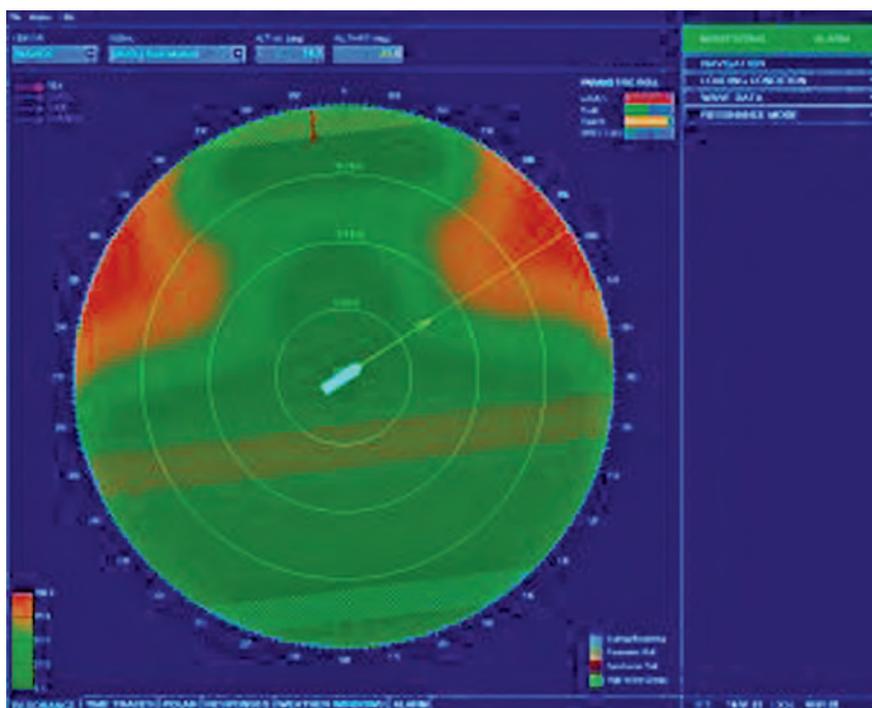
CMA CGM has specified the Octopus-Onboard system, from Dutch company Amarcon, for installation across its entire containership newbuilding programme to 2010. Amongst these ships are eight 13,300TEU capacity carriers, being built at Daewoo Shipbuilding and Marine Engineering, in South Korea.

Octopus-Onboard is designed to assist the Master in taking the best decision with respect to safe and effective ship operation. Compliance with the schedule and prevention of damage to the ship and cargo in heavy seas are decisive factors affecting the profitability of a ship. Combining measured and forecasted weather conditions with a computational model and the actual loading condition makes it possible to compute ship responses in the form of motions and hull loads. Octopus databases are ship-specific and based on 3D radiation/diffraction codes.

In essence, Octopus-Onboard is a monitoring system providing the immediate overview of the ship's actual and attainable performance in waves. It offers a forecast system providing vessel performance predictions, weather windows, downtime warnings, and simulation features, plus a routing system providing detailed voyage evaluations and optimisations taking into account the ship-specific behavior in waves.

The system collects and processes available information onboard through a sensor manager, which feeds into multi-functional and dedicated workstations, each with access to the same set of information. Having this data available, Octopus selects and displays the most relevant information to assist the officer on watch in monitoring the ship's operating point at one glance.

Expected response levels include the probability of exceeding critical levels in navigation, lashing and offshore operations. Standard results include ship motions, accelerations, hull loads and stresses, slamming and Motion Sickness Indices.



The Octopus-Onboard system, whose primary purpose for CMA CGM will be to warn against resonance.

Octopus-Onboard also offers warnings of resonance in waves for synchronous roll, parametric roll, broaching and surf riding, and electronic log books with consistent histories of navigation data, loading condition, environmental conditions (wave radar, forecasts and visual observations) and ship responses. It can provide guidance on safe speed and course in any weather condition, and offer trend analysis and online comparison with Hull Response Monitoring Systems, as well as offering guidance on optimum trim and speed with respect to fuel consumption and CO<sub>2</sub> production. Alarm messages are available on the central Ship's Alarm Management system.

CMA CGM already operates 13 vessels with Octopus-Onboard, with the first ship fitted in 2006, with an installation aboard

Rigoletto. Here, Octopus-Onboard has been connected with the ship's own loading computer, the weather forecast system and the ship's GPS and gyro. The system also features a roll/pitch motion sensor (which is optional). As well as recognizing the risk of (parametric) roll resonance, other responses like pitch, slamming, water on deck, accelerations, wave bending moments or stresses can be detected.

"It's a great step forward in safely navigate a vessel", said Master of CMA CGM *White Shark* reported after having used the system onboard a 5200TEU container carrier.

The new order for CMA CGM's complete newbuilding program follows after an extensive evaluation of the performance of the system by the CMA CGM Masters, the newbuilding department and fleet management. [NA](#)

## Ro-ro safety enters the mist

Water mist fire fighting, already established as the method of choice in the cruiseship industry, is being extended to ro-ro car decks, after Marioff claims it is now fully compliant with IMO regulation MSC.1/Circ. 1272.

**M**arioff, which is part of UTC Fire & Security, a business unit of United Technologies Corp, said that its share of the fire suppression market in the cruiseship sector was “approaching 100%”. Now, operators of marine vessels with ro-ro decks were being offered a viable alternative to conventional drench systems,

gas-based and foam-based fire protection systems, the company said.

With water mist fire fighting recognised by the International Maritime Organization’s Maritime Safety Committee since May 2008 as an equivalent technology to drench (deluge) systems for ro-ro and car deck applications, according to the

company, Marioff reckons to have found a new niche through which to make its mark.

“As soon as a fire is detected, Hi-Fog is activated, suppressing the fire before it can spread and cause damage,” said Stefan Gordin, vice-president of Marioff’s Marine and Offshore Division. “Moreover,

Perspective of a ro-ro vessel interior – now ready for Hi-Fog applications.



Hi-Fog, already widely used to protect accommodation areas and machinery spaces, offers an integrated fire protection system which reduces installation and operating costs.”

The Finnish company’s fire protection system works by spraying water mist at high velocity directly onto the seat of a fire. Hi-Fog water mist is composed of micro-droplets that measure 50microns across on average, which increases its surface area relative to its volume.

Hi-Fog uses fresh water, which is not corrosive to vehicles or ship equipment and harmless to people, the company said, although a back-up system, using seawater, could be invoked. The system uses much less water than conventional drencher systems and decreases stability problems associated with free-flowing water on deck, according to the supplier. The company said that the Hi-Fog RRS (sprinklers, wet-pipe system) reduced water flow by about 90%, compared to conventional systems, while the Hi-Fog RRD (drencher, dry-pipe system), saw a 60-70% water flow reduction. These comparisons were based on a ship with a car deck width of 30m, the company said.

Mr Gordin added: “It should also be noted that, contrary to a conventional drencher system, all water will not end up on the deck, but will stay in the air as water mist. This has not been taken into account in the above numbers.”

Moreover, given that the Hi-Fog system was more effective than drenching, less water would be used per minute, per se.

Marioff said that Hi-Fog offered the same or better fire suppression efficiency than conventional systems “without the drawbacks”.

Thus, compared to CO<sub>2</sub>-based systems, Hi-Fog did not require the standard 20-minutes for evacuation needed by what was a toxic substance, could be used in port, was harmless to the environment and did not deplete. In case Hi-Fog should be compared to foam, Mr Gordin pointed out that the Marioff product was non-corrosive, did not require foam’s extensive clean-up and was not depleted.

Mr Gordin said that, using Hi-Fog, five seconds after activation, 20litres of water mist would be unleashed to suppress fire.

He added that acceptance criteria on

## AUSMEPA recognises quality ship

The Australian Marine Environment Protection Association (AUSMEPA) recently presented an AUSMEPA certificate and AUSMEPA flag to Pics Colinares, operations manager of Oceangas Services Australia Pty. Ltd, the regional representative office of Geogas Trading S.A, recognising the quality of the safety and environmental performance of the vessel *Summit Terra*.

Neil Baird, AUSMEPA chair, said that with this step, AUSMEPA was approving the first very large liquefied natural gas carrier into its Ship Membership Scheme.

AUSMEPA uses agreed guidelines to determine ship quality and assess a ship’s potential for AUSMEPA ship membership. Records of Port State Control inspections of AUSMEPA ship members are monitored throughout the world by Right Ship Pty. Ltd.

Mr Baird said that in the event of an incident indicating a drop in safety or environmental performance, the AUSMEPA Board would assess the circumstances of the incident and decide whether AUSMEPA ship member status should be withdrawn.

Left to right are: Neil Baird (AUSMEPA Chairman) and Pics Colinares (operations manager Oceangas Services Australia Pty. Ltd, regional representative office of Geogas Trading S.A.



nozzle location had been established, bearing in mind identified gas temperatures at different locations, damage to fire load and ignition targets. Approvals had been forthcoming from Det Norske Veritas and Germanischer Lloyd, while Lloyd’s Register, Bureaus Veritas, ABz\S, and Rina approvals were pending.

With over 6000 full-scale fire tests behind

it, Hi-Fog has been fire-tested across more applications than any other water mist fire protection system and has received more industry approvals than any other water mist fire protection system, Marioff said. The system is subject to some 1400 patents granted or pending. About 1000 passenger cruiseships, ferries and other marine vessels are protected by Hi-Fog. [NA](#)

## Viking meets emerging requirements

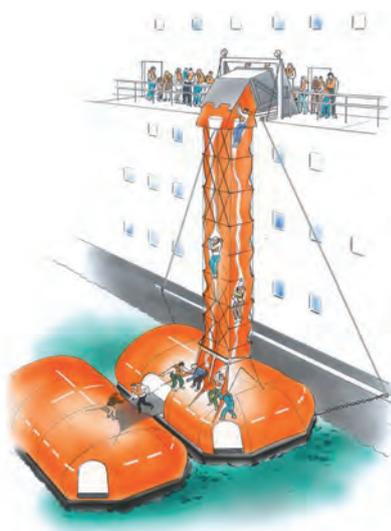
New and enhanced evacuation equipment now available from Viking to address emerging safety concerns.

The tendency to build larger, wider vessels heralds a new challenge for suppliers of marine evacuation systems, not just because they must cope with increasing numbers of passengers, but because they must also be flexible enough to cope with increased vessel trim and list.

To meet trim and list requirements, as well as evacuation capacity requirements, evacuation equipment specialist Viking has designed and built the entirely new patent-pending Viking Evacuation Dual Chute (VEDC), which it showed at the recent SMM 2008 event in Hamburg.

SOLAS-approved, and with the capacity to evacuate 559 people per system, the new dual chute can be used at heights ranging between 8.9m and 16.8m. Viking said it thus believed that the chute was the “most flexible chute system on the market today”.

“With today’s post-Panamax breadth vessels, the variation in height in trim and list conditions in a distress situation can be enormous,” said Viking global sales manager, Niels Fraende. “Only an extremely flexible evacuation system can cope with



Schematic for the new Viking Evacuation Dual Chute.

such extremes. Another unique element of the VEDC system is the float free function. Unlike other high capacity systems, the VEDC is not stored away in a large box that contains all elements. The liferafts can be

released independently from the system and used separately if necessary.”

Also on show from Viking at SMM was a new SOLAS-approved breathable constant wear suit, designed with freedom of movement and extra comfort in mind. A detachable lining with integrated buoyancy foam makes it ideal for operations in both cold and warmer climates, according to Viking.

“This is big news for those who have been looking for a flexible solution for their constant wear suits” said Viking global sales manager Jørgen Holm. “The new constant wear suit can be used as a six-hour SOLAS immersion suit or one-hour anti-exposure suit just by exchanging the thermal lining. This makes it perfect for warm and cold weather use. The new Gore-Tex Pazifik outer material with its exceptional ‘breathability’ makes it incredibly comfortable for all day use. You can also choose between several types of footwear, hood types, thermal linings and special pockets. You can build a suit that is just right for your needs.” **NA**

## New buoyancy for Cosalt

Cosalt chose SMM to launch new safety equipment, in the shape of its Personnel Recovery Device (PRD) and the Premier 2010 lifejacket, the latter being an upgrade from previous designs.

The Cosalt PRD is designed for Man Overboard retrieval situations. The device allows for conscious or unconscious casualties to be lifted from the water in a safe horizontal position, reducing the risk of further damage to the casualty. The Cosalt PRD has high density plastic rungs and steel rods and is fitted with Marine Grade 316 stainless steel snap hooks. Lifting strops and heaving lines are attached to aid retrieval.

The PRD comes in a rescue stretcher configuration, to be used with block and tackle or davit arrangements. The rescue stretcher can also be used with a rescue swimmer and comes in two different sizes. The PRD can also be used as a scramble net over the side of a vessel.

The Cosalt PRD FRC Kit comes in two sizes and is designed for use on fast rescue craft. The kit comes in a robust high-visibility valise, with hypolon patch fixing kits to attach to either side of the craft, the FRC kit is also

compact to store onboard the craft.

Cosalt’s Premier 2010 lifejacket incorporates the MSC.200(80) regulation, which will impact all lifejacket design and performance in 2010, when requirements will need to be met. The Premier 2010 lifejacket offers improved survival time with better face plane and body angles. The patented reverse angle head support holds the head in the optimum position when in water. The lifejacket also self rights in 1.7 seconds, and has a mouth freeboard of 145mm. **NA**

# New DNV safety approvals for simulators

Realism is required to meet new DNV standard on simulation

**K**ongsberg Maritime's Polaris Bridge Operation (Ship's Bridge Simulator) and GMDSS simulators have received DNV certification according to new standards laid out in DNV Class A - Standard for Certification of Maritime Simulators No. 2.14 October 2007, which is based on the requirements of STCW Convention, Regulation I/12.

The approval for the Polaris Ship's Bridge Simulator meets the standards for Bridge Operation Simulator with class notation Nautical Safety All Waters (NAUT-AW). This means it provides the highest standard for safe navigation and view from the bridge, as well as system redundancy and particular requirements for user interface in technical

equipment. In addition, the notation denotes that the ship models have extensive documentation of their manoeuvring characteristics.

The approvals are valid through 09/07/2013. The new standards have been introduced to ensure that simulators present an appropriate level of physical and behavioural realism in accordance with recognised training and assessment objectives.

"The standards in realism required to achieve the new DNV approval are very high, reflecting the graphical fidelity and computing power that is available now," says Amer Walayet, Product Advisor Ship's Bridge Simulator at Kongsberg Maritime. *NA*

## Safer means of escape with LaserLite

A safety lighting breakthrough by Chalmir Lighting will deliver advances over conventional light sources, according to its developers. LaserLite is based on a solid state laser source to provide a continuous 150m strip of lighting. Recessed into the floor or installed on the wall near floor level, LaserLite illuminates corridors and stairwells to exits. Linked to a side-emitting optical fibre cable, the LaserLite is reckoned to be particularly appropriate for oil and gas exploration.

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# Learning from aerospace

Time-triggered aerospace technology could be applied to the marine sector in the future to enhance safety. Cimac Working Group 18 is assessing its relevance.

**T**ime-triggered field buses such as the Time-Triggered Protocol (TTP) have the potential to significantly improve the reliability of modern engine control and monitoring systems. TTP enables a distributed, fault-tolerant, robust and integrated networking system for engine monitoring, engine control and other safety-critical functions.

In times of increasingly complex onboard systems, fewer crew members and unattended engine rooms, crew alert systems and more intelligent monitoring are crucial for the safe operation of ships. To interpret the huge amount of data, a robust and powerful communication platform becomes increasingly important. This also complies with the remarkable trends towards the “all electric ship”, both in commercial and naval shipbuilding.

The Time-Triggered Protocol TTP was designed for the most safety-critical applications in the transportation industry. As a consequence TTP found its first commercial application in the aerospace industry where TTP-based systems are in use for essential applications such as cabin pressure and engine control. TTP is therefore fully certifiable according to the most controller chips and DO-178B – (DO-254 for TTP controller chips and DO-178B – up to level A – for TTP-based embedded software).

TTP is the first high-speed (max. 25 Mbit/s) time-triggered field bus flying in commercial and military aircraft such as the Airbus A380, and the Lockheed Martin F-16 and soon in the new Boeing 787 Dreamliner.

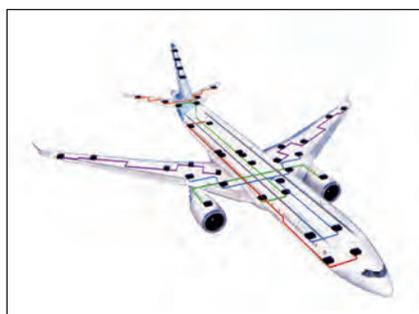
Applications in the transportation industry also include the use of the TTP-based solutions in railway signalling and interlocking systems.

## Predicable system performance

TTP is a fault-tolerant deterministic protocol that involves continuous



Cruiseships could benefit from monitoring technology first developed for the aerospace sector



Time-triggered aerospace technology for future marine engine monitoring systems?

communication of all connected nodes via redundant data buses at predefined periods of time. In TTP-based systems, all attached nodes agree a priori on the points in time when send and receive options are carried out. A communication network designed with TTP prevents an overload in the bus system even if several important events occur simultaneously. All events are safely processed according to a schedule, eliminating the dangers of data collision. Unlike event-triggered protocols like CAN or Ethernet, no arbitration and priority rules are necessary.

TTP has effective fault handling mechanisms and data consistency

services to provide maximum safety and reliability. Each node knows at any time if the transmitted messages have been properly received by all other nodes. Thus TTP ensures that all attached applications share the same information. Moreover, TTP is based on a single-fault hypothesis, i.e. any single fault at a time can be tolerated by the system. Faults are easily detected and isolated.

TTP also allows modules to be located remotely, facilitating distributed real-time control systems and networks.

## Seamless functional integration

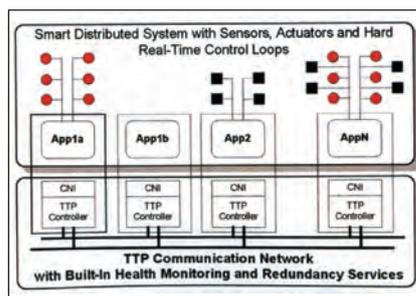
Due to its truly modular approach and partitioning capabilities, TTP facilitates the integration of independent subsystems into one data communications platform with redundant channels. These subsystems (applications) can be monitoring systems, control systems or a combination of both.

The time-triggered data communication architecture provides the independence of the various applications from the generic communication platform, i.e. the

designers of the applications need not to think about the safety and reliability of the communication network – a field in which most suppliers have limited know-how. A TTP-based ledgment, fault detection, isolation, and clique detection on the protocol level, which removes overheads and enables use of low-cost processing hardware.

### TTP in maritime

TTP provides a standardised and cost-efficient platform for the fully distributed engine room control systems. This control architecture distributes functions across the entire network, thereby increasing system capabilities and enhancing operational performance. Various monitoring systems from different suppliers (e.g. engine vibrations sensors, oil mist detectors, smoke and fire detectors etc.) can be combined in one platform which reduces the number of false alarms and helps to increase dependability. TTP's redundancy management on the protocol level can automatically filter out incorrect messages of redundant sensors in real-time which may otherwise cause alarms. Redundancy can be easily tailored to meet system safe and availability requirements. Moreover, by integrating different monitoring systems and combining the sensor data, intelligent software can assess the overall criticality of the situation and, if necessary, avoid alarms caused by contradictory measurements of one faulty subsystem. Thus, TTP-based



TTP communications network with built-in health monitoring and redundancy services.

engine room monitoring systems can assist the crew in interpreting and assessing critical situations faster.

A welcome side-effect of TTP-based platforms is the replacement of many point-to-point wires, and thus the reduced overall complexity of the monitoring systems. Moreover, it allows complete integration of control and monitoring systems without adding layers of system complexity.

### Concurrent complexities

One of the most difficult issues in the design and implementation of dependable real-time systems is the seamless integration of electronic subsystems, developed by different suppliers or groups, into an overall computer system. System integrators have a pressing need for a 'composable' network architecture that provides a clear separation between the system issues and subsystem issues. Safety and fault tolerance make this problem even more challenging.

Consequently, the design process for TTP-based systems follows a two-stage approach, allowing easy integration of applications from different suppliers. The system integrator (e.g. the supplier of the integrated monitoring and crew alert systems) determines the overall system design and defines the interfaces between the various subsystems can then design their applications completely independent from each other. This design approach guarantees a smooth final integration. The TTP data bus maintains independent among the system modules. Modules can therefore be changed and upgraded without affecting other modules.

A comprehensive software tool chain that allows easy and efficient design for both system integrator and subsystem supplier is available.

TTTech Computertechnik AG is the leading supplier of solutions in the field of the time-triggered computer systems. TTTech's products comprise a complete software development environment for TTP-based systems, including hardware as well as TTP chip models. Standard software and hardware solutions are complemented by worldwide product and project support to efficiently develop and implement distributed embedded systems. TTTech is AS9100-certified for the software development of safety-critical applications in the aerospace industry. Beside TTP, the subsidiary TTTech Automotive, provides solutions for the upcoming automotive standard FlexRay. **NA**



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MARINE EQUIPMENT TRADE SHOW

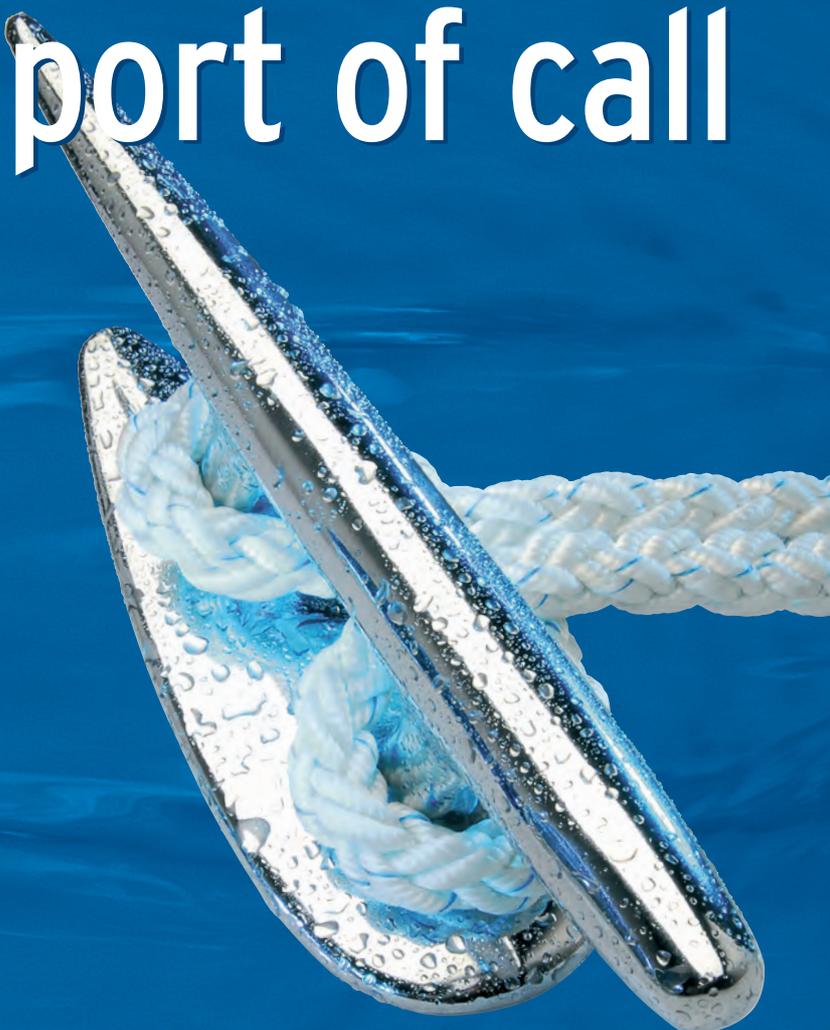
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# Cleaning up in safety

Recent concerns over personnel safety in cleaning situations onboard vessels, with reports of injuries and even deaths whilst working in tanks, has raised interest in other ways of approaching a dirty job that needs to be done.

Personnel entering tanks with clean-up in mind face continuing health risks, but Alfa Laval says its Gunclean Toftejorg tank cleaning solution and Toftejorg Sanijet 20 Rotary Jet Head offer new levels of safety.

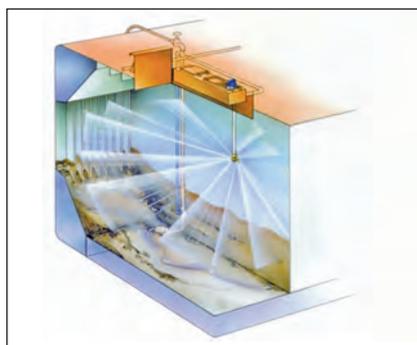
The Gunclean Toftejorg meets specific shipowner requirements, with a range of different nozzle systems that come with a fixed or portable system.

The cleaning pattern is performed using rotary jet nozzles, which have been designed to optimise jet spray performance with pressures as low as three bar. The cleaning cycle can run from four to eight cycles and only takes a few minutes to complete. The first cycle lays out the pattern, which the following cycles follow, creating a denser cleaning pattern. This achieves a scrubbing action of the surface. Running this application speeds up turn around times and reduces time in port.

The package includes analysis of situations that are bought to Alfa Laval by shipowners, with this information run in simulations using G-Pass and Trax software systems. The G-Pass software program assesses the shadows/areas in the tank that are not covered when the cleaning process is continuing, which is based on position and reach of a single jet of cleaning solution. This information is then turned in to a set of 3D shadow diagrams, which meet International Marine Organization and Class requirements.

The Trax software builds on the data from G-Pass by running simulations and evaluating the cleaning pattern, cleaning time and consumption of cleaning fluid to the desired effect. TRAX will compare results from tank cleaning information between different types of systems to evaluate which system is best for each shipowner. Combined with the data from G-Pass, Alfa Laval can then recommend the best machine and type of nozzle head – which comes in two or four nozzle versions – and also the positioning of the nozzles.

The Toftejorg Sanijet part of the Toftejorg range is a rotary jet head device that cleans

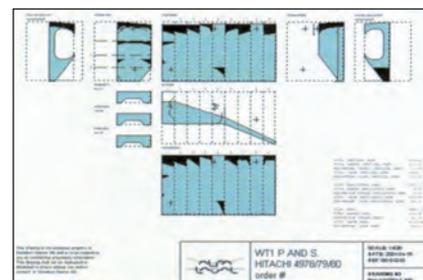


Alfa Laval offers flexible tank cleaning solutions for all shipyards.

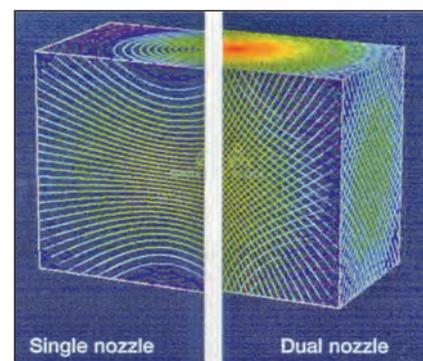
in a 360degree indexed pattern. This jet head is designed to be a permanent fixture in any cleaning set up but designed to be as compact as possible in design. For instance, the drive for this cleaning head is positioned outside of the tank. The head is self-cleaning and self-draining, along with the down pipe which is also self-cleaning. All contact surfaces of this product are either stainless steel or FDA-approved polymer. This product is suited for smaller tanks ranging from 0.5m<sup>3</sup> to 30m<sup>3</sup>, and carrying highly viscous, foaming or thixotropic products, where cross contamination must be avoided.

The Toftejorg Sanijet 20 operates the 'Golden Section' cleaning pattern, patented by Alfa Laval. This pattern means that the distance between the tracks removes residual product and allows for a quick cleaning sequence, according to the supplier. It is available in either media-driven or motor-driven unit; the motor-driven unit comes with a magnetic clutch that prevents leakage through transmission. The air-motor version comes with variable speed adjustment allowing it to run at slower speeds and for working in hazardous conditions where jet flow may need to be slower. **NA**

Meeting the highest standard in sanitary cleaning: The Toftejorg Sanijet 20, rotary jet head device that uses the patented 'Golden Section' cleaning pattern.



High Cleanliness Standards: Shadow diagrams meet International Marine Organization and class requirements.



Single nozzle or dual nozzle? Trax determines the optimal cleaning method.



# Russia finalises shipbuilding plans

The main shipyards in Russia are finalising plans for expansion. *The Naval Architect* looks at recent events in a changing maritime Russia, and at shipyard-related activities of one major research institute. Henrik Segercrantz reports.

The United Shipbuilding Corporation (USC or OSK) was set up by the Russian Government last year, with the purpose of building up a centrally-led strong shipbuilding industry in Russia, after the example set by the United Aircraft Corporation, which has successfully integrated much of the civil and military aircraft industry.

USC was registered in St. Petersburg in November 2007, and is now in the process of uniting the state shareholdings in shipyards and design institutes. USC is also restructuring the scientific research institutes and local ships' equipment manufacturing.

The goal is to create a world class naval and merchant shipbuilding and ship equipment manufacturing industry in Russia. By the end of this year, plans are to be completed covering shipyard development investments, including their financing. This also implements plans for what is to be produced, and where, over the coming years, and also plans on the development of the businesses of the main domestic suppliers.

USC is divided into the Western, Northern and the Far East Centres of Shipbuilding and Ship Repair. In May, Deputy Prime Minister, Igor Sechin, replaced Sergey Naryashin as the chairman of USC, in a move by Prime Minister Vladimir Putin designed to speed up the organisation of USC. Mr Sechin is also chairman of state oil giant Rosneft, and is in charge of overseeing Russia's energy sector. Mr Naryashin moved over to the President's administration.

In July, Mr Sechin named Vladimir Pakhomov, first deputy chief executive of state-run arms dealer Rosoboronexport, as the president of USC.

In a recent meeting on shipbuilding in St. Petersburg, Mr Putin noted that in

the past 10 years only six percent of ships ordered by Russian owners had been built in the nation's docks.

Sovcomflot, recently merged with Novoship, is to participate in the board of USC, and as a condition for the merger was to (continue to) place shipbuilding orders with Russian shipyards.

The Federal programme of USC is valued at some RU136 billion (US\$5.32 billion), of which RU90 billion is to be allocated from the state budget and for which private Russian equity is also being sought.

“The current economic recession should not influence long term decisions, but it might still reduce the current enthusiasm for fast growth”

There are some 40 shipyards in Russia, most of them small in size. Over recent years, the main shipyards in Russia, all of which are situated in north western Russia, have seen much restructuring and ownership changes. In general, they have suffered from a lack of financial resources, which has delayed much needed modernisation.

The plans set for USC involve a new level of 'ultimate' power, however and, combined with the increased financial muscle of the country as a whole that derives from oil and gas revenues, shipyard refurbishment plans have been accelerated once more.

There are also a number of plans for setting up entirely new shipyards, in order to gain an attractive position for the expected centrally-coordinated allocation of the various vessel types among the yards.

Russia's expanding activities in oil and gas exploration, production and transportation in Arctic waters is one of the major driving forces in this respect. For the time being, as plans are being finalised, no final decisions on products and rights to build new yards have yet been published. There are many competing interests, which are promoted in various ways. Differing from current practices at many yards, a newbuilding yard would be a modern assembly shipyard modelled on the best examples in Europe and Asia.

Some major changes have taken place, though, and some important decisions have been made, including the placement of some important ship orders, through which one can begin to see a possible future structure of the shipbuilding industry in Russia.

## Strategy for 2020

According to the “Strategy of Developing the Shipbuilding Industry Through 2020 and Beyond”, the Russian government has recognised the development of the following types of civil maritime technologies as priority tasks:

- Offshore platforms and special equipment for developing offshore oil and gas reserves, including underwater and under-ice complexes;
- Advanced scientific research vessels for geophysical, geological, oceanological, meteorological, biological and other studies in the world's ocean, including the Arctic;
- Offshore techniques for power generation in littoral areas of the Arctic and Asia, including renewable energy



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- sources (tide, current, wind), and gas processing in these areas for maritime transportation;
- New types of engines, energy generators, ancillary power equipment, automatic control systems and other high-quality equipment for ships, including electric drives for ice-resistant vessels and icebreakers;
- LNG carriers for Arctic regions;
- Large-capacity ice-resistant tankers that would ensure saving 10%-15% of energy consumption; a 20%-25% increase of ice navigation qualities; and a 20%-40% increase in economic efficiency for oil

and condensate transportation from the Kara Sea;

- New-generation atomic icebreakers with improved navigation and maintenance qualities.

The Economic Development Ministry has forecast that the output of Russia's civilian shipbuilding sector is expected to increase to RUB151.3 billion by 2020, up more than five times from the output last year.

It is most probable that the decision will be made next year on building two new big shipyards in Russia within the Gulf of

Finland, one in St. Petersburg at the site of Severnaya Verf (Northern Shipyard) and one in the area of the oil export port of Primorsk, with the owners of Vyborg Shipyard and also OJSC Finance Leasing Company strongly involved. United Shipbuilding Corporation will have shareholdings in both shipyards, and cooperation with the yards recently acquired by Russian interests in Germany seems probable.

The current economic recession should not influence long term decisions, but it might still reduce the current enthusiasm for fast growth. *NA*

## Russia takes on German yards

In line with Vladimir Putin's recommendations for companies in Russia to increase their direct assets abroad, state-run OJSC Finance Leasing Company affiliate FLC West, acquired a 70% majority share of Aker Yards' two German shipyards.

**F**LC is heavily involved in developing the leasing financing system for shipbuilding in Russia, while FLC West has been established in a 50-50 joint operation with Cypriot interests to invest in industries of strategic importance for Russia.

The shares of Aker MTW Werft GmbH, the direct and indirect owner of shipyards in Wismar and Warnemünde in Germany, and the shares of Warnow Design GmbH were initially transferred to Aker Yards Ukraine Holding AS, the owner of the Okean shipyard in Nikolaev in Ukraine, a joint venture established by Aker Yards and Damen Shipyards in 2006. The price for the 70% shareholding acquired by FLC West was €291.9million, assuming a zero debt – and a zero working capital total price of €417 million for the new yard group.

Through the acquisition of the modern German yards, Russia has gained perfect models for its planned new domestic shipyards, and also offers Russian shipowners the possibility to build ships 'domestically although abroad'. Currently under construction in Germany is a series

of Arctic multipurpose (double-acting) containerships for Norilsk Nickel, the

*"It remains to be seen how the new owners are going to handle the high shipbuilding costs at German yards"*

first vessel of which was recently handed over. The prototype vessel in the series, *Norilsk Nickel*, was developed in Finland, and was delivered from Aker Yards' Helsinki shipyard in spring 2006.

It remains to be seen how the new owners are going to handle the high shipbuilding costs at German yards, which has negatively affected their global competitiveness in their main containership construction sector. It also remains to be seen whether future LNG

carriers will be built in Germany, or, as expressed by so many in Russia, at a new purposely built shipyard in Russia. Germany might still provide the cheaper option.

### Enter or exit STX?

Concurrent with the announcement of the sales of Aker Yards' German shipyards to Russian FLC West, Aker Yards (today STX Europe) and FLC West said they were negotiating with United Shipbuilding Corporation, Gazprom Neft and Summa Capital - the latter two controlling and operating the port of Primorsk - to establish a US\$1 billion shipyard in Primorsk. They said they were also negotiating with the owners of Vyborg Shipyard. According to Kommersant, quoting FLC West, (then) Aker Yards and FLC West would be satisfied with a blocking minority shareholding in the new yard. The new yard would be part of the shipyard group of United Shipbuilding Corporation. No new information has been received on the project since STX took over Aker Yards. *NA*

# Thank CRIST for shipbuilding

Behind the design of most of Russia's (and the former Soviet Union's) existing shipyards, shipyard upgrading, and also new shipyard plans, is the St. Petersburg-based Central Research Institute of Shipbuilding Technology (CRIST), established back in 1939.

**C**RIST, which has the status of Federal state unitary enterprise (FSUE), is participating in the development work of new yard facilities at the Northern Shipyard and the Admiralty Shipyards. In addition, it participates in the new yard being planned by Vyborg Shipyard and others to be set up in Primorsk. It has also made yard developments and new plans for the Baltic Shipyard, and also for Sevmach in Severodvinsk, near Archangelsk.

As is common for many Russian maritime institutes, the activities of CRIST are diversified. In addition to research and various development projects of both commercial and navy shipyards and other maritime related manufacturing or servicing, CRIST is also developing and producing shipyard equipment for blasting, steel cutting, bending, and welding, including automated systems.

In addition, CRIST handles part of the maritime education of the Marine Technical University of St. Petersburg. It is also specialised in designing, and operating equipment for decommissioning of radioactive nuclear power plants and handling and storage of the fuel of nuclear powered icebreakers and submarines as well as their dismantling.

CRIST produces various shipyard process lines including equipment for hull construction, plate cutting and bending, welding, blasting, panel manufacturing and outfitting, including the outfitting of piping systems and pipe bending machinery. It also specialises in automation processes, including that of welding and in developing and implementing design and manufacturing software as well as systems for technical and business process documentation. For simulation modelling, GPSS World 2000 is used. Software used for 3D design includes Catia Solutions V.5, Unigraphics NX and AutoCad 2000/2002, whereas 3D

The Central Research Institute of Shipbuilding Technology is developing new welding equipment for adaptive automatic welding. Single-pass welding with transverse hill method and adaptive self-regulation is applied. Benefits claimed include no human factor impact on welding quality, guaranteed quality level including also guaranteed reliability of products inaccessible for periodic certification.

Max Studio is used for process animation. The institute also develops systems for CAD/CAM/CAE purposes.

## Commercial transformation

The Institute is currently being transformed into an open joint stock company and is to be renamed Centre for Shipbuilding Technology and Ship Repairs, which will include shareholdings in some plants, including Burevestnik Armatur (51%) and a minority holding in the Proletarsky factory. It will still remain outside of United Shipbuilding Corporation, although it participates in the development and strategy planning of its shipyards.

CRIST has outlined its tasks for the coming years until 2016. It aims at producing new shipyard technologies for the production of 150MW to 200MW icebreakers, LNG carriers, new types of automated vessels for fishing, and the development of nano-modified and hybrid composites for various tanks for storage and transportation of hydrocarbons, as well as technologies for the construction of big steel structures and tanks made of nitrogenous steel for hydrocarbons for offshore vessels for cold and corrosive environment. It also aims to develop new casting and production methods for armatures, using high strength nitrogen steel casting in various mediums, with pressures up to 40MPa to replace bronze, copper and titan castings.

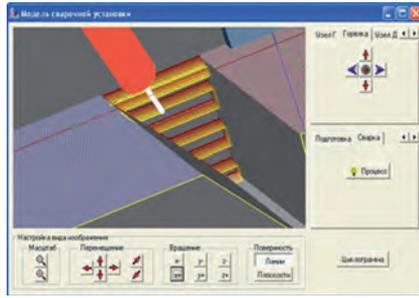
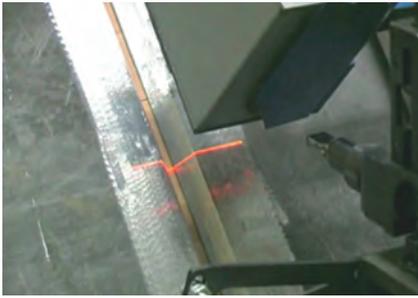


Semi-Automatic Plasma-Arc Welding of Aluminum Alloys.

CRIST claims the following advantages for its technology:

- 1.5 to 2 times increase of labor productivity;
- a 20 to 25 percent reduction of needed labor input on the manufacture of welded sheet constructions
- reduction of consumption of electric energy and welding materials by 10 to 15 percent

CRIST has developed and implemented an efficient technology for basic upgrading of river vessels, in order to provide another 10 years for what is an ageing fleet. Already, 12 Volga Neft -type vessels have been upgraded at shipyards in Rybinsk, Volgograd



Automated welding of panels with defected edges have been developed as well as automated welding of thick plates up to 100mm.



Pipe processing plant.



and at Nefteflot in Samara. The cost per vessel, of project 1577, was less than US\$1 million, compared to some US\$7 million for a newbuilding. Leaking tank and piping structures can be repaired while the vessel is in operation, using a new expanding insulation material, the application of which has also been developed. In addition to the small cost, with a payback time of seven months, the extended 10 years of life has been valued at US\$1.8 million per vessel.

The Institute has delivered more than 1000 automated plasma- and other cutting machines. There are three basic types of products offered:

- plasma-, oxygen-, and laser cutting and marking equipment and plate edge cutting,
- light weight equipment
- console equipment.

Defective welding.

Another product line is for plate bending and straightening. A new product is rotation bending machinery which can handle all plate bending tasks at a shipyard. The 250kN unit, type MGPS-25M, can handle plates with a thickness of up to 20mm. CRIST also produces a big 100kN unit for bending plates and profiles up to 30mm.

The Institute is focusing on the development of welding machinery for more complicated tasks, and is developing new welding equipment for adaptive automatic welding of plates, structures and pipes. Steel up to 100mm thick can be welded. Single-pass welding with transverse hill method and adaptive self-regulation is applied. Benefits claimed include no human factor impact on welding quality and guaranteed quality levels, including guaranteed reliability of products inaccessible for periodic certification. Automated welding of panels with defected edges has also been developed.

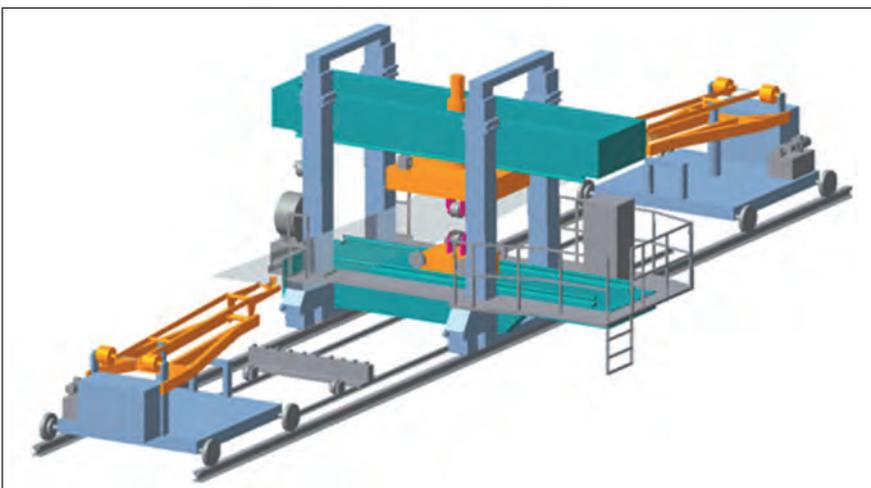
Another product is semi-automatic plasma-arc welding equipment for (1mm-6mm) thick aluminium alloy plates.

CRIST also produces pipe processing plants including technologies for assembly of non-welded shipboard pipelines as well as pipe bending equipment, with high frequency heating.

The Institute has also developed equipment for shot-blasting and other special needs, such as nuclear fuel handling and rubber coating removal.

A method has been developed for plasma-coating of worn out diesel engine valves, shafts and various rotating products up to 6m in length and 1m in diameter and with a maximum weight of 2500kg, extending the product lifetime up to 1.5 times. *NA*

Auto-bending and straightening.



# Marine Cables for all purposes



Picture: MAP



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A Nautical Institute project sponsored by Lloyd's Register Educational Trust



## The International Human Element Bulletin

**Issue 18** of Alert! focuses on seafarer health, safety and wellbeing.

Article IV of the Maritime Labour Convention 2006 emphasises the rights of every seafarer to a safe and secure workplace that complies with safety standards; to fair terms of employment; to decent working and living conditions on board ship; and to health protection, medical care, welfare measures and other forms of social protection. The shipowner or shipmanager has a duty, therefore, to provide a safe and secure working environment, decent working and living conditions and fair terms of employment for their seafarers.

In this issue, we address what can be done to improve seafarer health, safety and wellbeing, which includes a centrespread A to Z guide.



**Issue 18 is now available from [www.he-alert.org](http://www.he-alert.org)**

# Energy behind Northern Shipyard expansion

Having recently turned its hand to the offshore supply vessel sector, Svernaya Verf has big plans to service the growing energy sector.

Last year, at the Neva exhibition, Andrey Fomichev, director of shipbuilding at the United Industrial Corporation (UIC) and general director of the Severnaya Verf (Northern Shipyard), said that his company had proposed to build a range of vessels for Gazprom for offshore field developments. The company is to launch a new shipyard at the site of the Severnaya yard. The plans for Severnaya Verf, as well as those Baltic Shipyard, were proposed for the board of UIC last autumn. The new shipyard construction is to be kicked-off as soon as UIC receives government approval.

The new covered dry dock of the 'Supershipyard' is to measure 360m x 55m. A special department is to be set up to build liquefied natural gas carriers. The plan is to launch the yard, covering an area of 100hectares, in 2010 and to begin building 150,000m<sup>3</sup> LNG carriers and tankers of up to 300,000dwt by 2013.

The yard signed a cooperation agreement covering LNG carrier construction with Daewoo last spring. *The Naval Architect* has also learnt that LNG tank experts at former Aker Yards (now STX Europe) are among those consulting the Severnaya Verf.

According to Andrey Vorobiev, head of marketing, the yard is considering the possibilities to build any types of LNG carriers, with the decision on type decided by the client. "We are now conducting negotiations with leading designers and manufacturers, not just Daewoo, but with Mitsui, Mitsubishi, Samsung etc, as well as with LNG shipping companies regarding types of cooperation in this area," he said.

The plans at the Severnaya Verf include both upgrading and increased automation. The plans are to upgrade existing production facilities for part production and hull assembly with new production lines fitted with automated welding robots, in order to increase labour efficiency by two to two and a half times.

The planned annual throughput of the yard will be some 500,000dwt. In addition to LNG

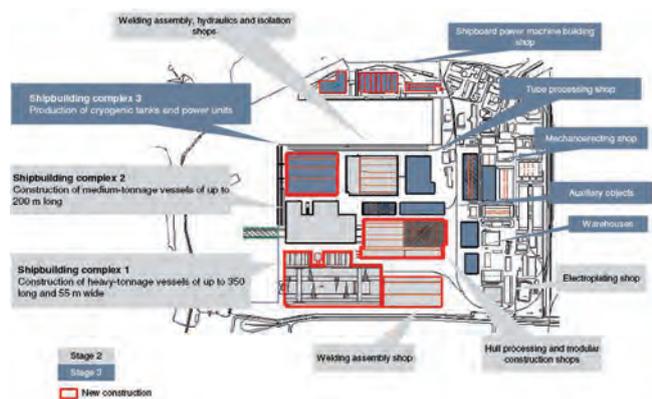


Severnaya Verf recently received its first orders for complete turn-key delivery of supply vessels. Picture shows hull construction in the covered building dock.

carriers, offshore vessels but also rigs for Gazprom, ice-class tankers, and research vessels are planned to be built at the new yard, while icebreakers, including nuclear powered ships, were originally included in the plan. The estimated cost of the project is RUB18 billion (US\$705.2 million), with credits planned for RUB13.7 billion.

State-owned USC holds a 20.96% stake in UIC's Severnaya Verf.

Currently the yard has four covered building sites, two slipways, and three open smaller slipways. The yard also has a floating dock with a capacity of 169m x 29m/10,000tonnes. In the covered building docks, arranged with



The original time schedule for the construction of the new yard. Latest information suggests that the start of production is set for 2013.

heating, the yard can build vessels up to 170m in length and 20.5m wide. There are two bridge cranes with a capacity of 50tonnes. Blocks weighing up to 180tonnes are transported into the covered building docks by trailer, while a transferring platform has a capacity of 4800tonnes. Ships are completed to some 85%-90% before launching and final

outfitting at the two outfitting quays, 576m and 200m in length with a water depth 10m and 12m respectively.

### Main products today

Main products today are vessels for the Russian Navy and for clients abroad. The orderbook includes a frigate (P-22350) and three corvettes (P-20380), and the yard is expecting additional orders for three corvettes, one frigate and a communication vessel for the Russian Navy. Further frigate and corvette orders for export have been discussed including frigates for India (P-11356). The flagship frigate for Russia is to be delivered by 2010.

In 2005, the yard signed a letter of intent with Sovcomflot to build multi-purpose dry-cargo vessels and 10,000m<sup>3</sup> liquefied

petroleum gas carriers, but these projects have not materialised. A series of 19,000dwt container carriers were also discussed at the time.

Earlier, the yard built tankers, bulk carriers, timber carriers, containerships, passenger and fishing vessels, tugs, ferries, and floating docks, as well as research vessels and ro-ro vessels. The yard has also been engaged in building river-sea vessels and in repairing Russian and foreign navy vessels.

Nonetheless, the current total orderbook at Severnaya Verf is valued at more than RUB40 billion to keep its 1300-strong shipbuilding staff busy. At present, the shipyard can build vessels of up to 15,000dwt. It recently broke new ground in terms of ship construction, delivering two platform supply vessel hulls for Norwegian Eidesvik

Drift AS and Farstad Shipping. The 73.5m x 16m, 2500dwt vessels, with a hull weight of 1330 tonnes, partly outfitted, are of the Vik-Sandvik AS VS470 PSVMkII design. The vessels were completed at the Westcon shipyard in Norway.

The hull for a third vessel, a platform supply vessel for Siddis Skipper AS (type VS470 PSVMkII) is currently under construction. In February this year, the yard received an order for the same owner for a complete turnkey delivery of two VS485 PSVMkII vessels. This first supply vessel, which will also be outfitted at the yard, is due for delivery in the end of May 2009.

According to Mr Vorobiev, the yard can build and deliver two completed vessels of type VS470 PSV 22 months after the signing of the contract. **NA**

## Yards await streamlined approach

Plans to shift shipbuilding away from downtown St. Petersburg appear to have been put on ice.

**U**nited Industrial Corporation, UIC, or in Russian OPK, (the name of which is not to be mixed up with state-owned United Shipbuilding Corporation, USC or OSK), is the majority owner of both the Northern Shipyard (JSC Severnaya Verf) and the Baltic Shipyard (JSC Baltiyskiy Zavod), both situated in St. Petersburg. UIC is a subsidiary of Mezhprombank, controlled by Sergei Pugachiov. The Russian Government has the ultimate control of the decision-making at the yards. Both of the yards are situated in central St. Petersburg.

Until very recently, OPK had been developing plans to cash in on the Baltic Shipyard's location, sell the 70 hectares of land for real estate, which was valued at US\$140 million, and transfer the activities to the nearby Severnaya Verf shipbuilding area, where a completely new big shipyard facility was envisaged. Until a year ago, the plan was to continue operations at the Baltic Shipyard until 2012. But Baltic Shipyard has many friends in the city, and the government. High level Federal officials, including the mayor of St. Petersburg and representatives of UCS, recently spoke

against the move, effectively nipping the plans in the bud.

Recently, USC said that it planned to form a joint-venture with UIC. These negotiations supposedly propose inclusion of Severnaya Verf in a joint-venture, with the state contributing the Sredne-Nevskiy Shipyard, a current major sub-supplier yard to Severnaya Verf.

Whatever the outcome, it is known that USC should be in operation by 2009, as ordered by Prime Minister Putin, and that the plans on the organisation of shipbuilding should be completed within this year. **NA**

### The Principles of Naval Architecture Series: *Strength of Ships and Offshore Structures*

by Don Liu and Alaa Mansour

edited by J. Randolph Paulling



This fall The Society of Naval Architects and Marine Engineers will release the first in the long awaited revisions of its premier reference work, *Principles of Naval Architecture*. The new volume, *Strength of Ships and Offshore Structures*, brings up to date the treatment of many ship strength topics including the latest developments in dynamic sea load predictions, structural safety using reliability concepts, fatigue assessment, ultimate strength, mechanics of collisions and grounding, high speed craft, and much more. A must-have reference for anyone involved in naval architecture.

To purchase log on to [www.sname.org](http://www.sname.org) or contact Tommie-Anne Faix at [tfaix@sname.org](mailto:tfaix@sname.org) or 1-201-499-5068

# 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.

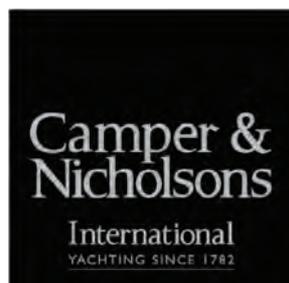
Introduced with great success in 2008, the World Superyacht Young Designer Award competition provides a showcase for young designers to demonstrate their ability and talents, and encourages the development of the next generation of superyacht designers.

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](mailto: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](http://www.rina.org.uk/wsyaward)

# Baltic Shipyard builds à la carte

Baltic Shipyard shows itself able to build a wide portfolio of complex vessels.

No dividends have been paid by Baltic Shipyard (Baltiyskiy Zavod) for the last two years. In 2007, the company's revenue totalled RUB3.5 billion (US\$137 million), but the company made a net loss of RUB540,000, as its own capital was required to finalise the icebreaker *50 Years of Victory*.

Now, new capital of RUB264.44m has been issued. United Industrial Corporation controls 88.2% of the company. The state participates with a controlling 'golden share' in the company, and sits on the shipbuilder's board.

Meanwhile, the yard has an orderbook valued at RUB10billion with deliveries until 2010, general director of the Baltic Shipyard Aleksandr Chistov, recently said.

Baltic Shipyard is still the only yard in Russia capable of building ships up to 100,000dwt. Its 350m long slipway is the biggest in Russia. Its above water length is



Latest launch from St. Petersburg-based Baltic Shipyard.

## TECHNICAL PARTICULARS

### Main particulars of the second line diesel-electric icebreaker *Sankt-Petersburg*, launched in May.

Navigating area: .....	unrestricted
Operation area: .....	Baltic Sea
Operation conditions: .....	water temperature -2deg C - +32deg.C
ambient air temperature: .....	-30deg +35deg.C
Length overall: .....	114.0m
Breadth overall: .....	27.5 m
Depth: .....	12.4 m
Draught: .....	8.5 m
Deadweight: .....	6430tonnes
Gross tonnage: .....	9600gt
Total output: .....	21 MW
Azimuthing thruster output: .....	16 MW
Speed: .....	16knots
Crew: .....	20
Classification society: .....	Russian Maritime Register of Shipping (RS)
Class notation: .....	KM JJI6 (2) A1 II1 (KM Icebreaker 6 (2) AUT1 EPP FF1 - according to the new symbol system.

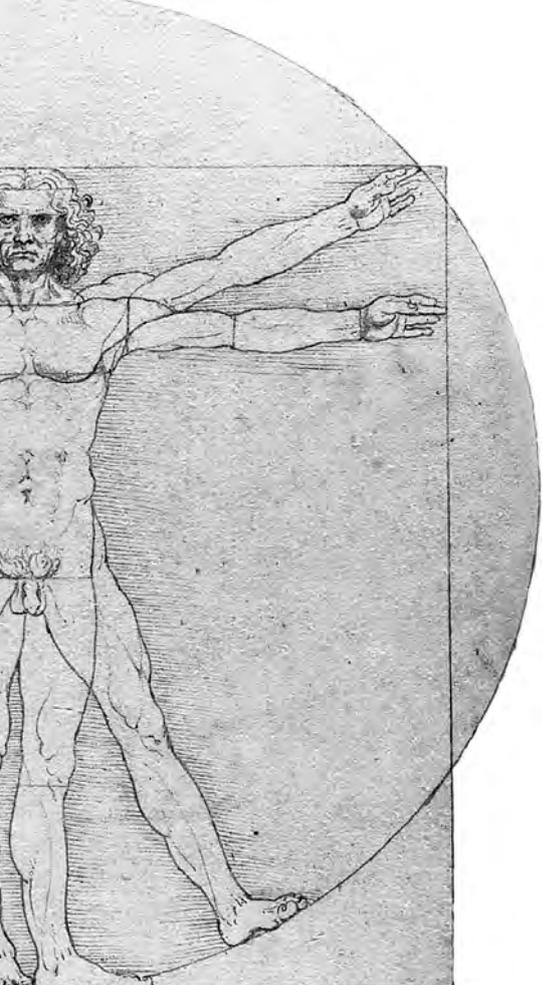
263m and underwater part 80.4m. The width is 36m. There is another open 245m slipway with above water part of 192m and a width of 32.6m. They are respectively served by five and six gantry cranes and have a 40,000tonne and 12,500tonne load capacity respectively. In addition the yard has a covered 168m x 31.2m slipway, and a deep draught outfitting berth.

In 2005, a new panel line was built including steel cutting and profile manufacturing. The design work was done by the yard together with CRIST and German company IMG GmbH. New painting halls were also completed in 2005, and new milling machines and lathes have been acquired to increase the efficiency of machining of shafts, stern tubes, valves and other articles produced by the yard.

Among the references of the yard are many complex vessels, including nuclear powered icebreakers and naval vessels. In 2004, the yard completed three frigates for India, but has since not received follow up-orders. Also in 2004 the yard delivered two chemical and oil product carriers for German company Transocean Shipmanagement, as well as six river chemical and oil product tankers for

Dutch company Rensen Shipbuilding B.V. After having received new financing for the two decades-old construction project, the yard delivered the 75,000hp nuclear powered icebreaker *50 Let Pobedy (50 Years of Victory)* in spring 2007.

In 2004 the yard received the order from state-owned RosMorPort for two line icebreakers intended for escorting up to 50m wide tankers in the Gulf of Finland on the route to and from Primorsk, firefighting, rescue and salvage operations, and deck cargo delivery. The first of these icebreakers, *Moskva*, was launched in May 2007, and was originally due for delivery later that year. The second vessel, *Sankt-Petersburg*, was launched in May this year. Both icebreakers are now scheduled for delivery by the end of this year. The keel laying of *Sankt-Petersburg* took place in January 2006. The LU6 class vessels are each fitted with two Steerprops mechanical azimuthing propulsion units, each with a total power of 8.2MW. The icebreakers are designed to break over one metre thick ice at a speed of 5.5knots. The helicopter deck is designed for a Ka-32 or Ka-226 helicopter. The first icebreaker is valued at RUB2.7 billion (US\$106 million), and the value of



# Human Factors in Ship Design and Operation

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



## Second Notice

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



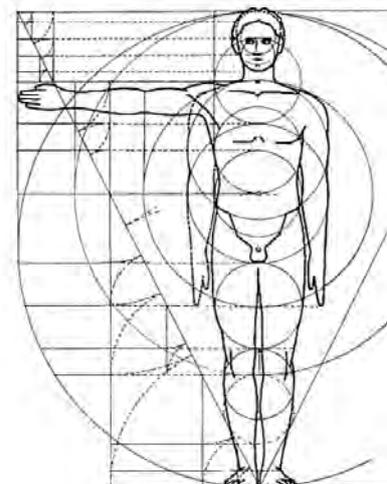
With ever more complex systems and technology greater improvements in safety can be achieved through a better understanding of human/system dynamics. A greater awareness of the role played by management structures, culture, procedures and regulation in safe and effective operation.



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



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

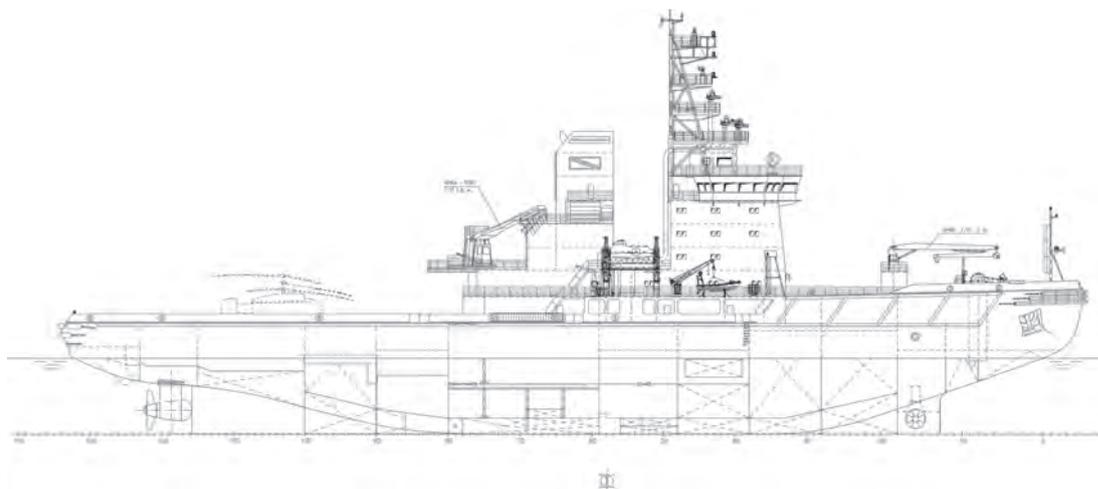


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Icebreaker due delivery from Baltic Shipyard.

the total order is RUB5billion. RosMorPort is planning to continue the series with two more icebreakers, for work in the expanding Russian port of Ust-Luga in the Gulf of Finland.

Then, in 2005, the yard received subcontracted orders for the hulls of two ro-ro passenger ships for Stena RoRo, to be built to the improved Stena RoRo Seabridger-class design. The 8000gt vessels, *Stena Trader* and *Stena Traveller*, were completed by Norwegian Fosen Shipyard in 2006 and 2007.

The yard is currently building a trawler for a Russian owner. It also recently completed, for Vyborg Shipyard, the construction of six steel blocks for the columns of a semi-submersible drilling platform of type Moss CS-50 for Sea Dragon Offshore. The total weight of construction was about 800tonnes. The yard also built blocks for the oil loading platform Varandei in the Pechora Sea.

Baltic Shipyard is also a major producer of non-ferrous and core-mould castings. It is producing propeller blades for two Azipod units for the *Oasis of the Seas* cruise vessels under construction in Finland and also for other cruiseships, in a subcontract from Zvezdochka yard, in Severodvinsk. It has also produced propellers for Schottel. Baltic Shipyard has also built passenger ship grand blocks for yards in Finland. Last spring, the total engineering orderbook at the Baltiysky Plant was some RUB4.5 billion.

The Russian nuclear state-owned company Rosatom has ordered its first floating nuclear power plant, which has been under construction at Sevmarsh, but will be transferred to the Baltic Shipyard for completion. The construction work on the floating nuclear power plant started at Sevmarsh in April 2007. So far, a third of the plant's hull and middle section is built.

In total it is intended that eight such plants will be built. They have been designed by Central Design Bureau Iceberg, part of the UIC group that also owns the Baltic Shipyard. In July this year, the Baltic Shipyard finished tests of the two gas-steam generators intended for the first unit. The station will consist of two nuclear power installations of the icebreaking type, with each installation equipped with four gas-steam generators, also made by Baltic Shipyard, which currently has a contract for eight gas-steam generators, originally intended for Sevmarsh, to be delivered this year.

Currently, the technical project of a new type of icebreaker was initiated, with a power of 60MW, which is planned to be commissioned in 2014. One can assume that the yard is well placed to build this icebreaker, as well as other icebreakers planned. *NA*



Picture courtesy of Royal Caribbean International



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# The Royal Institution of Naval Architects

## Design, Construction & Operation of Super and Mega Yachts

April 2009, Genoa, Italy

### Second Notice



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

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



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

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



- All Aspects of Design - Hull, General Arrangement, Interior, Features etc.
- Operation
- Regulation & Classification
- Powering & Propulsion
- Sea Keeping
- Axillaries
- Features, Technologies & Finishes

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# Ambitious plans for Vyborg Shipyard

Expansion of existing facilities is set to be followed by the construction of a completely new shipyard.

While currently engaged in a complex build project to deliver two six-column semi-submersible drilling platforms for the Shtokman field to the Moss Maritime CS-50 design, it is clear that bolder ambitions are harboured for Vyborg Shipyard.

The RUB59 billion (US\$2.3 billion) contract was signed with Gazprom's Gazflot at the end of last year. Sevmach, in Severodvinsk, will equip the platform with a raiser cone. Samsung Heavy Industries won the US\$1.15 billion order for the topsides. The topsides are to be installed on the platforms at the Sevморput Shipyard in Murmansk.

Also called Shipyard No 35, the yard is part of the Severodvinsk-based Zvezdochka Ship Repair Centre. The first platform is to be commissioned in October 2010 and the second is due to become operational in March 2011. The keel

laying of the first unit took place in July. The units are designed to cope with up to 70cm thick ice, external temperatures of -30°C, and will be capable of drilling wells of 7500m at sea depths of up to 350m. The yard is expecting further such orders from Gazprom. Newbuilding tenders from Gazprom's 3-year vessel investment program are expected soon.

There is also an order is for another MOSS CS-50 platform, signed in March 2007 for a multi-purpose semi-submersible drilling rig, including some topside structures, for Sea Dragon Offshore, with final completion to take place at Scottish Haverton Hill. The Baltic Shipyard was subcontracted for the construction of six column blocks.

"Agreed delivery is in May 2009, but our intention is to deliver the rig as soon as January, to create space for Gazprom's order," said technical director Vladimir Voroshilov in June. The yard is also

negotiating over the construction of the topsides for this rig. According to Mr Voroshilov, the yard is also negotiating new supply vessel orders, for about five vessels for the Shtokman project, and is in discussions to build three to four additional semi-submersibles for oil exploration.

In July Gazflot announced it is to issue tenders for two drilling platforms in spring 2009, and 14 supply ships within this year. Severnaya Shipyard is apparently also interested in building these supply ships.

The yard is also building the accommodation modules for the Prirazlomnoye platform. The shipping of the two 1200tonne-1300tonne modules to Severodvinsk is planned for November this year. In 2006, it built the 2,860tonne power distribution module for the platform.

Recently, the yard built a series of 12,000dwt product tankers, designed by Vypel Design Bureau, for British-Kazakh oil transporting company Mobilex Energy Ltd, to transport Kazakh oil from Aktau to Baku. The yard has recently also been engaged in building supply ship hulls for many Norwegian owners, and tugs for the Port of Primorsk.

The yard has also been engaged in building cruise ship grand blocks for the former Aker Yards (now STX Europe) Turku shipyard in Finland.

## Investments at existing yard

Vyborg Shipyard today has a capacity to build ships up to about 140m-150m in length and 17.8m wide. The shallow seaway alongside allows for vessels to a maximum draught of 6.5m. The yard employs some 1700 people. Now, Vyborg intends to invest RUB400m in capacity expansion and modernisation by 2009. Production director Vladimir Ruskin told information service RosBusinessConsulting last year that the investments are to be used for introduction of a new metal cutting line, in order to raise annual cutting by 48%,

Vyborg Shipyard is currently investing RUB400 million in capacity expansion and modernisation of the yard. In addition a completely new shipyard is planned to be set up in nearby Primorsk.



# The Royal Institution of Naval Architects

## MARINE RENEWABLE ENERGY

19 - 20 November 2008, RINA HQ, London.

### Second Notice



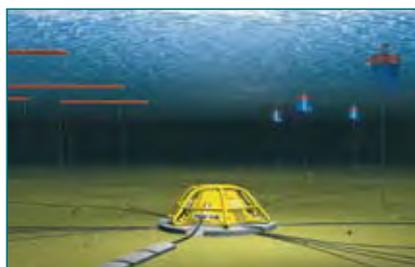
In November 2008 the Royal Institution of Naval Architects will be holding its first conference on Marine Renewable Energy. During these times of increasing environmental awareness and diminishing oil and gas reserves, many countries are now seeking to utilise their renewable marine resources; wind, wave and tidal will be significant energy sources of the future. At the spring European Council the EU agreed a target of 20% of all energy should be sort from renewable sources by 2020. Renewable energy is a key element of sustainable development, is vital in reducing greenhouse gas emissions and creates diversity of energy supply and security.



From initial research and development through to site planning, construction, installation and operation; the marine renewable energy industry covers a wide range of disciplines, expertise and industrial sectors. This conference will bring together the industry stakeholders to provide a forum for discussion and a means of professional development for those involved with marine renewable energy.

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to 20,000tonnes, and for the expansion of painting facilities to raise the volume of painting by 40%-50%. Mr. Voroshilov told *The Naval Architect* that the investment programme covered a three year period, with upgrading envisaging investments worth US\$10 million per year.

Meanwhile, the shareholders of the Vyborg Shipyard are currently planning to build a new shipyard in Primorsk to construct 150,000dwt tankers and 250,000m<sup>3</sup> gas carriers, and drilling platforms, including floating production storage and offloading vessels. The yard intends to secure its share of the large number of drilling rigs needed by Gazprom. The estimated cost for the new yard is RUB21.1 billion. The size of the building dock would be 400m x 85m and the gantry crane's lifting capacity 1200tonnes. The

newbuilding dock is designed to be divided, when needed, into two parts, to allow for concurrent construction of, for example, one ship or two offshore rigs. The FPSO production unit planned for the Shtokman field would fit into the new dock.

The covered drydock building will measure 550m x 130m. The CRIST Institute and, according to the institute, German company IMG are participating in the development of this shipyard.

Mr Voroshilov said; "We assume that we can begin constructing the new yard in January next year, and would have it ready in three years." He added that the decision to build a new yard had been given the green light at ministerial level, although the state's shareholding in the new yard was yet to be decided. "It is a big project. Infrastructure, including housing, etc. for 1500 people has

to be built."

Recently, Aker Yards also expressed interests in building a shipyard in Primorsk.

### Owner arrangements

In 2006 the conglomerate Akobarsk sold its 75% shareholding in Vyborg Shipyard to a group of ten major shareholders. Bank Rossiya apparently recently increased its shareholding in Vyborg Shipyard from 55% to 65%, and the owners of the shipyard consolidated a 25% of the shares, into Rosinvest Ltd., presumably in preparation to sell that part to USC.

In April, Sovcomflot signed a cooperation agreement with Vyborg Shipyard on building liquefied natural gas carriers at the new yard.

"We are, together with the Krylov Institute, doing much research work on LNG carriers," Mr. Voroshilov said. "Now we are in the process of evaluating the membrane and Moss tank systems." *NA*

## Sevmash struggles to match expectations

Sevmash, in Severodvinsk, near Archangelsk, has been struggling lately with a number of difficulties.

Last year, Sevmash lost the order for Gazprom's semi-submersible platforms for the Shtokman field to Vyborg Shipyard. In February this year, Norwegian shipowner Odfjell cancelled its contract, from 2004, for eight 45,000dwt product/chemical tankers, citing miscalculated building costs at the yard, it seems, partly due to the unexpected escalation of material and equipment prices, which resulted in delays with the production. Now comes news that Rosatom is transferring the construction of the floating nuclear powerstations, ordered from Sevmash but much delayed, to the Baltic Shipyard. In all, eight such plants were to be built.

Recently it was announced that the start-up of the Prirazlomnoye oil field has been brought forward once more. The production platform, under construction at Sevmash, has been delayed several times already, due to various reasons, including a lack of qualified workers.

It is to be launched from the Sevmash shipyard in 2010. A MOSS CS-50 semi-submersible for British company Sea Dragon is underway at the yard too, but is also delayed.

Sevmash primarily builds both nuclear powered and diesel-powered submarines for the Russian Navy as well as other navy vessels, also for export. Perhaps the main recent problem at Sevmash has been the delay of an aircraft carrier conversion for India. It was originally to be delivered in 2008. Today, the expected delivery year is 2012.

It is considered very difficult to build civilian vessels at Sevmash today, as naval ship production takes complete priority.

On the brighter side, in June, Sevmash was registered as a joint stock company JSC (OAO) Sevmashpredpriyatie, with an authorised capital of RUB7.256 billion. While a request for interest-free credit for 10 years, was refused, a July visit to the yard by Prime Minister Putin brought

an announcement that the government would be prepared to give guarantees worth RUB6 billion in credit through Vnesheconombank, and that Sevmash would receive other help in the form of several new naval orders. Current debt to the state would also be restructured.

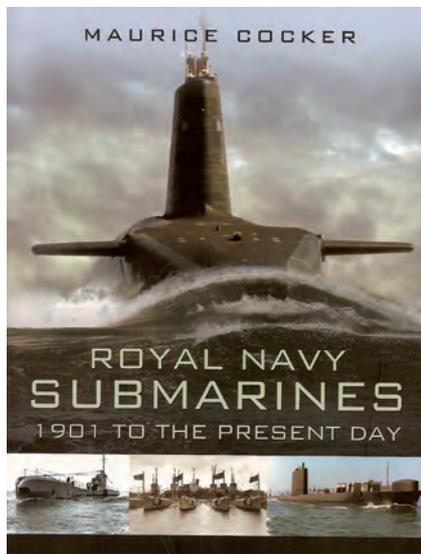
A year ago, at the Neva conference, CRIST presented Sevmash plans to set up a new and separate shipyard for commercial vessels. CRIST has participated in the design of the facility, which competes with other shipyard plans in the Baltic. The yard would have an annual steel output of 100,000tonnes and would, among other products, offer LNG carriers and nuclear powered icebreakers, which not considered suitable to be built in the major city of St. Petersburg. The productivity is intended to be doubled from current levels. The intention is (or was?) to produce three big vessels and two drilling rigs per year using big pre-outfitted grand blocks. *NA*

# Royal Navy Submarines 1901 to the present day

Review by E. C. Tupper

**Royal Navy Submarines 1901 to the present day**

By Maurice Cocker, published by Pen & Sword Maritime as a hardback, 2008, 136 pp. ISBN 978 1 84415 733 4, £19.99.



This book was first published in 1982 by Frederick Warne as *The Observer's Directory of Royal Navy Submarines*. The term "directory" is a good description of the type of book it is. This new edition has been updated to cover the last 25 years of submarine development including the Trident deterrent weapon system. It contains details of every submarine commissioned into the Royal Navy from the first Holland boat in 1901 up to latest Astute class. The author set out to fill what he perceived as a gap

in naval history and the book will be welcomed by submarine enthusiasts. It is well illustrated with photographs and, in many cases, line drawings of the boats described.

The book proper begins with a brief overview of the development and use of submarines, including the midget submarines, in the Royal Navy. It then describes in turn each class of submarine (54 in all including foreign boats captured or taken over) with a listing of the boats in each class, where built, when launched, a brief

specification, how lost or disposed of and brief comments on special design features. Separate appendices deal with RN submarines lost in peacetime; RN losses in the two World Wars; enemy submarines sunk by RN submarines in the two wars; U-boats taken over by the RN for evaluation after the Second World War; an account of the armaments fitted to RN boats and a list of submarine builders.

As a work of reference this book will be invaluable to those interested in the Silent Service. The reader can look up a specific boat or browse. In either case he or she will learn a lot of interesting facts about the submarines. For instance, the Oberon class had parts of the conning tower built from fibre glass, although in one, Orpheus, it was in aluminium. One of the class, the first Onyx, was sold to Canada after commissioning and renamed Ojibwa. The book does not list the other two boats of the class also built by Chatham Dockyard for Canada, but this is because they were never commissioned into the RN. The book does not attempt to deal with the detailed exploits of the boats which make fascinating reading in their own right but would require far too much space to cover. It is clearly presented and very well illustrated. **NA**

## LETTERS TO THE EDITOR

Sir,  
I find the material published in the "Naval Architect" recently, of great interest, particularly in the June 2008 issue.

It is clear to me the shipping industry is, at long last, making efforts to achieve better safety at sea, improve hull efficiency by aerodynamic and hydrodynamic changes that will result

in a more efficient hull thus reducing fuel consumption and therefore CO<sub>2</sub> emissions to the atmosphere.

At the same time, diesel engine builders are busy developing high, medium and slow diesel engines, now called "Green Diesel". This includes the use of "dimethyl ether" that will not emit SOx at all, and which is available in vast quantities worldwide.

In fact, it can be safely said, that a revolution is on the horizon, where commercial ships carrying 90% of the world's goods are now being designed to be safer, more fuel efficient and will greatly reduce pollution of the atmosphere and the seas.

Andrew G. Spyrou  
FRINA .

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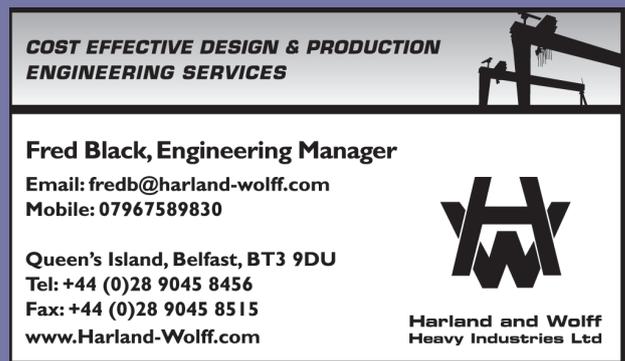


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# THE INTERNATIONAL CONFERENCE ON COMPUTER APPLICATIONS IN SHIPBUILDING (ICCAS 2009)



Organised by  
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and  
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1-3 September 2009, Shanghai, China

## First notice & Call for Papers

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

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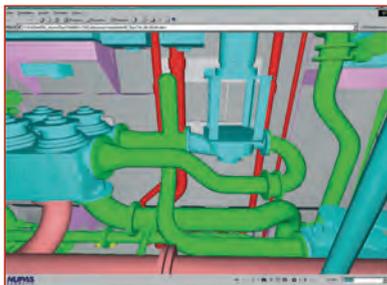
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The conference will attract a large international audience and provide a forum and means of professional development for all parties interested in computer applications in shipbuilding.

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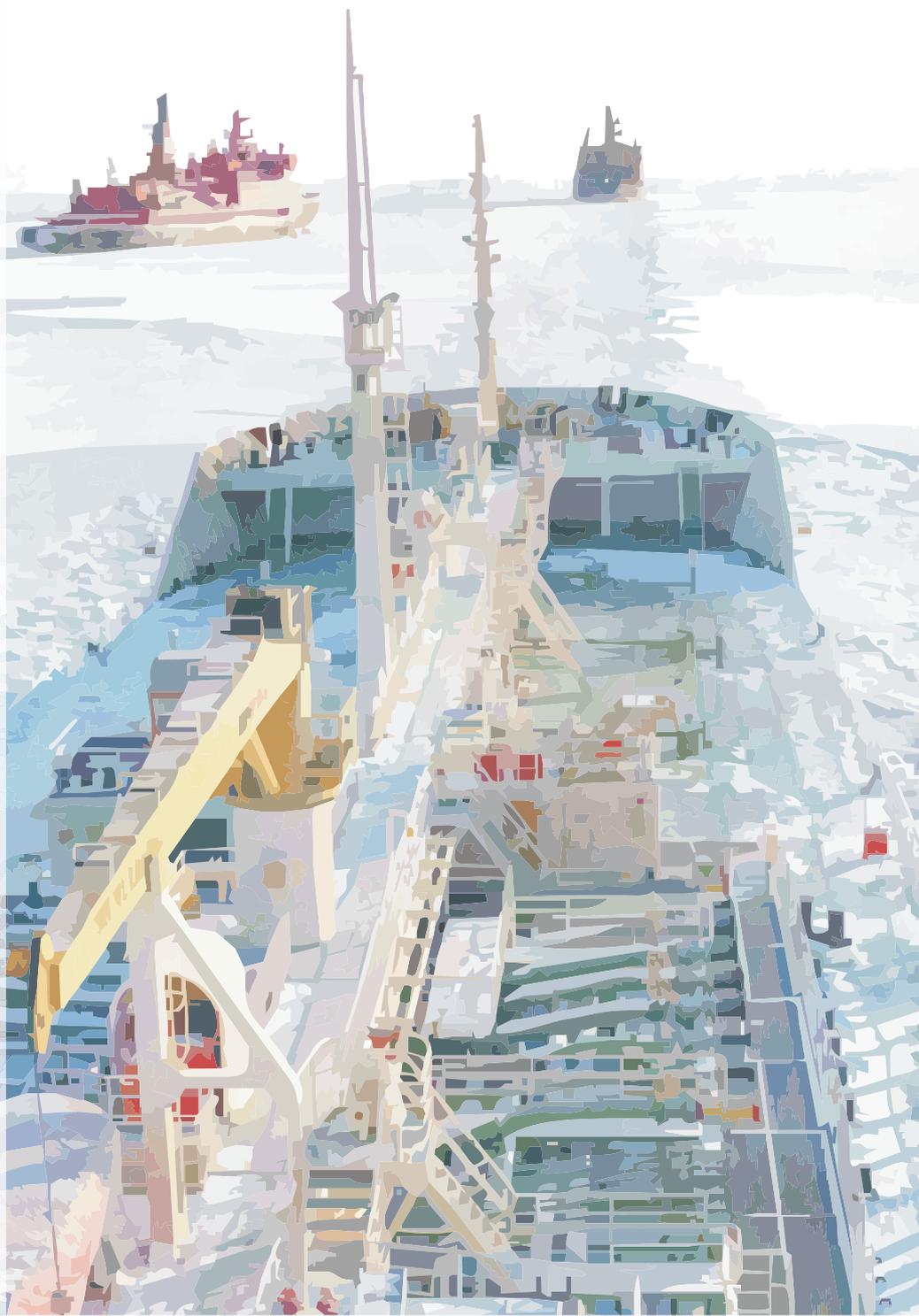
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