THE NAVAL ARCHITECT

A publication of The Royal Institution of Naval Architects | www.rina.org.uk/tna

South Korea / Lifesaving & ship safety /
CAD/CAM / Container ships / **October 2012**

AVEVA ENTERPRISE

AVEVA NET
Building Reputations

AVEVA NET is a powerful and secure information management resource that seamlessly links data from across the operational stages of Management & Design, Production & Planning, and Materials & Procurement.

Compliant with ISO 15926, AVEVA NET complements your existing infrastructure. It allows information mastered in virtually any application to be published and validated according to business standards and workflows. Information can then be shared across and beyond the organisation.

The leader in design, engineering and information management software for the process plant, power and marine industries, AVEVA invests in our customers' success through a global sales and support network in more than 40 countries.

AVEVA – building solid reputations for 45 years

AVEVA · THE FIRST 45 YEARS

www.aveva.com/avevanet

AVEVA CONTINUAL PROGRESSION

Editor Nick Savvides
Assistant Editor Samantha Fisk
Design/Production Manager Sandy Defraine
Group Sales Director John Payten
Assistant Advertisement Manager Daniel Payne
Advertisement Production Manager Stephen Bell
Subscriptions & Publications Manager Josie Pearlson
Publisher Mark J Staunton-Lambert

Published by:
The Royal Institution of Naval Architects
Editorial & Advertisement Office:
10 Upper Belgrave Street
London SW1X 8BQ, UK
Telephone: +44 (0) 20 7235 4622
Telefax: +44 (0) 20 7245 6959
E-mail editorial editorial@rina.org.uk
E-mail advertising advertising@rina.org.uk
E-mail production production@rina.org.uk
E-mail subscriptions subscriptions@rina.org.uk

Printed in Wales by Stephens & George Magazines.

A 2012 subscription to *The Naval Architect* costs:

	12 Months	24 Months	36 Months
Inland	£163	£282	£407
Europe	£170	£297	£424
Overseas	£182	£318	£457

Average Net Circulation 10,574
1 January to December 2011
ISSN 0306 0209

essential.

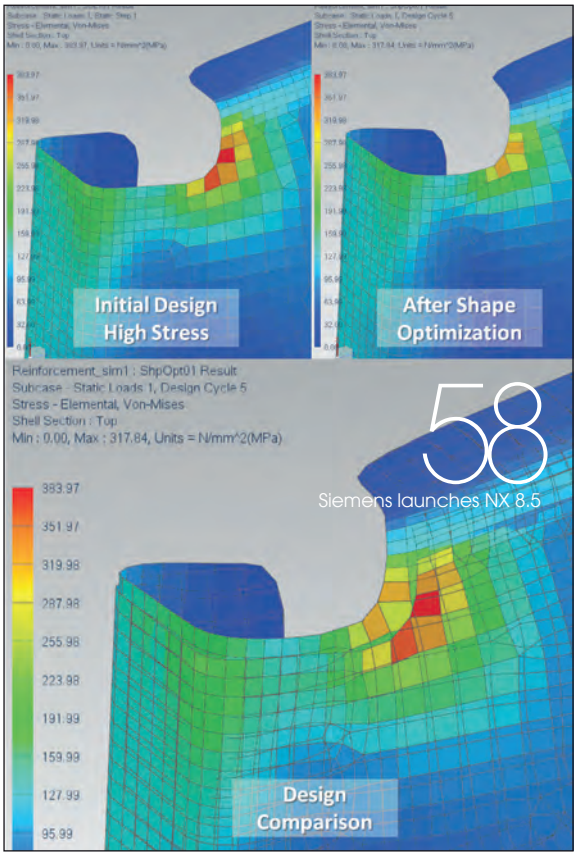
121 Years of Excellence

MarelliMotori®

1891-2012

www.marellimotori.com

30-65 Features



Digital Edition

The Naval Architect is published in print and digital editions. The current and archived digital editions (from January 2005) may be read on PC, iPad or other touchpad.

To read the digital editions, visit www.rina.org.uk/tna or download the free RINA Publications App.

METS 2012 – 25th ANNIVERSARY EVENT

Time to celebrate

METS, the biggest and best attended leisure marine trade show in the world, celebrates its 25th anniversary in 2012. The show has come through boom years and lean times but every year for a quarter of a century METS has continued to build international recognition as the undisputed number one trade show of its kind.

How METS works

METS and its associated SuperYacht Pavilion (SYP) is strictly trade-only, product focused and truly international with exhibitors and visitors coming from over 100 countries every year. There are renowned national pavilions, organised by 15 different marine industry associations from all over the globe.

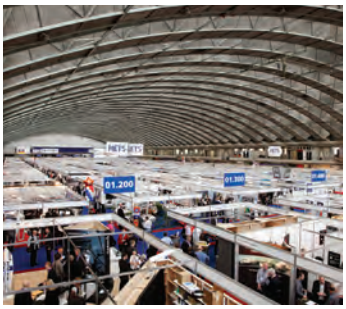
METS works

It is the best venue for serious face-to-face networking and has a unique family ambience. Industry professionals return to METS year on year to meet new faces but also to catch up with the many industry contacts they have built up over the years. If you only see someone once a year, you'll see them at METS!

Products and prizes

METS is an unrivalled gallery of proven and new products in all categories within the leisure marine sector. It's the place to spot emerging trends and innovations, and to see the extra special products that have won acclaim as finalists in the DAME (Design Award METS) prize, the undisputed leisure marine design award of the year.

Meet the world at METS 2012



25 years

Beware of the party spirit at METS 2012! A 25th birthday is a truly special landmark event. METS started back in 1988 with just over 100 exhibitors, and in 2011 had 1,331. In 1988 we had two national pavilions and modest exhibition space but by 2011 we had 15 established national pavilions and nine halls in the new RAI Europa Complex... there is a lot to celebrate!

- 19,000+ visitors from 100+ countries
- 1,300+ exhibitors (incl. 150+ in the SYP)
- 15 national pavilions
- 3 specialist pavilions including the SYP
- Strictly professional, strictly trade-only
- Meet & Greet areas for excellent networking

Where is METS?

METS is held in the Amsterdam RAI exhibition halls just 15 minutes from Amsterdam's International Airport and 10 minutes from the historic city centre. Professionals can attend for free if you pre-register and show organiser Amsterdam RAI can also book hotel rooms for you and assist with other travel requirements. Find all the details on metstrade.com

The Elicium, Amsterdam RAI.

MARINE EQUIPMENT TRADE SHOW
METS 2012
13-15 I NOV I AMSTERDAM I NL
Incorporating SUPERYACHT PAVILION
25th anniversary

Register NOW for your free entry via metstrade.com, please use this code: ME810001

metstrade.com

For more information: T +31 20 549 12 12 I F +31 20 549 18 89 I E mets@rai.nl

METS official magazine: IBI
Under the auspices of: ICOMIA
Member of: IBSO THE WORLD'S LEADING BOAT SHOWS
Organised by: AMSTERDAM RAI

Gone fishing

Too many fishermen, not enough fish. The shipbuilding industry is about to undergo a sea-change as forced restructuring takes place

A small delegation of South Koreans came to London recently to discuss the state of the shipbuilding industry with yours truly and some of his colleagues.

On their departure it was noted that the probable reason for the visit, aside from the obvious pleasantries, was as a fishing expedition, for information that is, on the likely development of the world's shipbuilding industry.

It is not that RINA has a handle on the global economy that the Koreans made this trip to ask our view, it is more a feature of the unpredictability of the market that has helped to stall any revival in the industry and a mark of the confusion and concern as to how the future may play out.

In this month's issue this conundrum is discussed at length. South Korean yards have been severely hit by the collapse in orders and their response has been for the larger yards to shift production into the offshore market. Smaller yards are looking to move into the building of more sophisticated ships.

Many yards in Korea and Japan have abandoned the bulk carrier market altogether, concluding that these ships are comparatively easy to build and the Chinese yards, which can offer significantly lower prices as a result of lower labour costs, should be left to build these ships.

One Korean yard, Sungdong which is in serious financial difficulties, complained that the Chinese yards were contracting bulk carriers at around 20% below cost price, forcing Koreans to pursue even greater improved productivity in an attempt to compete.

Analysis of the state of the shipbuilding industry in China reveals that the yards there are not in any better shape and some are considerably worse off when compared to their competitors in Japan and Korea.

It is not that China's yards are not growing, it is apparent that many have stopped trading altogether and many others are looking to consolidate. The larger state owned yards have managed to survive, it is the medium sized yards where the pressure is really acute, not just in China, but in every shipbuilding country.

Medium and small yards do not have the capability to adapt in the way that larger builders can, in Korea the major yards have switched production to offshore, in Japan Mistubishi Heavy Industries has stopped production of ships at its Kobe yard and is looking at producing machinery for nuclear power stations.

Options such as these are not open to the smaller yards, but there are national differences. In Japan, IHI and Universal have tied the knot in a deal which will see the two yards merge into a single company.

Japan's yards build primarily for the domestic market, however, and in South Korea and China the industry is geared towards exports. As the crisis has deepened and the scale of the over-ordering that the industry engaged in before the global economic crisis hit becomes clear, the medium and small yards in both China and Korea have looked for new orders to maintain their orderbooks, but they are fishing in an ever-diminishing pond.

Yard over-capacity is reaching a tipping point now with the Chinese yards and Koreans both looking to build gas carriers and offshore vessels in an effort to keep body and soul together.

Clearly there are not enough fish in this particular pond for all the yards currently fishing for orders, the sea is not only getting smaller, but there appears to be almost as many fishermen still trying to feed from it.

Something will have to give. In South Korea that something has been the collapse of a number of yards, 21st Century, Shina SB and Sungdong, to name three. Significant numbers of yards in China have also lost their battle for survival.

In the past whenever there has been a decline in ordering the yards have dropped prices and orders have flowed again. Today that is unlikely to happen as the banks are reluctant to lend to such a capricious industry as shipping. And with overcapacity remaining a problem finding cargo for new ships will be a challenge.

So even though yard prices are at rock bottom owners are not ordering. For the yards the one bright spot on the horizon is that as regulations change new designs have become necessary and as the industry (slowly) replaces older tonnage with more fuel efficient modern ships so a two-tier market may develop, which could in itself create demand.

That demand will necessarily have to be boosted by a turnaround in the global economic markets for the change to happen with any urgency. Some observers believe that the economic crisis will change by the end of 2013, other predict that 2014 will be even worse than 2013.

The truth is the future is more uncertain today than it's ever been. And no amount of fishing will provide the answers to this billion dollar question. *NA*

Lubrication

Oiling the cogs of trade

Almost as soon as the latest wide range BN lubes hit the market the oil companies have announced that they are developing a new range of lube oils that will meet future requirements.

Slow steaming, significant reductions in SOx, NOx and particulate emissions and the increase in the use of LNG as a fuel in dual fuel engines all pose a significant challenge to the lubrication companies.

"It is not possible to continue with the current chemistry with the future constraints," says Jean Philippe Roman, technical director at Total Lubmarine.

As a result Total is in the process of patenting a "new chemistry", says Roman, "it is a new technology with a new architecture and not a second Talusia Universal" he emphasised.

The patent will cover the formula and chemistry for an oil that lubricates without the use of calcium carbonate thereby reducing wear and tear said Roman, who would not elaborate further on the new lubricant. He says more information will be released after the field trials, which started in spring 2012, because "we must be certain that it works before we can reveal more," he says.

Shell has also said that it is looking at the next developments in wide range lube oils, though Loh Seng Yee, global marketing manager at Shell, would not elaborate further. The company announced the launch of Alexia S4 in July this year, but Shell says that its customers "want simplicity and not to have to worry".

Loh says that fuel specifications will change as will the fuel supply, which will change the available fuels and so the company has a "roadmap" so that it can see what is coming and plan for the changes, "we are doing the research" to meet these new challenges, says Loh. "We are already working on the next generation of lube oils," he added.

Classification

Better ships, cleaner air

Global shipping software provider NAPA has collaborated with the Japanese Classification society ClassNK to develop weather routing and optimal trim software.

The system offers an analytics service with "decisions support" in order to help owners improve the efficiency of their vessels. ClassNK says the system will undergo extensive testing on a ship that is currently owned by the Imabari shipyard.

ClassNK also announced that it has signed three European companies bringing a further eight ships onto its books, which have already swelled to more than 200 million GT.

In a departure for the class society, which mainly deals with Japanese owned vessels, ClassNK has signed contracts with BF Shipmanagement for three 700TEU container ships, Rederei Hamburger Lloyd for a 4,620TEU container vessel and Blumentahl, which has signed a deal for a 2,500TEU container ship and three Capesize bulk carriers.

Yasushi Nakamura, executive vice president at ClassNK, says: "The companies have signed with us because we can offer a 24/7 service with technological advantages at a competitive price."

Two of Blumenthal's Capesizes are under construction at the Shanghai Waigaoqiao Shipbuilding yard and the class society says it will be involved in the design appraisal and building wok from the outset.

"We had a strong weapon in connection with the harmonised rules," explains Nakamura, "only ClassNK has CSR software to date." He added that the class society will be able to offer design support to more than 20 projects simultaneously whether they are in China, Korea or Japan.

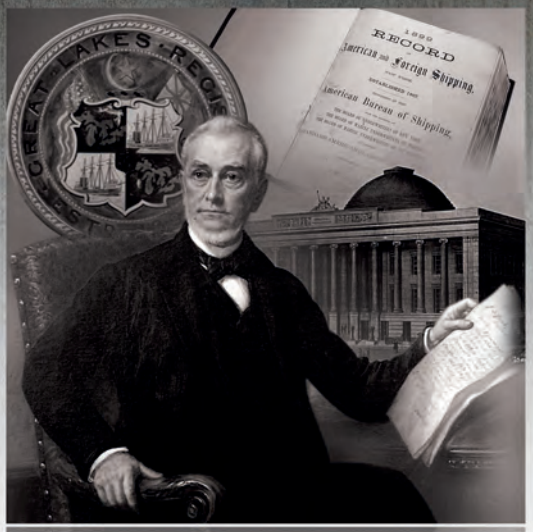
Investments

Graig and GMI work with Chinese

Cardiff-based Graig Group and Global Maritime Investments are extending their co-operation to provide Chinese shipyards with safe havens and tailor-made solutions for problematic deliveries. Working together, the two groups will provide yards with employment and management for vessels which have been built, but which cannot be delivered to the owner.

Hugh Williams, CEO, Graig Group, says: "There are many shipyards in China which are facing problems delivering ships or which are effectively building for their own account because owners cannot meet their commitments. They need good commercial and technical management for the ships to get them into operation and an exit route for the future. GMI has access to investors and employment opportunities and Graig knows the yards and ships and has the technical and crewing management expertise to get the ships into operation economically. Together we can help yards ride out this crisis of delays and cancelled deliveries."

Adding to this Steve Rodley, managing partner of GMI says: "In a prolonged poor market complicated by a deluge of new tonnage there are real opportunities for people with access to capital and employment. We have that, and with Graig we have the Chinese connections and technical competence to take up these opportunities. Ships which have been built but, which would otherwise end up as fire resales or stuck in the yard can be put into service by us and later sold on when the market improves. Our large physical portfolio and robust freight management systems provide a low-risk pool for tonnage, which is why we are the charterer of choice for risk-savvy



150 years
Tradition in safety

Setting the Standard for Service

Promoting the security of life, property and the natural environment.

www.eagle.org

FOUNDED 1862 ABS

counterparties. Extending this expertise into taking on distressed deliveries is straightforward and offers an optimal solution to current market challenges."

Software

GL launches GL EmissionManager

Shipowners and operators are being asked to measure, track and report the emissions from their vessels by both regulators and their business partners in order to operate more eco-friendly vessels. Classification society Germanischer Lloyd has launched its latest product, GL EmissionManager, which will allow owners and operators to collect, track and calculate the emissions of a ship in detail for the first time.

In cooperation with German shipping company Hamburg Süd, GL have developed the GL EmissionManager system to systematically capture all environmentally relevant ship operation data. The GL EmissionManager software is designed to systematise and structure reports that are recorded in less coordinated ways. Operational and voyage-related data, such as noon/position report, departure, arrival, and stoppage reports is recorded and analysed and environmental information, examining factors such as fuel consumption, emissions to air (CO_2, SOx, NOx), garbage, sludge, ballast water and chemicals, can be extracted.

The system consists of two parts, a software component that collects information ("emission recorder") and a 'Green Server', where the data is analysed and certified and where different reports are produced. The emission recorder is installed on the computer of the participating vessel, collecting data. The GL Green Server logs, structures and stores the data for comprehensive fleet analysis, for providing data for regulatory or classification purposes (e.g. SEEMP, EEOI or Environmental Passport), or for environmental shipping databases.

Celebrating the launch of the new GL EmissionManager system From left to right: Albrecht Grell, head of GL's Maritime Solutions Unit, Dr Torsten Büssow, head of Maritime Software at GL, Dr Pierre C. Sames, GL's head of Research and Rule Development, Dr Arndt Vespermann, member of Executive Board Hamburg Süd, Dr Christian Beiersdorf, GL Maritime Software.

Software

ABB launches new system

ABB has launched a complete marine advisory and automation system to improve fuel efficiency.

ABB has introduced several software applications for the marine market that will help all types of vessels reduce their fuel consumption. The application of the integrated advanced software, electrical systems and Azipod propulsion can help ship owners slash fuel consumption by up to 20%, says ABB. These Advisory Systems include the latest versions of ABB's energy management system for marine applications (EMMA) and Amarcon's Octopus solution.

ABB is able to provide a vertically integrated power and automation set of solutions that will assist shipowners to increase productivity and safety of the vessel operation, while minimising fuel consumption and environmental impacts. (see the Marine Power & Propulsion Supplement pp5)

Ancillary equipment

Wärtsilä Hamworthy to supply Exmar vessels

Wärtsilä Hamworthy has won a contract with Hyundai Mipo Dockyard to supply cargo handling equipment and engineering to four medium sized carriers for Antwerp-headquartered Exmar Shipping SA.

Each of the 38,000m^3 capacity vessels will be delivered from the first quarter of 2014 onwards. All vessels will be constructed to Hyundai Mipo's latest design, which has an increased capacity of 3,000m^3 to strengthen competitiveness in the international marketplace, says the company.

The design includes an improved hull shape to minimise resistance in water and optimise fuel consumption. The engine room and deck will be designed so that it can use LNG or LPG as fuel to reduce CO_2, SOx and NOx air emissions.

Wärtsilä Hamworthy will supply cargo related engineering including deck tank engineering, reliquefaction plants, Wärtsilä Moss inert gas generators, Wärtsilä Svanehøj cargo pumps, cargo heater and vaporiser, cargo control systems, supervision and commissioning. All equipment and engineering services will be delivered in 2013.

PUBLICIS

PURE-BRED PERFORMANCE. FROM A LONG LINE OF WINNERS.

www.man-engines.com

MAN Truck & Bus – A member of the MAN Group

MAN has an impressive line-up of powerful diesel and gas engines finely tuned to the needs of just about every industry. You will find MAN engines pulsing at the heart of agricultural and environmental equipment, construction machinery, rail vehicles, power generators, yachts and commercial ships – to mention but a few. Built on a long and solid lineage of German engineering, MAN engines embody the vast experience and insights gained from MAN's industrial bus and truck lines. So put your business on the winning track, with the unbridled horsepower, economy and endurance of a pure-bred. Visit **www.man-engines** for more information.

MAN Engines
A Division of MAN Truck & Bus

MAN

Inland LNG is an option

A number of companies are considering the use of LNG for inland waterway transportation, including the oil majors who are looking to LNG as a means of reducing emissions without having to use expensive low sulphur products.

Although MOL is not going down this route with its own newbuilding projects in the LNG sector, Ed Carr, managing director of MOL LNG Transport (Europe), says that the company has been approached by several parties to see if it would be willing to use older vessels as storage units. "The idea is that these would feed into bunkering barges or ships, which in turn would feed small satellite terminals," he says. There is no doubt, he adds, that the industry sees LNG as a solution to the emissions problem.

Engine manufacturers like Wärtsilä and MAN Diesel & Turbo are stepping up their efforts to supply a range of dual-fuel gas engines for the shipping industry. MAN Diesel & Turbo's product range for slow steaming vessels includes the G-type two-stroke engine range, which the company says "provides first-class support with its extra-long strokes for slow steaming". Under its service brand MAN PrimeServ, MAN Diesel & Turbo is also offering retrofit solutions for converting two-stroke engines to slow steaming.

A new slow speed engine, under development at Wärtsilä, features low pressure fuel injection, which the company believes will facilitate compliance with the demands of the North American emission control area.

MOL has four newbuildings under construction in China, all of which already have long term charters with ExxonMobil – two of them for the Papua New Guinea PNG LNG project and two for the Australian Gorgon project. Steel cutting has just begun for the new ships, with the first scheduled for delivery in January 2015 a further two for delivery that year and the fourth in 2016. MOL's policy is only to order LNG vessels against long term contracts, Carr says.

While building LNG ships is a relatively new concept for China, Carr says yards are making maximum efforts, not least because the vessels are for export and not for domestic use. "They are even more focused on doing a good job because they really want to develop this business, just like Japan and Korea did. Everything I hear from our site team is that the shipyard is making a really big effort, especially on the quality side".

While one of the big markets for the future of LNG is China, building an export market for LNG ships makes sense.

Optimising the use of vessels is a key issue today. Carr says that when he started in the LNG business more than 30 years ago it was a "point to point trade and vessels never got mixed up with other business. They were dedicated to that particular trade and it was very, very conservative".

In the last 12-13 years operators are realising that they can optimise their fleet by chartering out vessels, something that was never done in the past. "Both buyers and sellers now understand there is value in shipping. It is not just cost. What you see now is a lot more discussion in gas contracts as to who is going to do the shipping, with each side sometimes wanting to do it".

The race is on for LNG development, but will smaller ships lead the way

MOL's newbuildings are project specific and were ordered against contracted volumes, Carr says. The new ships are 172,000m^3 which Carr describes as the "upper band where you are seeing a lot of the recent orders". Vessels over the 165,000-175,000m^3 range could result in issues like terminal compatibility and space in storage tanks ashore becoming concerns.

Going smaller is also an option. MOL has two ships that it co-owns with Sonatrach, which are 75,000m^3 and deployed in the Mediterranean, serving the smaller terminals. They are specifically built for the trade. "If the trade needs it, someone will do it, but we are also seeing people beginning to talk about building small LNG receiving facilities for small power generation needs", he says. "Those people don't have the demand at this stage to take a big ship. There is some interest in having smaller ships to feed those particular trades".

One issue that Carr raises is new developments in containment systems to reduce boil off with GTT and Samsung designs where boil off is almost 30% down on current figures. MOL has ordered a ship in Japan where the boil off is almost 50% down, he says.

One problem Carr highlights is the switch over to diesel engines. While these may be more thermally efficient, with shifting trading patterns there are now vessels that have been designed to go 19-20knots going at 16-17knots. "If you have conventional boil off of 0.15% per day you can find yourself in a position where you have too much fuel. Now you have ships that are going in lots of different areas and depending on the date the cargo is needed they maynot need to go at full speed.

"As engines are more efficient, you have a situation where the fuel is being wasted and you have more boil off than you need to go at the speed you have to go at". The solution, he says, is to reduce the boil off and if more gas is needed then a forcing vaporiser can be used.

According to RS Platou partner Keith Bainbridge, the distance for shipping LNG has widened and, taking into account boil off, could mean a loss of 6-7% of the cargo en route.

Shipyard capacity for building LNG ships is not an issue according to Bainbridge. Korea's main yards of HHI, SHI and DSME can each build about 12-13 vessels per year, STX can build up to five vessels per year, with Japanese output of about nine vessels, in addition to Chinese production. In giving an indication of the rate of progress, he told a recent meeting of the London Shipping Law Centre that while Korea in 2001 had never built a LNG vessel for export, by 2006 they had built 17 ships. The three big yards in Korea have 85-86% of the market.

In considering how floating LNG will affect LNG ship design, Bainbridge said that for jetty based projects there would be no impact and vessels will load in the conventional manner. However, for offshore installations there were a number of considerations including sloshing – using moss tanks or strengthened membrane tanks might be required – bow loading, with its associated risk, the need for dynamic positioning when manoeuvring ships in open water. So far, he said, yards have been reluctant to quote on bow loading and dynamic positioning as this required project specific information. The question remained as to how much owners were willing to pay for flexibility.

A large number of the LNG newbuildings on order are for new entrants to the market or speculators, Bainbridge said. He believed that from 2014 onwards there will be more LNG ships than there is product and therefore prices will come down. Prices could also be affected by the number of new ships coming in without contracts.

As the demands of new environment regulations begin to bite, owners and operators are increasingly looking to LNG as the fuel of the future.

The number of LNG newbuildings on order is testament to the interest being taken in this sector. Sinopec and China Shipping Group have recently signed an order for four LNG ships, with options for a further two. The 174,000m^3, dual-fuel diesel-electric (DFDE) vessels will be built at Hudong-Zhonghua Shipbuilding with delivery starting in 2015.

Tanker owners like Tsakos have also indicated that they are interested in expanding their activities in the segment ,including a sizable proportion of new players.

If much has been made about the development of LNG in the future, crew training by new entrants into LNG business – many of the newbuildings are for companies that do not have experience in the market – will be vital if quality standards onboard LNG ships are to be maintained. As the sector expands rapidly, where are the specialist personnel to come from? MOL, for example, sources its officers from Europe and India, with Filipino ratings.

According to Carr, pressure needs to be maintained on new players in the LNG market to conform with industry standards on safety in an industry that has a very good track record. As long as the industry does not accept substandard operations, standards will remain high.

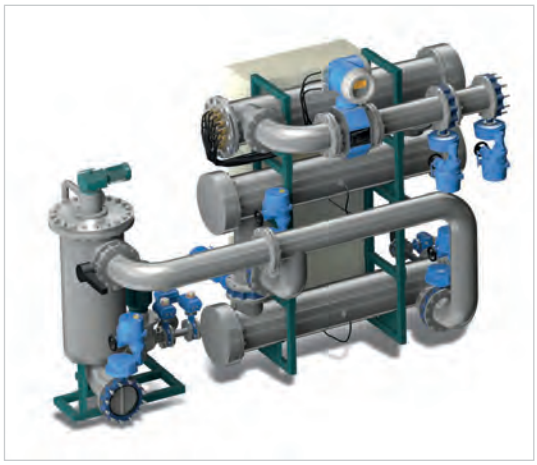
Shortage of skilled personnel in the LNG sector is also obviously a problem at sea and on land, and the situation in Australia, which is set to become a major exporter of LNG for the future, was outlined in a recent report by consultancy Harrier which urged a longer term approach to hiring skilled personnel.

The issue was on the agenda at a resource industry forum held in Queensland recently, when Australian Mining and Metals Association executive director Minna Knight warned of skill shortages in the state. Other problems she raised included workplace relations, new developments in health and safety and fly-in/fly-out practices aimed at reducing pressure due to skill shortages. *NA*

Ballast water treatment systems

GEA joins the BWT market

GEA Westfalia Separator Group has launched its BallastMaster ultraV solution. The system enables necessary cleaning processes to be carried out without any introduction of chemicals and is based solely on mechanical filtration and irradiation with UVC light. As the lamps self-clean by means of ultrasonics and the filter is cleaned by suction, the entire system works without using chemicals.



The BallastMaster ultraV from GEA

GEA says that, no environmentally damaging disinfecting by-products are produced that would require subsequent disposal.

The system can be flexibly adapted to meet different size requirements, it is also suitable for use in every shipping class. The modular structure of the BallastMaster ultraV it is not only suitable for fitting into new ships, but also for retrofitting. The BallastMaster ultraV has been type-approved in accordance with IMO resolution MEPC. 174(58).

www.gea.com

Lifesaving

LSA supplies Boreal Transport Nord

Liferaft Systems Australia (LSA) has announced a contract to supply and install its Marine Evacuation Systems (MES) and large capacity liferafts on four double ended car ferries for Norwegian ferry operator Boreal Transport Nord AS.

The four ferries will be built by Fiskerstrand BLRT AS in Norway and are allocated new build nos. 11,12, 13 & 14. The vessels will be delivered by the end of 2013. Each of the new vessels can accommodate up to 249 passengers. Two of the ferries have closed in car decks for operation in C-class waters areas. These two vessels will be fitted with LSA 14m MES and 100 person capacity self-righting liferafts. The other two vessels are of open type, for operation in water areas classified as D. These vessels will be fitted with LSA 14m MES and 128 open reversible liferafts.

www.lsames.com

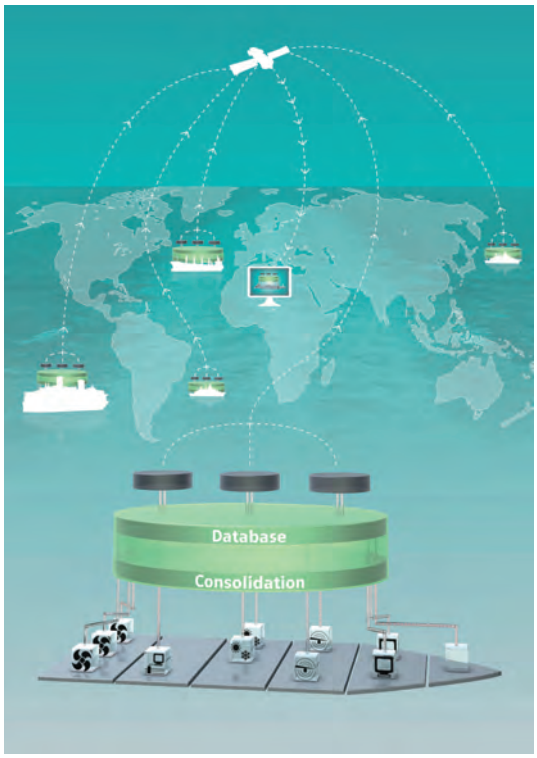
Siemens goes EcoMain

Siemens has introduced EcoMain, the integrated system solution for performance optimised ship management. It brings transparency to ship operations while facilitating sustainable management, says the company.

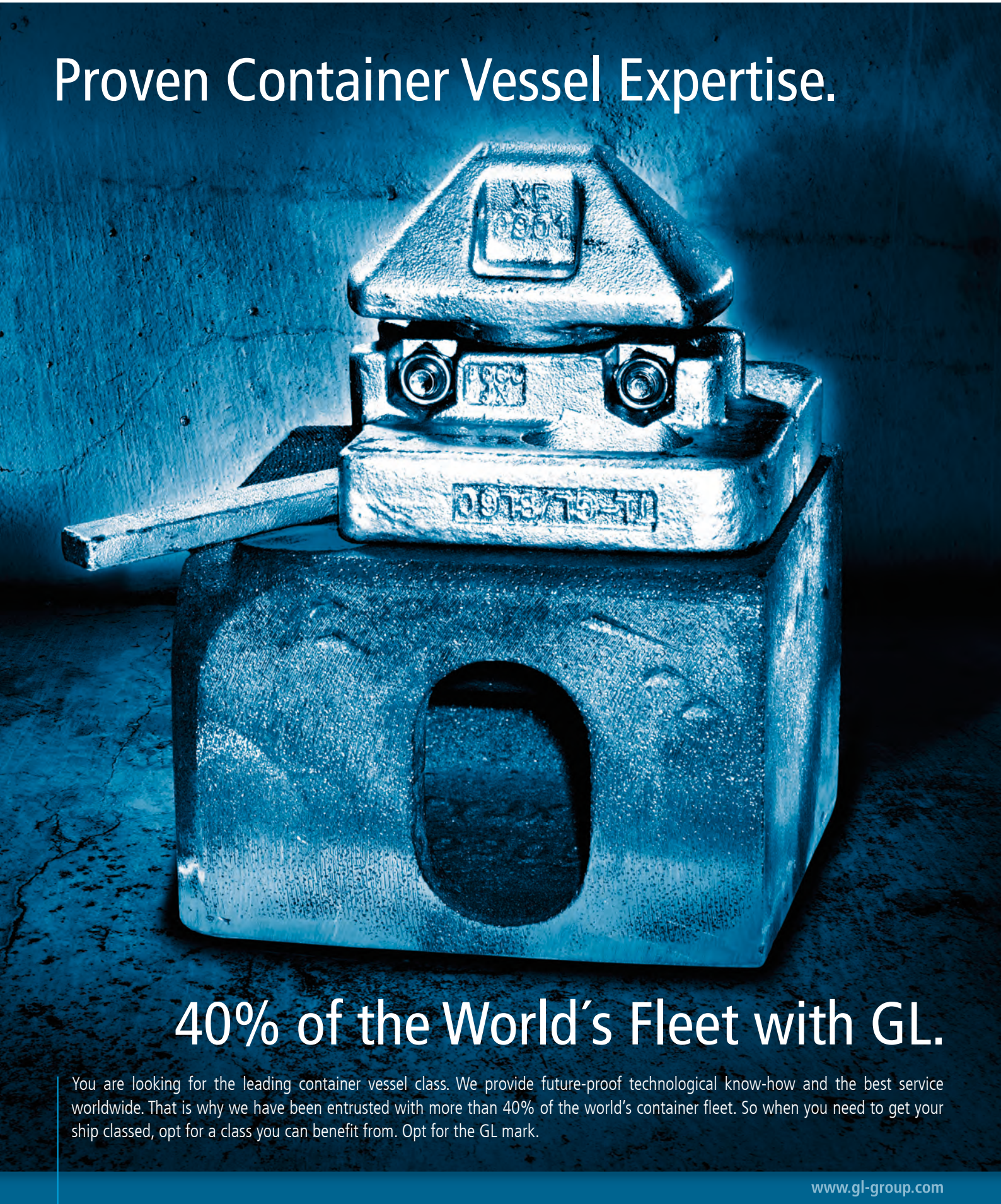
EcoMain captures and processes all ship operating data for prompt and simple transparency for the crew and the shipowner. This includes temperatures, rotational speeds, draft and speed as well as outside influences like weather data and water depth amongst others. Taking all relevant data into account, the integrated concept EcoMain gives maximum transparency of the entire ship operation. EcoMain also offers the captain suggestions by analysing the interactions between the data in order to optimise trimming or navigation. Through this process maximum efficiency for the operation of the ship can be attainted. These suggestions can show optimised fuel consumption in the form of reduced costs and emissions at the same time.

www.siemens.com

EcoMain is aimed at making ships operations more efficient



Germanischer Lloyd



Proven Container Vessel Expertise.

40% of the World´s Fleet with GL.

You are looking for the leading container vessel class. We provide future-proof technological know-how and the best service worldwide. That is why we have been entrusted with more than 40% of the world's container fleet. So when you need to get your ship classed, opt for a class you can benefit from. Opt for the GL mark.

www.gl-group.com

Ancillary equipment

Elcome unveils latest switchboard

Elcome International has announced the introduction of the new ELSYS family of marine electrical switchboard and power management systems.

The ELSYS systems use design technologies with new-generation switch-gear components to reduce the size and weight of the switchboards. The modular design allows flexibility to satisfy performance requirements and meet space limitations.

www.elcome.com

Elcome announces extension of its switchboard range

Ballast water treatment system

Cathelco launches BWTS

Cathelco has launched its ballast water treatment system on to the market. The Cathelco BWT system is based on a combination of filtration and UV technology. The units are scalable for all sizes of ships and will be available with capacities from 50m^3/hr to 2,400m^3/hr.

One of the key design features is the way in which the sea water passes through the UV chambers. Through computer analysis, Cathelco engineers have produced pipework which sends the water on the unique trajectory which creates a 'helix' in the flow. This means that the maximum surface area of the water is exposed to the UV lamps, increasing the efficiency of the process and ensuring that all organisms and bacteria are rendered harmless, says the company.

UVT sensors positioned in front of the reactor chamber, constantly measure the UV transmittance of the water and send a signal to the control panel which automatically adjusts the power to the lamps. Another important feature is the unique 'ball' cleaning system which ensures that the surfaces of the quartz sleeves surrounding the UV lamps are kept clean. When the cleaning cycle is initiated the UV chambers are isolated from the rest of the BWT system. A separate pump is activated enabling specialised foam balls to be introduced into the chambers from a reservoir. These gently polish away any residue that may have collected on the glass as well as cleaning the inside of the UV chamber, reducing the risk of corrosion, says Cathelco. This approach eliminates the use of chemicals and overcomes the potential for damage when using mechanical cleaning methods.

The system is currently completing land-based tests at the NIOZ research facility in Holland and, at the same time, shipboard tests are taking place on *Eddystone*, a ro-ro vessel owned by Foreland Shipping and managed by Andrew Weir.

www.cathelco.com

Cathelco launches its BWTS that uses UV and 'ball cleaning' technology

Ballast water treatment systems

Coldharbour launches in-voyage BWTS

Coldharbour Marine is set to bring a change to the ballast water treatment (BWT) market with its Sea Guardian technology. The patented third generation Inert Gas Generator system (3gIGG) can be used onboard any vessel, but aimed at the gas carrier and bulk carrier market.

The Coldharbour Marine GLD ballast water treatment system uses the gas output for its Sea Guardian inert gas generator that is linked to specially designed gas lift diffusion pipe assembles inside the ships ballast tank.

During the voyage, the output from the IGG is pumped to the GLD in the ballast tanks where the treatment takes place. The system is capable of handling water with high levels of suspended solids. There are no mechanical filters to block or back flush, no complex electrical systems and no space consuming equipment, says Coldharbour Marine. The ballast water is also treated whilst the vessel is underway and does no disrupt the vessel's operating schedule.

The Coldharbour Marine GLD ballast water treatment system is a G8 type system as defined by the IMO. The system is under the flag state approval of the UK Maritime and coastguard Agency (MCA) and Lloyd's Register. The system has completed land based testing and is undergoing testing on a VLCC, under both IMO and USCG testing perameters.

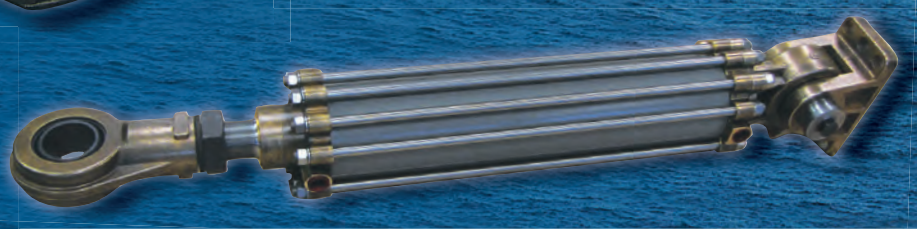
www.coldharbourmarine.com

Complete Packages for ALL Vessels

Whatever your vessel size or type may be, Kobelt can provide a complete package of engine controls and steering gear to meet your needs. Custom systems are also available.

Kobelt has been manufacturing reliable, versatile engine controls, steering products, disc brakes and accessories for close to 50 years.

www.kobelt.com



Why not join the ranks of our satisfied customer base world-wide? Trust Kobelt to deliver!

KOBELT

604.590.7313 sales@kobelt.com
Surrey, British Columbia, Canada

Offshore boost for naval architects

Mark Charman, group CEO of global recruiter Faststream, examines the key employment market trends for naval architects

Faststream has been finding and placing naval architects on behalf of companies in the maritime, energy and defence sectors for 12 years, but the past 12 months have seen an unprecedented demand for naval architects from the oil and gas industry to work on the growing number of floating production and storage vessels (FPSO) under construction and in operation worldwide.

When Shell unveiled its revolutionary Prelude FLNG project in May last year, it marked an important milestone in the development of the offshore LNG industry, which to that point had lagged behind its oil counterparts. Mitigating the need to lay pipelines and build processing plants on land, FLNG will unlock offshore energy resources and radically change the way the industry produces natural gas.

Mark Charman, group CEO, Faststream see's a shift in the market for naval architects

Crucial to the development of this industry will of course be naval architects with an LNG background. Employers are, however, fishing for talent in a very small pool. Whilst we have over 8,000 of these candidates on our database, finding experienced naval architects with experience of LNG, structural design and floating offshore production is far from easy.

Coupled with the LNG developments is the surge in FPSO and drilling projects from the oil sector. Whether based in yards in the Far East or managing newbuild or conversion projects for owners and operators, there is currently plenty of challenging project work available. It is the naval architect with between five and 12 years of experience, capable of taking a project from specification to completion, that is in particularly short supply. Many of these people are being sourced from the classification societies which, simply cannot match the salaries on offer from the oil majors and owners, who typically offer remuneration that is 30% higher. With their prestigious projects and the chance to be involved at the cutting edge of design and operations, the pull of the oil and gas majors is all too obvious. Class societies are working hard to ensure that their brightest and best have the autonomy, variety and responsibility in their day to day work to keep them from being tempted away.

Offshore consultancies have been constantly on the look-out for naval architects and will typically take on a couple of graduates every year as well as more experienced people. Consultancies, of course, offer a huge variety of challenging work where the answers are not always in the book, but involve forensic investigations and making judgments based on experience. People with an enquiring mind and a mix of commercial and common sense are always being sought after.

For those willing to undertake contract work in the UAE or Singapore yards, the financial rewards can be even higher with six-figure salaries the norm for practical, project based naval architects with 10 or more years of experience under their belts.

But, it is not just the oil and gas sector which is looking for experienced naval architects. The hiring requirements of both the marine and defence sectors has been steady over the past 12 months, following a period of hiring freezes by many HR departments in the wake of the global economic shocks of 2008/2009. The focus on developing a more sustainable maritime industry to meet environmental and fuel cost expectations means that R&D super-specialists in areas such as hydrodynamics and propulsion are in demand to create the new technologies and breakthroughs for the ships of the future. Also, following a year or two's absence, Asian yards are back in the employment market and looking for naval architects to work on their newbuilds.

The defence sector has always been a steady employer of naval architects and the British government's development of the next generation of nuclear submarines is going to mean more vacancies in the UK. However, candidates find moving in and out of the defence sector to be difficult, both from a security clearance and professional point of view. Attracting large numbers of senior naval architects from outside the sector is proving to be near impossible, so defence contractors have been relying on hiring more graduates.

Outside of defence, however, the prospects for many recent graduates are not so bright. Employers are looking for graduates who

TO BRING YOU
SAFETY ON BOARD

WE DEVELOPED **SHIPLINK®**,
RELIABLE AND HIGH PERFORMANCE
CABLE SOLUTIONS

Nexans

At the core of performance

For your integrated on board environment, SHIPLINK® provides a complete range of energy and telecom cables, which conform to the highest international standards. Our easy to install SHIPLINK® solutions are designed and customized to meet your complex requirements and we constantly innovate to improve safety and reliability. You can rely on Nexans to get services that only a world-class manufacturer can provide.
www.nexans.com/shiplink - marcom.info@nexans.com

have shown a particular interest in their area of work, from the choice of modules taken to internships attended. In the UK, Newcastle, Southampton and Strathclyde remain the employers' universities of choice and students need to demonstrate a real focus to their degree.

Looking forward, we can see that there will be a steady demand for naval architects in all the major industries in both the short and medium term.

The salaries on offer for naval architects have remained broadly static over the past two years which is surprising. According to a Faststream survey answered by over 4,000 maritime industry professionals from a range of disciplines (July 2012), over half of shore based maritime employees reported a 5% or more salary rise in the last year, with the commercial sector receiving the largest raises. For graduates the salaries have remained static for up to five years. *NA*

UK based graduate salaries

- **£21,000 – £22,000 (US$34,000-35,600)for SME companies**
- **£26,000 - £30,000 (US$42,000-48,500) for larger organisations such oil majors and class societies**

Basic salary for naval architects with five years experience

- **Leisure market (yachts, recreational craft) & shipyards - £35,000 (US$56,800)**
- **Offshore consultancy - £42,000 (US$68,000)**
- **Marine consultancy - £38,000 (US$61,500)**
- **Oil major - £48,000 (US$77,900)**
- **Class society - £35,000 (US$56,800)**
- **Oil & gas EPC contractor - £48,000 (US$77,900)**

Basic salary for naval architects with 10 years + experience

- **Leisure market (yachts, recreational craft) & shipyards - £50,000 (US$81,100)**
- **Offshore consultancy - £71,000 (US$115,200)**
- **Marine consultancy - £50,000 (US$81,100)**
- **Oil major - £88,000 (US$142,800)**
- **Class society - £45,000 (US$73,000)**
- **Oil & gas EPC contractor - £81,000 (US$131,500)**

RINA - Lloyd's Register
Maritime Safety Award

The Institution believes that the safety of both the seafarer and the maritime environment begins with good design, followed by sound construction and efficient operation. Whilst naval architects and other engineers' involved in the design, construction and operation of maritime vessels and structures do not have a patent on such issues, nonetheless their work can make a significant contribution.

The Institution also believes that it has a role to play in recognising achievement of engineers' in improving safety at sea and the protection of the maritime environment. Such recognition serves to raise awareness and promote further improvements.

The Maritime Safety Award is presented by the Institution, in association with Lloyd's Register, to an individual, company or organisation which has made a significant technological contribution to improving maritime safety or the protection of the maritime environment. Such contribution can have been made either by a specific activity or over a period of time. Nominations may be made by any member of the global maritime community, and are judged by a panel of members of the Institution and Lloyd's Register. The Award will be announced at the Institution's Annual Dinner.

Nominations are now invited for the 2012 Maritime Safety Award. Individuals may not nominate themselves, although employees may nominate their company or organisation.

Nominations may be up to 750 words and should describe the technological contribution which the individual, company or organisation has made in the field of design, construction and operation of maritime vessels and structures,

Nominations may be forwarded online at *www.rina.org.uk/MaritimeSafetyAward*

or by email to *MaritimeSafetyAward@rina.org.uk*

Nominations should arrive at RINA Headquarters by 31 Dec 2012

Queries about the Award should be forwarded to the Chief Executive at *hq@rina.org.uk*

IF WE want to explore the seabed, can we do it from home?

Online ocean observatories – a dream our software could bring to life.

Another world exists beneath the oceans, the Earth's last great unexplored frontier. As many as 90 percent of the planet's marine species are undocumented, and, although new discoveries are made every day, many believe only global social collaboration will enable mankind to unlock the true secrets of the deep.

The **3D**EXPERIENCE platform from Dassault Systèmes is used by marine innovators everywhere not just to turn new concepts into reality, but to enable ideas and information to be shared like never before. Through **3D**EXPERIENCE, for instance, marine scientists and the public everywhere can share data and video from NEPTUNE Canada – a huge network of Pacific seabed laboratories – live and online, 24 hours a day. Now every room can have the ultimate sea view.

Our software applications for the 3DEXPERIENCE **platform:**
CATIA / SOLIDWORKS / SIMULIA / DELMIA / ENOVIA
GEOVIA / EXALEAD / NETVIBES / 3DSWYM / 3DVIA

It takes a special kind of compass to explore the world's future possibilities. Innovative companies use our **3D**EXPERIENCE software platform to understand the present and navigate the future.

Find out more: **3DS.COM/MARINE**

Our customer: NEPTUNE Canada Transforming Ocean Science

DASSAULT SYSTEMES | **IF WE** ask the right questions we can change the world.

Naval architects uncovered?

Robert Sniffen, a senior account executive with International Transport Intermediaries Club (ITIC), explains how naval architects can protect their business from claims

The specialist responsibility of naval architects is to ensure that a safe, economic and seaworthy vessel design is produced for their clients. As such, they face exposure to high levels of liability and need a good professional indemnity insurer who understands what they do.

But, even before you reach for your insurance policy, the first steps you can take to protect your company from claims involve making sure that you contract correctly. Because of the increasingly litigious world in which we operate, deals and designs done on the back of an envelope, or equivalent, should be long gone.

Naval architects should ensure that they operate on standard terms and conditions, which clearly set out the scope of work – what they will, and will not, be responsible for. The contract should also limit liability to a specific amount relative to the fee being earned for the project. Choice of jurisdiction and governing law may also help reduce or limit potential exposure. Finally, an exclusion or limitation clause should be included to account for any alterations made after the initial design.

We are all human, and mistakes will happen. When you are faced with a mistake, you need an insurance company alongside you to strike the balance between keeping your client as happy as possible and assisting you in your claim. Consider the following examples of claims made by companies insured by ITIC.

A naval architect was contracted to design a yacht for a race. When built, the yacht sailed over 10,000 miles without difficulties. However, when it was lifted from the water, several cracks were noticed along the keel. Both the manufacturers and the naval architect were notified that cracks had appeared. The naval architect subsequently realised that an error had occurred when transposing the design specifications onto the blueprint drawings, which were then passed on to the manufacturers. This error in design meant that the keel did not meet the strict strength specifications required of a racing yacht.

We are all human and mistakes can happen, that's when you need an insurance company says ITIC executive Robert Sniffen

The naval architect informed the company of its error. However, a subsequent survey completed by a third-party surveyor found the cracks to be caused by incorrect manufacturing techniques. The manufacturers offered to repair the keel but, if they had done so, it would still have been unsuitable for racing due to the design error. ITIC agreed that a keel of the correct specification should be supplied and settled additional costs.

In another case, a firm of naval architects was instructed to design a vessel to be used for a new ferry service. When completed, the owners alleged that the vessel suffered from structural inadequacies, which included continued cracking of the hull. They said the vessel could not perform in certain weather conditions as they had requested it to do, even following repeated repairs. At one point the Maritime and Coastguard Agency had to reduce the amount of passengers the vessel could safely carry.

Eventually, the ferry service was completely suspended and the owners commenced legal action against the naval architects in the sum of US$600,000. This covered the cost of repairs, loss of use, loss of profits and diminution of value of the vessel. Expert evidence was obtained on behalf of the naval architect, but it was not particularly helpful to the defence.

It became apparent that the owners were suffering from financial difficulties, in part due to the fact that the ferry service could not run. On this basis, ITIC instructed lawyers to make an application for security for costs (to cover the defence costs incurred in the event that the owners became bankrupt) in the sum of £75,000 (US$121,500). Legal costs and expert witness fees had already exceeded £40,000 (US$65,000) and were estimated to exceed £100,000 (US$162,000) if the matter progressed to a full trial.

The application was granted in ITIC's favour, but unfortunately only to the sum of £25,000 (US$40,000), as the judge had some sympathy with the claimant's argument that it was in dire financial straits due to the mistake of the naval architect. Despite pleading poverty, the owners did manage to obtain the funds and pay them into court.

The naval architect was left in an awkward situation whereby, if the matter progressed to full trial, even if the claim were successfully defended (which was very unlikely in light of the expert evidence received) the costs alone could have been in excess of £100,000 (US$162,000) and there was only £25,000 (US$40,000) security. The judge suggested that the parties would benefit if they could reach a settlement between themselves, and after a full day of negotiations, the original claim of £370,000 (US$600,000) plus costs was settled for £142,000 (US$230,000) plus costs (which were a further £62,000 (US$100,000).

Sadly, naval architects can find themselves faced with claims even if they have not been negligent. In such circumstances, insurance which covers the cost of defence is invaluable. The price of innocence can be high.

A case in point is a naval architect who entered into an agreement in 2007 to design a jet-boat to be operated in Australia. The company which built the boat did not have insurance. The vessel was delivered in 2008 and in early 2009 the engine mounts collapsed and various other problems occurred which rendered the vessel unable to operate.

In 2010, proceedings were issued against the boat builder and the naval architect. The principal allegation involving the design related to the number of engine mounts installed. However, a comprehensive survey report found that the cause of the collapse was excessive use of the engine by the operator, rather than the mounts installed. The report further stated that the cost of rectifying the mistakes attributed to the design was A$20,000 (US$20,800). It later transpired that the total claim was for A$673,000 (US$ 700,000).

Mediation took place but the matter was not resolved. The builder advised that it could only contribute A$40,000 (US$41,000) towards the claim. The case went to trial and, as legal costs continued to rise A$150,000 (US$156,000) (at this point) the decision was taken to make an offer to settle. The naval architect, with the support of ITIC, made an offer of A$100,000 (US$104,000) which was not accepted and eventually a figure of A$300,000 (US$312,000) was agreed and settled, along with legal costs which totalled A$230,000 (US$239,000) .

The case is an example of an instance where, even though the architect was not negligent, as the builder did not have sufficient cover, the architect was forced to contribute more in settlement. Another example was a naval architect who was contracted to carry out the external design of a yacht newbuilding. After the yacht was completed and set sail, a guest fell down a small flight of internal stairs during the course of an onboard party, sustaining back and hip injuries as a result.

The guest sued, among others, the yacht owner, builder, surveyor and two naval architects. Legal counsel was appointed to defend the Australian naval architect. Despite the fact that any design fault involving the interior of the vessel bore no relation to the work carried out by the insured architect, the parties were jointly sued in the amount of US$1 million. Lawyers spent over US$150,000 - and seven years - trying to obtain a judgment removing the naval architect from proceedings, a costly event for something that was not even the architect's fault.

The moral of the story is that you don't have to make a mistake to be sued. In such cases, insurance can help. *NA*

Ship market lacks recovery momentum, structural reshuffle remains difficult

China Association of the National Shipbuilding Industry (CANSI) gives its analysis of the economic operation of the shipbuilding industry in the first half of this year

In the first half of 2012, China's shipbuilding industry has strived to tackle the difficulties of winning new orders due to the downturn of the global shipping market. While ship completion volumes, gross industrial output values and income from core business maintained steady growth, export volumes fell and profits shrank for the first time following 11 consecutive years of high growth. As the global economy and shipping sector lack the drive to bounce back, China's shipbuilding industry will face an increasingly severe challenge.

Oil and gas related transportation is expected to bounce back in the near future and yards such as Hudang Zhonhwa may be well placed to benefit

The fundamentals of economic operations

A slight increase in ship completion volumes: In the first six months of 2012, China's shipbuilding sector completed vessels of 32.20 million dwt, up 4.2% from the same period last year; received new orders of 10.74 million dwt, down 50.3% year-on-year. These shipyards had shipbuilding orders in hand amounting to 125.87 million dwt at the end of June, 30.7% lower than at the same time last year, and 16% lower that at the end of 2011.

Gross industrial output value showed a steady growth: During January to June, the 1,630 shipbuilding firms of a designated size (that is with annual sales of their core business reaching RMB20 million (US$3.17 million) and above) achieved gross industrial output values of RMB397.1 billion (US$62.98 billion), up 4.7% from the same period last year.

The industrial output value of shipbuilding businesses amounted to RMB299.9 billion (US$47.44 billion), up 0.5% year-on-year. The industrial output value of ship accessories was RMB56.5 billion (US$8.96 billion) in that period, representing a 25.8% increase from the same period last year. The industrial output value of ship repair businesses amounted to RMB8.79 billion (US$1.39 billion), up 9.8% year-on-year; while the industrial output value of ship conversions amounted to RMB15.7 billion (US$2.5 billion) which was 25.4% higher than last year's. The industrial output value of marine engineering equipment was RMB14.1 billion (US$2.23 billion), down 10% year-on-year.

Ship exports shrink year-on-year: In January-June, vessels completed for export totalled 26.34 million dwt, representing a growth of 1.8% year-on-year. Export ship orders received in the period amounted to 7.99 million dwt, which was 51.3% lower than the same period in 2011. By the end of June, export ship orders on hand amounted to 107.29 million dwt, down 30.8% year-on-year. The completion volume, new orders and orders on hand of exported vessels made up 81.8%, 74.4% and 85.3% of the country's total respectively.

In first six months of this year, shipbuilding firms of a designated size delivered exports of RMB142.9 billion (US$22.66 billion), down 9.3% from the same period last year.

The shipbuilding sector: Delivered exports of RMB131.5 billion (US$20.86 billion), down 9.6% year-on-year; the ship accessories sector delivered export of RMB5.26 billion (US$834 million), down 2.2% year-on-year; the ship repair sector delivered RMB2.18 billion (US$345 million), up 0.2% year-on-year; the ship conversion sector delivered export of RMB1.25 billion (US$198 million), down 10.8% year-on-year; the marine equipment sector delivered export amounted to RMB950 million (US$150 million), representing an increase of 48.1% from the same period last year.

In the first five months of this year, China's ship exports amounted to US$16.73 billion, a 2.1% fall from the same period in the previous year. China exported ship products to 149 countries and regions, with Asia and Europe remaining the major

Private yards such as Rongsheng may have a significant role to play when the global economy starts to grow

markets. China's ship exports to Asia totalled US$8.8 billion, making up 52.6% of the total ship export value. Ship exports to Europe amounted to US$3.07 billion in that period, occupying 18.4% of the total ship export amount.

Income from core businesses continues to grow: In the first five months this year, the shipbuilding industry, including only firms of a designated size, in China achieved income from their core businesses of RMB264.0 billion (US$41.87 billion), a growth of 5.3% from the same period of last year. Of which the shipbuilding sector made RMB194.1 billion (US$30.79 billion), representing a year-on-year increase of 0.5%; the ship accessories sector made RMB40.8 billion (US$6.47 billion), up 29.2% year-on-year and the ship repair sector made RMB5.48 billion (US$869million), up 2.2% year-on-year.

Total profits see a year-on-year decline: In the first five months of this year, China's shipbuilding industry with a turnover of RMB20 million (US$3.17 million) and over earned profits of RMB12.6 billion (US$2 billion) in total, a fall of 27% from the same period last year. Within this figure the shipbuilding sector earned profits of RMB10.3 billion (US$1.63 billion), down 32.3% year-on-year; the ship accessories sector earned profit of RMB1.55 billion (US$245 million), 5.4% lower than the same period in 2011 and the ship repair sector lost RMB24 million (US$3.8 million), earning RMB4.28 million (US$679,000 million) less than the same period last year.

The characteristics of Economic Operations

Shipbuilding completion volumes reached new highs; in the first half of 2012, China's shipbuilding enterprises tackled various challenges proactively to ensure smooth deliveries of vessels and to improve their companies' resilience.

According to shipbroker Clarkson's' statistics, based on dwt, the market shares of China in terms of ship completion volumes in the first six months, newly received orders in the first six months, and orders on hand as at the end of June reached 40.7%, 40.8% and 42.3% respectively in the international market. Based on compensated gross tonnage, China's market share in terms of the three aspects above all exceeded 35%. The country managed to maintain a relatively high market share even during the downturn in the international shipping market.

The structural reshuffle proved effective; fine market positioning achieved via market segmentation. In the first half of 2012, shipbuilding enterprises accelerated restructuring and operational reshuffles in order to adapt to rapid market changes. A slew of mid-sized shipbuilders with fine market positioning for products, accurate market segmentation and product specialisation have emerged.

Among these yards are Guangzhou Shipyard International Company Limited which has contracted with a Swedish shipowner to build a series of specially-designed IMO Type II 50,000dwt chemical/product oil tankers; Sinopacific Offshore & Engineering Co Ltd which has won LPG tanker orders amounting to more than one-third of the orders in the international market and orders for liquid tanks that ranked no.1 in the world; Fujian Shipbuilding Industry Group Corp which received orders for 24 offshore engineering vessels and its related company Xiamen Shipbuilding Industry Co Ltd which was about to build a 100,000gt luxury cruise ship; and Shandong's Huanghai Shipbuilding Co Ltd which has received orders for various types of deep sea fishing vessels.

Scientific research bolsters innovation: The 3,000m deepwater semi-submersible oil rig "Marine Oil 981", designed by China State Shipbuilding Corp's Marine Design & Research Institute of China (MARIC) and built by Shanghai Waigaoqiao Shipbuilding Company Limited, has successfully commenced its drilling mission in the South China Sea, marking a significant scientific achievement during China's 11th Five-year Plan period (2006-2010) and setting a new milestone of China's marine engineering design and construction capability.

The aerospace survey ships Yuanwang-3, Yuanwang-5 and Yuanwang-6 designed by MARIC and constructed by Jiangnan Shipyard (Group) Co Ltd have accurately monitored the docking of manned spaceship "Shenzhou IX" with space lab module Tiangong-1.

The manned deep-sea research submersible Jiaolong designed by a subsidiary of the China Shipbuilding Industry Corporation has reached a depth of 7,062m in the Mariana Trench, marking a major breakthrough of China's technology in the construction of manned submersibles and showing that the country's marine technology has reached an advanced level in the international arena. These achievements are important

to the development of China's shipbuilding industry, the exploration of marine resources and the protection of rights over the ocean.

Shanghai Merchant Ship Design & Research Institute (SDARI) has achieved a breakthrough in the research and development of high-tech vessels through winning a contract for the basic and detailed designs of a 30,000m^3 LNG tanker.

In addition, a breakthrough has been achieved in marine engineering equipment development with national policy support. In the first-half, China's shipbuilding enterprises have followed the mid-Long-term development plan for the marine engineering equipment sector closely, speeding up the development of the marine equipment industry and delivering a batch of advanced products, while acquiring a number of new orders.

Cosco (Nantong) Shipyard Company Limited has delivered its second circular drilling rig. Yantai CIMC Raffles Offshore Limited has delivered a semi-submersible drilling platform; and has won an order for a semi-submersible drilling rig from a Norwegian owner. Shanghai Waigaoqiao Shipbuilding Company Limited has won an order for a jack-up rig from CNPC Offshore Engineering Company Limited. China Merchants Heavy Industry (Shenzhen) Company limited has received an order for a jack-up rig by Jack-Up Barge B.V. from the Netherlands. Cosco (Nantong) Shipyard Company Limited and Cosco (Guangdong) Shipyard Company Limited have won orders for three tender assist drilling rigs from foreign shipowners.

Chengxi Shipyard (Guangzhou) Company Limited has signed a contract for the conversion of an FPSO. Wison Offshore & Marine Limited has won a contract for the engineering, procurement, construction, installation and commissioning of a set of floating LNG liquefaction, regasification and storage unit from Belgium's Exmar.

In the field of offshore engineering, Chinese shipyards have yielded relatively high rewards. CSSC Guangzhou Huangpu Shipbuilding Company Limited has contracted with Offshore Oil Engineering Company Limited to build China's first 3,000m multi-purpose offshore support vessel, Hai Yang Shi You-286. Dalian Shipbuilding Heavy Industry Company Limited has won orders for two semi-submersible residential platforms from Norway's Sirius Offshore Accommodation.

Cosco (Nantong) Shipyard has received an order for an offshore wind turbine installation unit from Denmark's A2SEA. According to initial estimations, China's shipbuilding enterprises have signed more than US$2 billion worth of new contracts for offshore equipment in the first-half of the year.

Management strengthened and risk resilience increased

A continuously weak ship market has brought new challenges to shipbuilding companies. China's shipbuilding enterprises have adjusted their operational strategies proactively, applied more stringent control over risks, located opportunities via refined segmentation, and have attained a breakthrough in terms of volume of new orders for high-tech vessels and offshore engineering equipment.

Against the backdrop of weak demand, shipbuilding enterprises must streamline their construction solutions, balance resource distribution, realise savings plans, raise production efficiency, focus on matching the new PSPC regulations, and ultimately apply rigorous control over construction and quality management, in order to manage the any risk PSPC may bring to shipyards. Facing falling ship prices and rising costs, shipbuilding enterprises must strengthen their control over cash flow and internal management, establish cost control mechanisms, standardise debt management and strengthen the centralisation of cash flow management, so as to enhance risk control capability.

Shipyards face inadequate market demand

In January-June, new deliveries remained slow and Chinese shipyards have only received orders totalling 10.74 million dwt, amounting to only 33% of the volume of new vessels completed in the same period of time.

Meanwhile, hit by a weak demand in the dry bulk ship market, cancellation volume has risen. In the first-half, there were 41 cancellations in China totalling 2.58 million dwt, amounting to 1.3 times of the total cancellation volume of the full year of 2011. The volume of new vessel transactions has been lower than new ship completion volumes for 18 consecutive months, following a sharp drop in orders to Chinese shipyards.

As of the end of June, orders in hand at Chinese shipyards amounted to 125.87 million dwt which is not enough for full operations in all shipyards. According to estimates based on orders in hand, the majority of shipyards do not have enough orders for full operations in 2013 and some cannot guarantee full operations in the second half of this year.

Delivery becomes a challenge

As the shipping market remained weak and shipowners have sustained continuing losses, the difficulties of delivery that used to affect mainly mid- to small-sized shipyards have spread to the major shipyards. There were increasing numbers of requests from shipowners for changes on design, amendments of contractual deadlines, stricter surveys and ship price adjustments. With various new international standards being implemented, new ship deliveries have become more difficult. Delays in delivery have increased as some shipyards have applied a rather loose management style, thorough a lack of understanding of international standards the yards could not accommodate more stringent requirements from shipowners.

Shipyards face cash flow problems

Banks have tightened credit as a result of the global financial crisis, making it more difficult for shipowners to raise funds. This has meant that the amount of first instalment payments has dropped from 40% of the total ship price to 10%. As the proportion of payments made in a later stage of production has risen, enterprises are facing more serious cash flow problems. According to statistics, in the first five months of this year, shipbuilding companies' account receivables have climbed 26.6% from the same period last year; debts have risen 9.5% year-on-year; interest payments have increased 43% year-on-year; and financial fees have surged 77% year-on-year.

Since the beginning of the year, financial institutions have tightened credit and it has become harder for shipbuilding companies, especially small and medium-sized yards, to obtain financing and prepayment guarantees. Some shipyards were unable to accept new orders because the financing was unobtainable.

In addition the ship prices of the three major ship types built by Chinese shipyards have continued to fall amidst a stagnant market. Shipyards have been receiving orders that brought negative gross profits as ship prices keep falling while costs keep increasing. Based on statistics, in the first five months of the year, the income from the core business of the shipbuilding sector has edged up by 5.3% from the same period last year; however, the cost related to the core business has risen by 7.2%, a growth that is 1.9% higher than the increase in core business income. Profit margins are only 4.77%, down 30.7% from the same period last year. The number of loss-making enterprises climbed to 347 with total losses made increasing by 62.9%. Small- and mid-sized firms are facing severe challenges; bankruptcies and lay-offs have become more common.

Market forecasts

According to experts, the imbalance between demand and supply in the global ship market will be difficult to solve and that the market will continue to be slow meaning that the chances for a rebound in demand in the short term are slim. The same experts say global demand for different types of new ships has changed compared to last year. Despite the transactions for bulk carriers remaining sluggish, bulk vessel transactions still made up the largest portion of the market. While transactions of oil tankers has bounced back slightly; transactions for ship types that are related to oil and gas exploration and transport such as gas tankers, drilling rigs, production rigs and offshore support vessels has become more active. However, the containership market, especially that of the ultra-large box vessels, remains very weak.

China's ship market has seen structural changes in demands. It is expected that there will be considerable demand for LNG tankers, offshore engineering equipment, energy-saving green ships, specialised vessels, deepwater fishing vessels, fisheries administration ship, and coastal and large-scale inland river vessels.

Policy suggestions

First of all, companies must promote more economical, energy efficient and thereby environmentally friendly ship models through all means. It is suggested that tailored marketing strategies should be applied to different shipowners via various channels. Companies must collect market information from a wider network to win every possible order.

Companies must also seek new clients, while companies continue to bolster their relationship with existing customers they should also build relations with new clients via vertical cooperation in order to seize the opportunities brought by the construction of China's national deepsea fleets, the exploration of the South China Sea and marine rights protection. Shipyards should proactively fight for orders from Chinese energy enterprises, leasing companies and fund management companies.

Furthermore, companies must seize the opportunity arising from the structural changes in the international shipping market. Companies should strive to win orders for VLCCs, LNG tankers, containerships of more than 10,000TEU, offshore engineering equipment, fisheries administration ships and specialised vessels.

Quality control

Shipbuilding enterprises need to stick to the technical standards and treat contract requirements seriously, while at the same time communicate with shipowners in a proactive manner and strengthen the control over the production process to ensure construction quality. Shipyards must emphasise the need for quality accessories and improve their quality control capabilities and the quality of their products, in order to avoid late deliveries due to quality issues.

Related government departments must also apply more resources to support research and development projects for shipbuilding enterprises; guide companies to upgrade their product portfolio to include more sophisticated ship types; help companies to build their own brands and encourage merger and acquisition between shipyards to streamline production capacity and eliminate outdated production lines. This will allow resources to be allocated to the most competitive players and ease overcapacity while accelerating the restructuring of the sector.

Shipbuilding enterprises must also maintain a tight grip on the front-line market and seize the opportunities arising from the replacement and upgrade of major ship types in the market. Companies should focus on research and development of various ship types including environmentally friendly, energy efficient green ships and offshore engineering equipment, so as to match the changing demands for different products.

Controlling cost efficiency

As ship prices have fallen close to shipbuilding cost levels, cost control is the key to reducing losses and making a profit. Shipbuilding companies must fine-tune their operational strategies to enhance the competitiveness of their products in terms of quality, function, price, payment method, construction period, and financing arrangements; and to apply stringent risk controls.

Reducing production pressure

Shipbuilding is a cyclical industry. During a market downturn, shipyards have to strengthen their core business through product upgrades, on the one hand while mid-sized companies and big enterprises have to work together to achieve business diversification on the other. Sizeable companies should leverage their strong capital advantages to reduce risk through vertical and horizontal expansion.

During the12th Five-year Plan period (2011-2015), the government will strengthen its support to major industries, such as marine, new energy, new materials, mechanical engineering, logistics, energy saving and green industry, rail transport equipment, intelligent manufacturing equipment and new power battery material etc, providing further opportunities for shipbuilding enterprises to diversify their businesses. *NA*

Squeezing the middle

The proverbial rock and a hard place meet somewhere near Busan as small to medium yards finally succumb to years of slack orders, fierce competition and global recession

It is of little consequence to the workers of Sungdong Shipyard on Geoje Island that the recession may finally end and growth could be seen somewhere near the end of 2013.

Most Korean maritime industry observers believe that there will finally be an increase in orders at that time as the slack in the system – in this case over capacity in almost all the major ship operating sectors through over-ordering, a collapse in the global economy first initiated by the 2007 banking crisis and maintained through the Euro crisis to this day - eases.

HK Choi, the general manager at Hyundai Mipo, says that the orderbook for all ship types will not be in equilibrium, that is new ships being ordered to replace those that have come to the end of their life and to cover any growth in markets, for up to another three years.

In 2007 an equivalent of 55% of the global fleet was on order, that figure has now declined to 23%, but Choi says that allowing 4% for replacement vessels and another 3-4% for growth would mean the industry needed to build at the rate of around 7-8% of the global fleet, or around 130 million dwt a year.

With a two year orderbook to be maintained yards would need only 15% of the world fleet to be on order at any one time. As growth has slumped and markets contracted and with the over-ordering of the previous years the over-capacity in most major shipping markets is likely to continue for some time to come. And that will mean fewer orders and a squeeze on yard over-capacity.

Major yards may be able to switch production to other markets, particularly the offshore sector, but the small and medium sized yards will be very vulnerable to this market downturn.

The crisis may well have already claimed Sungdong as a victim, however, as the yard is already in the hands of the receivers. Such is the harsh reality of twenty first century economics. The tragedy is further aggravated by the knowledge that other yards have already lost their battle for survival. Samho Shipbuilding, 21st Century and Shina SB have all reportedly succumbed to the economic storm that is currently holding commerce in thrall.

SPP cannot compete with Chinese yards on bulk carriers so it will concentrate on high value ships, says SPP executive VP Socrates Park

As far as 21st Century is concerned, the company has run down its orderbook and there is no longer any work. This means that the banks, willing to finance the running of a yard until it fulfils its contractual obligations, will then pull the plug on any new financing effectively killing off the yard.

This is the process that Sungdong is currently undergoing as Bonick Koo, the executive vice president at Sungdong, explains that the yard entered a contractual agreement with the Korean Exim Bank, which was acting as the agent for Sungdong's creditor banks.

The first contract signed in August 2010 included a plan that would revive the yard. The plan included an agreement by creditors to keep providing refund guarantees in return for cash savings made through selling assets.

"By December 2011 we found that we could not improve the situation of the yard so we needed more cash and our creditors agreed to inject several hundred million dollars, but Kang Yang-soo [the former senior vice president] quit his position and the bank appointed Sung Yang Ha, an expert in running troubled companies to run the business," explained Koo.

He went on to say that the banks would eventually convert their credit into shares and will ultimately own 90% of Sungdong shares, currently the Jung family hold 47% of the company's shareholding with the Korean Military Pension Fund holding a further 34%, Sungdong 7% and 12% is held by small investors.

The financial collapse of Sungdong is symptomatic of the problems facing all the small to medium sized yards. In 2009 the yard had no orders until the final two months of the year. In 2011 the yard received less than 10 ship orders and this year the figure stands at around 10 ships on order.

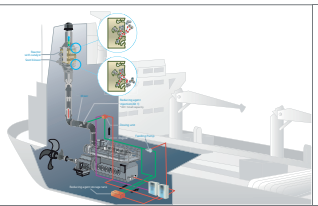
"The market is still moving, it is consistently falling and the market is now too low priced to make a profit on all types of ship," complained Koo. He said that Chinese yards of a similar size were building ships that were 20-30% lower in price than Korean yards.

He pointed to a Chinese yard that won a contract to build a 208,000dwt bulk carrier, offering the vessel build at US$47.5 million. "I think the construction costs for that bulk carrier is more than US$60 million, steel plate, equipment and materials are all a similar price to us, but their labour costs are lower," explained Koo.

In order to compete with the Chinese yards the Koreans are looking to build ships faster, improving productivity, but even so the orders remain thin on the ground, with normal profitable production levels at around 40 ships a year, the 10 orders

TOUCH GREEN!

PANASIA has a mission of 'reinforcing the competitiveness of on shore, off shore plant/marine equipment industry' by securing original technology. In order to transform the nature of products into eco-friendly products, PANASIA has constantly invested and as result, nearby 200 patents were acquired at present.

		
BALLAST WATER MANAGEMENT SYSTEM GloEn-Patrol™ GIII	De-NOx SCR SYSTEM PaNOx™ Marine	Smart Radar Sensor PanX™ LEVEL TRANSMITTER LEVEL-3000™
Ballast Water Treatment System	De-NOx SCR System	Tank Level Gauging System

PANASIA CO., LTD.

Head Office | 1559-3, Songjoeng-dong, Gangseo-gu, Busan, Korea TEL. +82-(0)51-831-1010
E-mail. panasia@worldpanasia.com
Gimhae Factory | 715-1, Yongdeok-ri, Hallim-myeon, Gimhae-si, Gyeongsangnam-do, Korea
TEL. +82-(0)55-310-3300 E-mail. enc@worldpanasia.com **www.worldpanasia.com**

PANASIA
www.worldpanasia.com

SPP will follow market demand and will start to build chemical and product tankers says the yard management

received this year are not nearly enough to cover the yard's costs.

In such a challenging climate Sungdong has devised a strategy to cut its costs. "The plan is to shut down one third of the yard," explains Koo, "we have six skids and will shut down two next year and we are looking to subcontract offshore work from larger yards if there are still no meaningful orders in the third and fourth quarters."

To say the orderbook in Korea's yards has diminished is to understate the case. In fact this year has seen such a poor performance by the Korean yards across the board that the member yards of the Korean Shipbuilders' Association (KOSHIPA) have instructed their representative body to withhold details of this year's new orders.

Not all of Korea's yards are suffering in the way that Sungdong and 21st Century are, at least one, SPP, claims that it is maintaining its position in the market and hopes to come out of the recession stronger.

"Some 80-90% of our employees are former Hanjin workers," explains SPP executive vice president of the sales and marketing department Socrates Park (known as Socrates following his placement in Athens). He went on to say that the company has retained some 1,000 direct employees, many of them former Hanjin designers, and around 5,000 sub-contractors.

Park says that SPP has concentrated on around six vessel types over the last five years, Kamsarmax, Handymax and Supramax bulk carriers and medium range tankers, around 50,000dwt and long range tankers of 73,000dwt and 113,000dwt.

"We cannot compete with the Chinese on bulk carriers, now," explains Socrates so the company will concentrate more on high value vessels. In future SPP will look for orders of small to medium sized LNG and LPG carriers as well as ethylene tankers.

"In 2016 environmental regulations will change and we have requests from clients for new dual-fuel designs and we must follow market demand," says Socrates.

SPP is looking at the closure of chemical and products plants in the US and Japan with new manufacturing centres being built in Saudi Arabia and India. SPP will look to take advantage of the chemical shipping demand that will be derived from these new plants.

"We can't compete with the big yards for large vessels but small to medium sized ships, 10,000m^3 LNG bunkering vessels, 12,000-22,000dwt ethylene carriers and 38,000dwt prismatic LPG carriers are a possibility for us," claims Socrates.

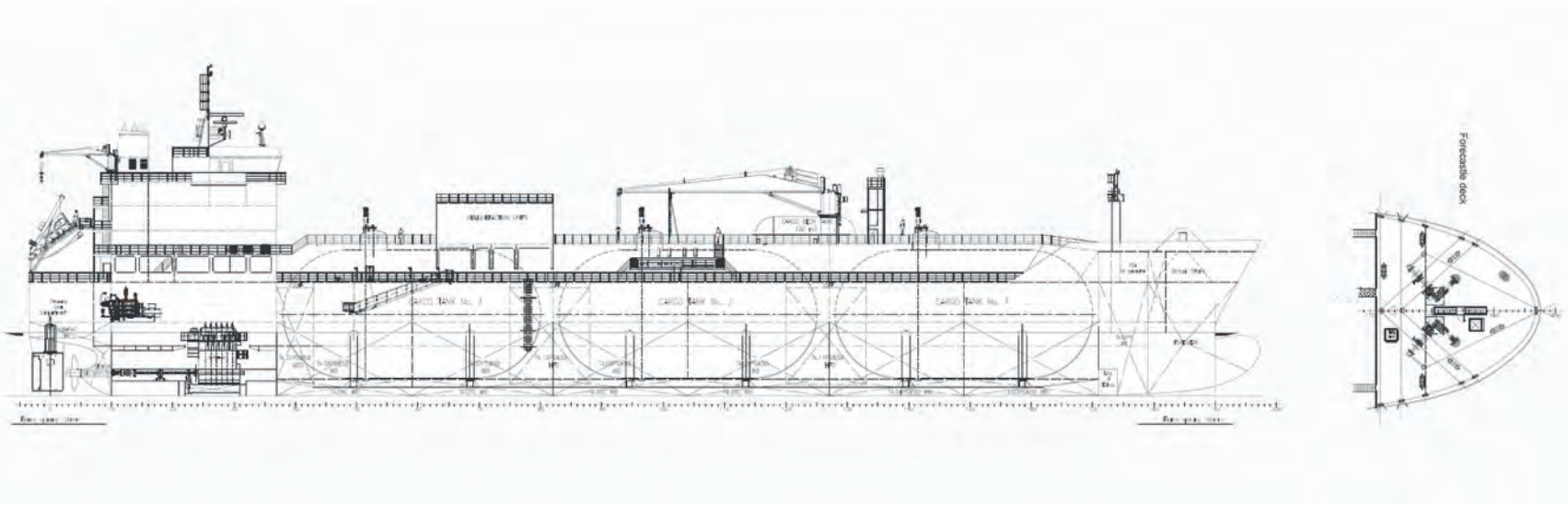
The yard is currently developing the design concepts for these new vessels with Wärtsilä and MAN Diesel & Turbo. For example the 50,000dwt MR tanker will have a reduced fuel consumption of 23tonnes/day, "the lowest fuel consumption in the world," claims Socrates.

In addition slender hull forms along with electronic injection and optimised shaft and propeller functions will help to maintain the fuel efficiency of the new designs. Even with SPP looking at successfully holding on to its tanker business while conceding bulk carriers to the Chinese, the wider Korean picture is of a shift to new markets.

It is no secret that around 60% of new orders in South Korea have been in the offshore sector and that the offshore market is beginning to challenge the shipbuilding sector for top spot at Korean yards.

The big three yards, Samsung Heavy Industries (SHI), Hyundai Heavy Industries (HHI) and Daewoo Shipbuilding and Marine Engineering (DSME) are all attempting to diversify their workload by looking to the offshore sector for orders. The LNG shipping sector remains the one bright spot in an otherwise difficult market.

GA Plan for 12,000m^3 LEG Carrier



TECHNICAL PARTICULARS

12,000 CBM LEG Carrier

Length, oa Appx. 140.00m
Length, bp 132.00m
Breadth, moulded 23.00m
Depth, moulded 13.00m
Draught
  Design, moulded 6.70m
  Scantling, moulded Appx. 7.30m
Deadweight
  Design Appx. ..... 8,200 tonnes
  Scantling Appx. ..... 9,600 tonnes
Tank capacity
  Cargo abt. ..... 12,000 m^3
  Ballast abt. ..... 6,900 m^3
  Heavy oil abt. ..... 1,000 m^3
  Diesel oil abt. ..... 215 m^3
Main Engine
  Design ..... MAN B&W
  Model 6S35ME-B9.2
  Number ..... 1 set
  Output ..... MCR 5,220kW x 167.0rpm
    NCR 4,698kW x 161.2rpm
Ship's Speed
  Service speed (at design draft of 6.70m and at NCR with 15% sea margin)..... Appx. 15.0knots
Fuel oil consumption of main engine
  S.F.O.C (LCV of 10,200kcal/kg at MCR) ..... Appx. 175.0 gr/kW.hr
  D.F.O.C(LCV of 10,200kcal/kg at NCR).....Appx. 19.5 tonnes/day
Max. cruising range (LCV of 9,800 kcal/kg at service speed).....Appx. 15,000 nautical miles

Hyundai Heavy Industries says that today only 35% of its business is shipbuilding, while the offshore sector has grown to 20-25%

Hanjin Heavy Industries and Construction (HHIC) is still trying to overcome the effects of a prolonged industrial dispute with angry yard workers who protested at the loss of work to HHIC's Filipino subsidiary in Subic Bay. However, the Korean yard has also succumbed to the draw of the offshore sector and will be manufacturing steel frames for oil rigs in the Philippines also.

Last year HHIC won its first contract at its Yeongdo yard in three years signing a deal to build four 4,700TEU container ships and a two logistics support vessels with the contracts worth a total of US$250 million.

DSME is concentrating on larger ships in every sector. "We rarely accept orders for bulk carriers," says Sang-Kyu Lee an associate at the corporate unit at DSME, "if we do it's 300,000dwt plus or ore carriers, while 20% of the vessels now on order are LNG ships and 30% of contracts are for the Triple E class container ships and other large [8,000TEU and above] container ships," he adds.

The remaining ships on order at DSME are VLCC's and con-ro vessels.

In addition DSME has made an attempt to enter the lucrative cruise shipbuilding market, but Lee admits this is a difficult market to break into. "Cruise ships have difficult technologies associated with them, anti-rolling, low noise," he says, adding that it is "difficult to find interior designers".

Following DSME's completion of a 100,000dwt ro-pax ferry for Tunisian operator Cotunav DSME says it will "move away from cruise ships".

As the larger Korean yards have found other niches to supplement their declining shipbuilding business the small and medium sized yards have been left to slug it out with the shipbuilding competition, particularly in the nation's near neighbours China and Japan.

Hyundai Heavy Industries (HHI) is also undergoing a transformation of its business with the company saying that only 35% of its business came from shipbuilding while the offshore division has grown to 20-25% of the company's income.

HHI general manager Choi Won-su told The Naval Architect that the yard had completed 93 ships in 2011, but this year that figure will decline to 85 ships.

The yard has signed a contract with a European owner to build 10 energy efficient 13,800TEU container vessels that will be chartered by Evergreen for a 10 year period.

Hyundai has also agreed a deal with Singapore-based owner APL to build 10 ships of 13,800TEU each that are optimised for operations on the Asia/Europe trades. The ships will have optimised hulls and derated electronically controlled engines with larger propellers offering significant fuel cost savings.

HHI has announced a number of developments that will improve the fuel efficiency of its ship designs including improved hull designs, but the company has also introduced a the HHI VS Propeller that it says avoids wake cavitation and improves the power provided by the propeller.

Not all medium sized yards have succumbed to the fluctuations of the market. Hyundai Mipo and Hyundai Samho have surely benefitted from being an affiliate to the much larger HHI. Even so Choi admits that Hyundai Mipo "cannot make profits right now".

Competition with the Chinese has focused the yard's energy into building more sophisticated ships such as LNG carriers, bitumen carriers, LPG tankers and medium range tankers which the Chinese competition will find difficult to manage due the complexity of these designs. *NA*

Equipment manufacturers hit by declining yard orders

Korean equipment manufacturers are looking for new markets abroad as a slump in demand for new ships in Korea is taking its toll on the suppliers. Consolidation of marine equipment manufacturers appears inevitable as the highly fragmented sector feels the full effects of the recession

Manufacturers of marine equipment in South Korea, such as deck cranes, pumps, air conditioning units and the like are suffering a severe dip in orders as the major Korean yards switch production to the offshore business.

According to Bong-Ki Kwon, an international cooperation department manager at the Korean Shipbuilders' Association (KOSHIPA), more than 60% of new contracts at Korean yards are now for the offshore business. Kwon says that new orders for the first quarter this year are down by 37% on last year's figures, 1.7 million cgt, compared to 2.7 million cgt in the same period.

In addition Kwon says that the yards' orderbook has declined by 12%, from 35.4 million dwt in 2011 to 31 million dwt this year.

"Small to medium sized yards are suffering the most, the major yards have received orders for offshore plants, but the smaller yards may not have the facilities or the manpower to change to offshore," says Kwon.

KOSHIPA says the market has been hit by a decline in EU consumption and Kwon says there is no expectation that the market will recover next year. That means there is an excess of shipbuilding capacity and the major yards are therefore diversifying into the offshore market.

That is bad news for the Korean equipment suppliers as some 80% of equipment used in the offshore business is imported. When the yards were focused on building ships Korean equipment manufacturers held an 80% market share of the marine equipment business.

As a consequence of the decline in ship orders and therefore equipment orders the Korean manufacturers are looking to markets abroad in an effort to maintain profits.

The Korean Marine Equipment Association (KOMEA) has established a website www.shipsol.com on which Korean companies can advertise their equipment on the internet. The site was developed through KOMEA two to three years ago said KOMEA support manager Allen Kang.

"Korean companies are marketing their equipment in Japan, China, The Philippines, Vietnam, Indonesia, India and Sri Lanka," explained Kang, and manufacturers are able to update information through the website free of charge.

"Small to medium sized yards are suffering the most, the major yards have received orders for offshore plants, but the smaller yards may not have the facilities or the manpower to change to offshore"

Nevertheless, the view from some manufacturers is that many small companies will go bankrupt over the coming year or two as companies fail to pick up any new orders.

"Already many companies are in the control of receivers, next year will see many bankruptcies. Those companies that are involved in the offshore business should be OK, but those only involved in shipping will have problems, the positive thing is that the major yards will still need Korean manufacturers," explained one manufacturer.

The feeling amongst some Korean manufacturers is that the surviving companies will grow stronger as they increase their market share following the demise of the weaker companies, though the feeling is that the "Korean market will become inevitably smaller as work moves to China".

Effectively the recession could well prove to be a turning point for the Korean shipbuilding industry as consolidation in both the yards and manufacturers sees the sector shrink, but leaves those still in the business significantly stronger than the pre-crisis companies.

Companies such as Hi Air and NK that have their own systems and have the ability to invest in further development will remain competitive and will be able to see the crisis through. "But smaller players in a fragmented market will go," says the manufacturer, he added that many deck machinery companies are vulnerable.

Spokesmen for a number of small to medium sized yards in Japan admitted to using cheaper Korean imports for some equipment, however, the Japanese yards were reluctant to admit the extent of the foreign imports, the issue is a sensitive one as Japanese manufacturers are themselves under pressure.

In China too the equipment manufacturers are feeling the pressure from the slump in demand, but both Japanese and Korean suppliers are unable to compete on price with Chinese manufacturers, however, many Japanese and Korean yards pointed to the lack of quality which was seeing many buyers returning to the more expensive Korean market for their equipment. This was, however, pure speculation as there are no supporting figures for this view. *NA*

HHI — Building a better future
Global Leader

www.hhi.co.kr

We Build a Better Tomorrow

As the world's leading shipbuilder, Hyundai is unrivaled in building quality ships as well as in meeting clients' specific needs.

Whenever we build ships for our clients, we build ships of shared dreams.


LNG Carrier


Containership


LPG Carrier


LNG-FPSO

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

BWTS companies gear up for big instalment push

Ballast water treatment system (BWTS) manufacturers are in the process of modifying their systems and companies in readiness for what they expect will be a major push to meet new regulations

If and when the BWTS regulations are finally ratified by the requisite nations at the IMO the BWTS manufacturers will be faced with an uphill struggle to fit systems to the global fleet in time, says one major BWTS company.

A Techcross spokesman told *The Naval Architect* that the company believes: "there will be less than 10 manufacturers that will be eligible [to sell their systems] and there is no way that the BWTS manufacturers will be able to meet that demand."

As a result owners believe that the deadline for fitting the systems will, necessarily, have to be extended.

Techcross established a sister company, called Lastech, in June this year for the purpose of installing its Electro-Cleen systems which, disinfect ballast water through a process of electro-chlorination.

"Lastech will be operational by the end of this year," says Techcross who are in the process of recruiting and testing for Lastech. The company has been established especially to retrofit systems. "It means we can offer a full package of the BWTS and fitting to owners".

A second factory could also be opened with a larger manufacturing capacity, says Techcross, which is in the process of evaluating candidate sites.

NK, a Techcross competitor, is also preparing for a significant increase in the number of orders it gets for its ozone BWTS NK-03 BlueBallast System. The company has already sold 65 systems to date with a further 13 options and 17 already installed. There has already been a significant increase, with the company securing US$10 million in orders in 2010, but that rose significantly to US$70 million by the following year and NK says 2012 orders will top US$95 million.

However, NK's research and development department is working to reduce the power output necessary to operate its BWTS. The company has already improved the system with a combined compressor and oxygen generator for the three smaller models, handling up to 1,000m^3 of ballast water.

The combined system has not only reduced the operating power necessary, but has also reduced the space needed for the BWTS onboard the ship. The company says that: "in the near future all of the BlueBallast System models [in all sizes] will be a single unit instead of many".

According to the company, this will reduce the installation costs by some 70-80% because the system will be a "plug and play" system that is very easy to install.

Meanwhile, Panasia is seeking approval for a second BWTS that uses electrolysis to disinfect the water. The company already produces a UV-based system, known as GloEn-Patrol, but the company says that some customers prefer electrolysis systems. Panasia has submitted plans for its latest BWTS to the IMO and it is now awaiting approval for the system.

Details of how the BWTS operates are not yet available, however, Panasia says it is a "smart electrolysis system" and is expected to come to market in around a year's time.

In addition Panasia has further developed its GloEn-Patrol system which, in its original form operated with six filters. The new version, GloEn-Patrol G2, has a single "multi-caged filter" for BWTSs that disinfect between 1,200-3,000m^3 of ballast water and which requires considerably less space than the original system.

Panasia says that it has delivered 82 GloEn-Patrol systems and has contracts for a further 211 BWTS. The company also highlighted the fact that most owners that have already fitted BWTS are not operating the systems.

"Many owners have fitted BWTS to their newbuildings because it is far more expensive to retrofit BWTS, but owners are not running the systems at the moment because they don't need to," explained a Panasia spokeswoman.

According to all three BWTS suppliers owners are reluctant to operate installed BWTSs because it increases the power usage and, thereby, increases fuel consumption. GloEn-Patrol uses around 20kW to process 150m^3/hour. Larger ships would need to process far larger amounts of water, around 1,500-2,000m^3/hour, but the company emphasises that this does not mean that the system will use 10 times the power, but Panasia was unwilling to be precise about the power usage of its system.

NK is clearer about the BlueBallast System which uses 38.2kW for a BWTS that processes up to 150m^3/hour and the power usage increases through to the largest size which ist says uses 725.4kW in processing up to 4,000m^3/hour.

Techcross says its system uses 1.7kW to treat 100m^3/hour of normal seawater, this means that there is no need for supplementary power generation.

All the systems will consume some power and that will add to the cost of operating a vessel, though the amount of consumption from the BWTS would depend on the ship type and the regions that it operates in. However, supplying and fitting the (approximately) 70,000 ships in the global fleet may prove a tall order for the manufacturers who are still having some difficulty persuading owners that the BWTS is coming and that they *will* need to comply. ***NA***

International Conference

THE DAMAGED SHIP II

30-31 January 2013, London, UK

Second Notice

Following on from the success of the first RINA international conference on The Damaged Ship; this event will focus on the assessment and analysis of stability, strength, sea worthiness of a ship damaged by collision, grounding, structural failure, fire or explosion. It will also consider procedures to minimise risks for passengers, crew, ship, environment and to develop safe countermeasures including sequences for transferring, offloading cargo and ballast water for salvage operations.

After any major accident it is imperative to rapidly quantify the damage, assess damage stability and the residual strength of a vessel. Damage stability appraisal should also consider the likelihood of progressive flooding, capsizing probability and effect of waves on stability. There is a need to consider both the global strength capability of the ship structure and the local residual strength of damaged and buckled plating and the effect of flooding on internal structure. Although too early to draw conclusions, the Costa Concordia accident once again reinforces the need for a better understanding of a damaged ship's behaviour.

A number of organisations already offer ship owners a range of Emergency Response Services (ERS) including shore-based expert assistance and computer-based contingency planning systems. The aim of this conference is to bring together designers, operators, classification societies and legislative government bodies to consider the present state-of-the–art and future developments. Papers are invited on all aspects of assessment and analysis of the damaged ship, including but not limited to:

- Damage assessment
- Stability and seakeeping of the damaged ship
- Global and local integrity of the damaged ship
- Modelling of the damaged ship
- Flooding simulation tools
- Stability in waves.
- Pollution mitigation
- ERS planning and decision support systems
- Regulation on damage stability
- Education and training on damage stability

Royal Institution of Naval Architects

www.rina.org.uk/damagedship2013

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

☐ I would like to receive a full programme brochure and registration form

Name: Position:

Company:

Address:

Postcode:

Telephone: Fax:

Email: **(DAM2013)**

Please return to: Conference Department, RINA, 10 Upper Belgrave Street, London SW1X 8BQ
by fax on +44 (0)20 7259 5912 or by email: conference@rina.org.uk

FIREPROOFING passenger ships

The continuous increase in size and complexity of passenger ships has not been properly supported at the regulatory level. A rationalised fire safety framework is needed that does not penalise arrangements falling outside the constraint of past experience and that nurtures innovation

Analysis of historical accident data for passenger ships has demonstrated that fire and flooding (the latter primarily due to collision and grounding) constitute 90% of accidents where ships had to be abandoned, and fire frequency is some eight times higher than flooding. From a regulatory point of view, this evidence conflicts with the growing trend in the industry for more innovative ship arrangements, where size and complexity dominate the market expectations.

SOLAS Ch.II-2 addressing fire safety is largely based on past experience and vulnerability analysis of a selected set of fire scenarios. Steps to improve this situation have been taken with the introduction in 2002 of Regulation 17 for alternative designs, but a holistic and comprehensive treatment of fire risk has yet to appear.

The European research project entitled *Probabilistic Framework for Onboard Fire Safety* project (FIREPROOF, www.fireproof-project.eu) has set out to change this situation by developing a Risk-based Design (RBD) assessment framework. At its heart lies the holistic performance assessment of a passenger ship with respect to both fire occurrence and the ensuing societal consequences.

$$fr_N(N) = \sum_{i=1}^{n_{space}} fr_{ign}(space_i) \cdot pr_{esc}(space_i) \cdot pr_N(N \mid space_i)$$

- Frequency of ignition in a space "i" per ship-year
- Probability of fire escalation outside the space of origin
- Probability of experiencing exactly "N" fatalities due to an escalated fire in space "i"
- Sum over "n" spaces: a holistic approach
- Frequency of exactly "N" fatalities per ship-year

Figure. 1

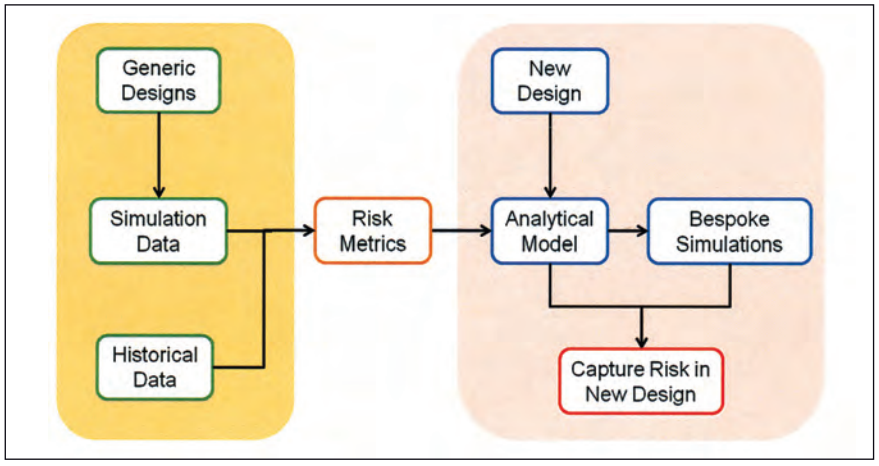
The probabilistic framework

FIREPROOF was defined as a sequel to the SAFEDOR project (www.safedor.org) specifically addressing fire risk analysis for passenger ships. Its aim is to build on the systems and methods developed within that precursor to develop a regulatory framework capable of ensuring fire safety of novel and existing designs through the application of the Risk Based Design methodology enabling the rational assessment of fire risk. In the context of FIREPROOF, the outcome of a fire accident is related to the societal consequences – the number of fatalities in the exposed passengers and crew onboard a ship.

FIREPROOF will condense its findings in a probabilistic framework in direct analogy to the one in SOLAS, Ch. II-1, which is currently under revision in the GOALDS project (www.goalds.org). FIREPROOF's findings are intended to be submitted to IMO (FP sub-committee) for discussion and further consideration.

Within the probabilistic damaged stability framework, survivability is represented by a subdivision index, which is a summation of the product of probability of flooding for each compartment and the probability of surviving flooding of that compartment. Weighting factors are included to account for the effect of different loading conditions. Similarly the FIREPROOF framework considers the probabilities of ignition within a given space, and a probability of

Figure. 2



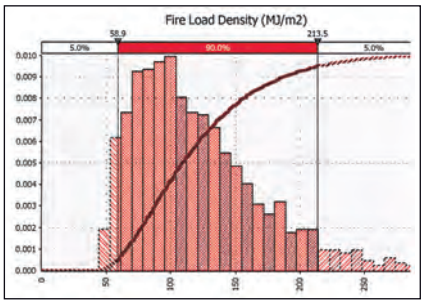


Figure. 3

"fire protection", a concept that includes detection, suppression and spread. The relevant weighting factors represent space criticality, e.g. fire effluents, occupancy, space topology and proximity to staircases, fire mains etc.

In Risk Based Design, risk is defined as *the chance of a loss* and, for practical purposes, is expressed as the frequency of occurrence of exactly N number of fatalities per ship-year (s-y). Developed from the broad approach used in SOLAS Ch.II-1 (probabilistic damaged stability), the FIREPROOF methodology can be summarised in the formulation shown in Figure 1. This formulation allows the risk to be expressed in one of two conventional ways; as a Potential Loss of Life (PLL) or an F-N Curve. The use of these methods is being investigated as part of the FIREPROOF project.

There are several key points regarding the population of this equation with numerical data, which address the physical nature of fire and compliance with concepts and definitions laid down in SOLAS Ch.II-2.

Fire *ignition* is treated as an event that can take place at any time and in any space onboard without reference to its root causes. It is presented probabilistically, as a frequency of occurrence per ship-year, for each of the 14 types of spaces prescribed in SOLAS.

The *escalation* of fire outside the space of origin is associated with failure to contain, control and suppress the fire by onboard means (mechanical or manual) and through human (passenger or crew) intervention. Fire escalation signifies the exposure of passengers and crew, located in the same fire zone, to the fire effluents (poisonous gases, oxygen depletion, heat, and visibility impediment), which could result in injuries and fatalities. Fire escalation is also described probabilistically.

The *consequences* in this framework correspond to loss of life, which occurs due to exposure to fire effects. This exposure is a result of the physical effects of the fire (heat, smoke, toxic gases) and the time taken to complete the evacuation process. The latter element incorporates the effects of the arrangement of the ship and the potential blockage of the main escape routes due to fire.

The resulting fire risk is expressed as the frequency of a number of (statistical) fatalities that could occur due to the fire occurring in a space per ship-year. Following the basic premise of the Risk Based Design methodology, a *holistic* risk assessment process is utilised, implying that the total fire risk should correspond to the *summation* of all risks due to all fire occurrences in all spaces onboard. It should be noted that summing this risk over the range of possible fatalities (i.e. from N=1 to N=total population) would give the expected number of fatalities per ship-year.

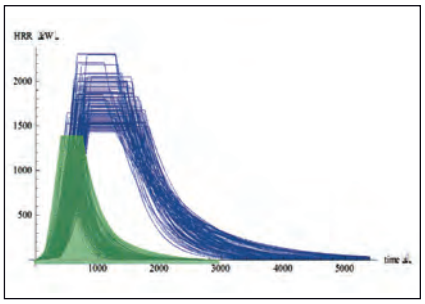


Figure. 4

Application of the methodology

The objective of the FIREPROOF methodology is to capture and describe the risk in new designs, to indicate which design options are safe and which are not, and to indicate where the risk lies in the design. Risk in a new design is to be assessed using a combination of analytical risk metrics and bespoke simulations performed on the proposed design configuration, as shown in Figure 2.

The analytical risk metrics are derived from a combination of historical data and simulations on generic models representing realistic ship layout features. These risk metrics represent knowledge about the relationships between ship features and the resulting fire and evacuation effects, where the knowledge has been gained from multiple simulations. These risk metrics, under development in the FIREPROOF project, are formulated in such a way that they can be applied to the new layout, being sensitive to those arrangement features found to determine the consequences of a fire. The use of simulations as a source of knowledge in combination with historical data is a key concept within the FIREPROOF methodology. It allows incidents that, fortunately, have not yet occurred to be examined, and the simulations can be developed in a structured and systematic manner.

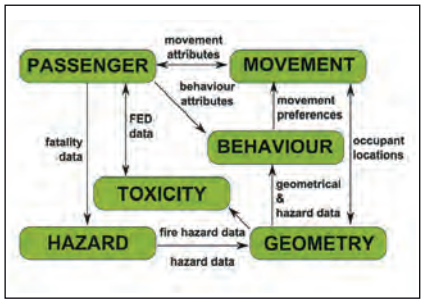
One of the motivations behind the FIREPROOF project is the increasing interest in novel layout configurations and this means that the risk metrics may not always be applicable. Thus, in addition to the analytical metrics, the methodology makes use of bespoke simulations carried out on a proposed design configuration.

Generation of fire scenarios

Returning to the overall formulation of the FIREPROOF methodology in Figure 1, we define a fire scenario as encompassing the probabilities of ignition and escalation. The probability of ignition is primarily based on historical data related to the 14 categories of spaces defined in SOLAS, as these are grouped broadly by fire risk based on contents and usage. The subsequent fire development depends on various parameters, such as fire type and size, geometric and ventilation characteristics together with the effectiveness of suppression systems and actions.

A range of approaches, such as

Figure. 5



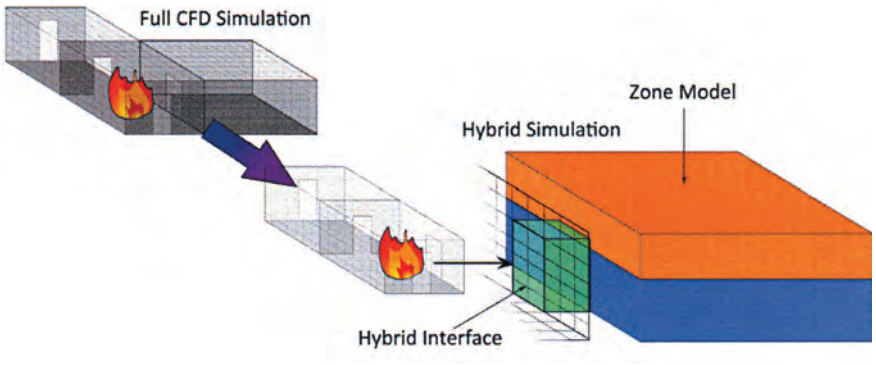


Figure. 6

mathematical fire modelling, fault and event trees and Bayesian networks have been deployed to develop a probabilistic model. These include the reliability and effectiveness of the fire safety systems, incorporated in the methodology using generic fault trees.

The Heat Release Rate (HRR) curve is one of the most important elements in fire safety engineering analysis. It defines the main stages of the fire, which are the *incipient*, the *growth*, the *fully developed* and *decay* stages. Uncertainty in values, such as fuel load, within the space is addressed probabilistically. This results in a probabilistic description of the HRR curve for the space. Figure 3 shows a fire load distribution for a passenger cabin, and the resulting range of HRR curves generated is shown in Figure 4. In addition to the range of numerical values, the two main possibilities of early extinction (highlighted) versus fully developed fires can be seen.

Consequence assessment

The aim of the FIREPROOF method is to encapsulate the fire risk in the design, which includes scenarios of low consequence – minor fires which do not spread – and a much smaller number of potentially serious scenarios. The scenarios of highest risk are examined in greater detail using predictive simulation tools in order to gain deeper insight into their potential consequences. This allows the evaluation of the final term in the risk formulation in Figure 1.

There are two analysis components necessary to evaluate the fire risk to passengers on board a passenger ship. The first is the fire model that predicts the spread of fire products and heat within a ship environment. FIREPROOF adopted the SMARTFIRE CFD fire model tool. The second component, maritimeEXODUS, is an evacuation model that can use the previously generated fire and smoke environment to predict the effect on an evacuating population in both terms of time to evacuate the ship and casualties caused.

The maritimeEXODUS software takes into consideration *people-people, people-fire* and *people-structure* interactions, as shown in Figure 5. The EXODUS software has been written in C++ using Object Orientated techniques and rule-base concepts to control the simulation. Each individual in the simulation is tracked and their movement is determined by a set of heuristics or rules

For the FIREPROOF project a novel hybrid extension to the SMARTFIRE model has been developed whereby a simpler empirical zone model has been interfaced with the CFD model to reduce the necessary runtime for such a model, while maintaining the applicability of the modelling methods used. The relationship between these models is shown in Figure 6. CFD modelling is used for complex geometries and areas beyond the reliable application of zone models and the zone models are applied in areas where the empiricism can be consistently applied.

The ship product model

In the FIREPROOF software framework the Ship Product Model (SPM) acts as a database which can be queried by interface tools to extract data for use in simulation and analysis tools (primarily SmartFIRE and maritimeExodus for the FIREPROOF demonstration, but also including the analytical risk metrics). The aims of the SPM software framework are to demonstrate:

1. The properties and capabilities required of a ship product data model to act as part of the FIREPROOF framework;
2. The storage of a ship model in a Product Data Management (PDM) system, containing the additional information needed to perform fire safety analysis;
3. The successful extraction of this ship and simulation input data and transfer into analysis tools.

These aims required the project team to examine the information types required for the modelling and analysis, determine ways to store this in a demonstrator SPM implementation, develop interface tools and enhance the capabilities of simulation software to accept the SPM outputs. This development has used a mix of existing software (Paramarine, SMARTFIRE and maritimeEXODUS) and new interface tools.

For the FIREPROOF demonstration, the Paramarine software was chosen for the implementation of the SPM. Paramarine is

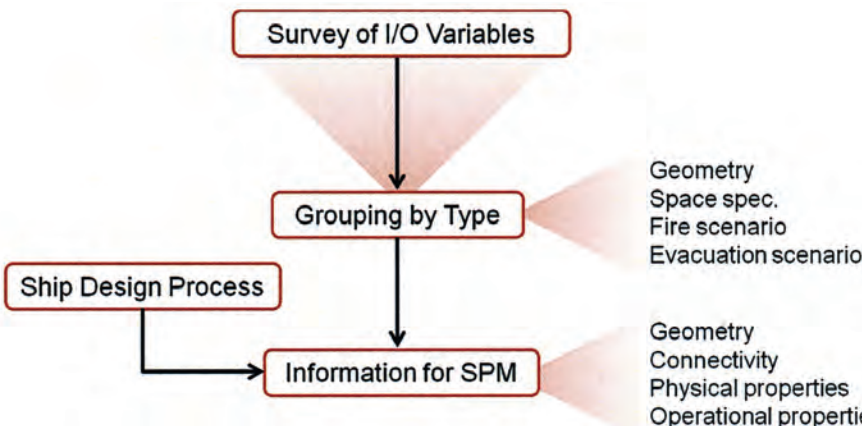


Figure. 7

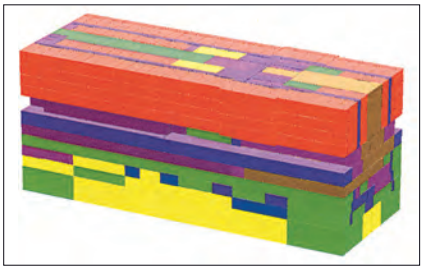


Figure.8

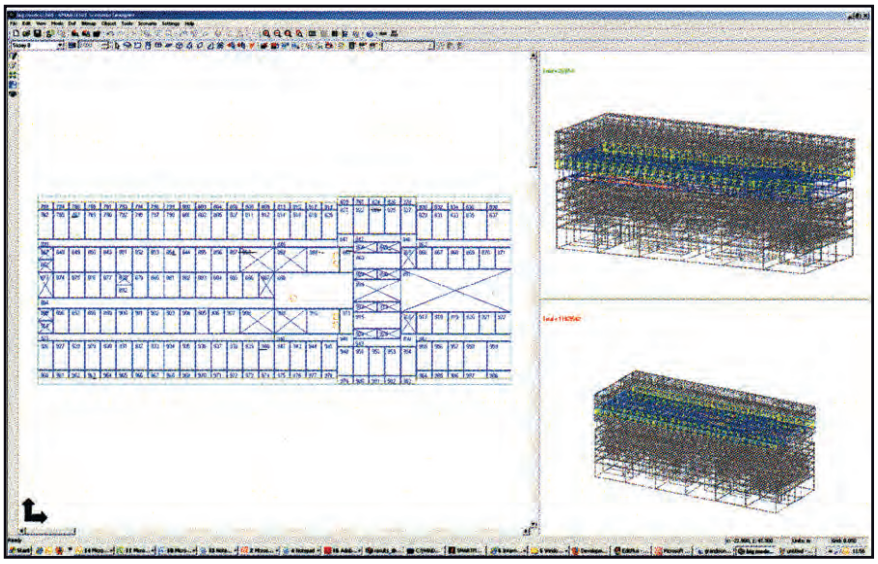


Figure.9

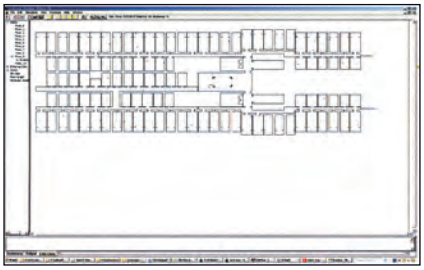
an integrated naval architecture design and analysis software produced by Qinetiq. Its object based description of the ship design, interactivity and extensibility made it the most suitable tool for use in the demonstration.

Product model specifications can be very detailed, allowing their direct implementation in software tools etc. The aim within the FIREPROOF demonstration was not to develop such a detailed specification, but rather to identify the contents, concepts and modelling techniques that would be required of a future more detailed specification. This development was carried out by a process of increasing focus and detail, which also contributed to the division of labour in the demonstration activity. Figure 7 provides a summary of the process of survey and grouping used, including the consideration of the use of the FIREPROOF methodology in the ship design process, which constrains the amount of detail available at a given point in the design development.

Demonstration

The SPM and interface tools were used as part of the modelling process to allow a campaign of simulations to be carried out. Figure 8 shows the Paramarine model, which represented two zones of a generic cruise ship. This model contained 2451 objects, including 1263 spaces and 1117 connectivity items. Figure 9 shows this geometry transferred to SMARTFIRE Scenario Designer, Figure 10 shows it in maritimeEXODUS and Figure 11 is an isometric view of a single deck in SMARTFIRE.

Figure.10



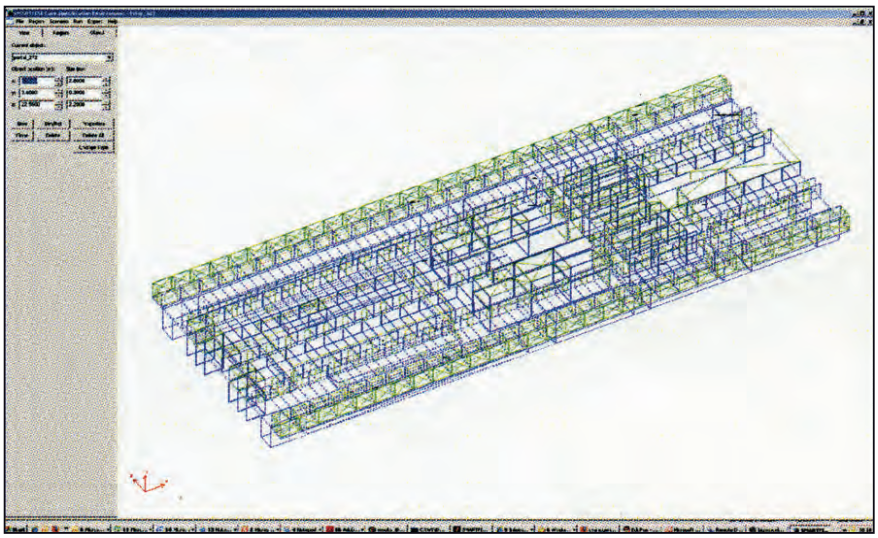


Figure.11

Conclusions

The FIREPROOF project is developing a probabilistic, risk-based approach to fire safety for passenger ships allowing the rational assessment of risk for both conventional and novel designs. This project has seen the development of modelling and analysis tools addressing all aspects of fire, from ignition to spread and consequences for the passengers and crew. To support these analyses, including simulations using a new hybrid CFD / Zone model, the basis specification for a Ship Product Model (SPM) has been developed. Ultimately, the FIREPROOF framework will be submitted to IMO (FP sub-committee) for discussion and further consideration. *NA*

Dr. Richard Pawling, Research Assistant, Design Research Centre, UCL
Dr. Angus Grandison, Senior Research Fellow, Fire Safety Engineering Group, University of Greenwich
Dr. Philipp Lohrmann, Research Scientist, BMT Group
Dr. George Mermiris, Research Associate, Ship Stability Research Centre, University of Strathclyde
Claudia Pereira Dias, Fire Safety Specialist, ISQ, Portugal.

Safeguarding ship evacuation

Understanding how passengers behave in maritme emergencies is vital for the development of robust evacuation procedures. Dr Philipp Lohrmann, and Prof Ed Galea describe the methodology behind full-scale assembly trials –including the largest ever real-life assembly trial on a passenger ship.

An essential component for understanding passenger behaviour is the collection and characterisation of human performance data. However, little data relating to passenger response time or full-scale validation data in maritime environments exists. Although the IMO's evacuation protocol Maritime Safety Committee (MSC) Circ. 1033 and its successor, MSC Circ. 1238 are of great use, it is known in the industry that the existing data is not representative of passenger ships in general.

In a bid to address the IMO Fire Protection Sub Committee's requirement to collect full-scale data for calibration and validation of ship-based evacuation models, as well as proposing and investigating additional benchmark scenarios to be used in certification analysis, the SAFEGUARD project was born. Funded through the European Commission's 7th Framework Programme and the Canadian authorities and bringing together leading industry experts, the findings derived from the SAFEGUARD project will play an integral role in framing the next iteration of international guidelines for ship evacuation analysis.

The first recognised document to specify protocols for the use of ship evacuation models in order to analyse and certify passenger ship design was IMO MSC Circ. 1033 (2002). However, further research indicated that IMO MSC Circ. 1033 was unrepresentative of actual passenger response time and was liable to produce incorrect or misleading conclusions surrounding the suitability of ship design for evacuation.

As part of the European Union FP5 Competitive and Sustainable Growth Programme, a project (led by BMT and featuring the SAFEGUARD partners University of Greenwich and the Offshore Safety and Survival Centre (OSSC)) called "FIRE-EXIT" collected passenger response time data for a passenger ship at sea during 2003 and 2004. This data was then accepted by the IMO and used in the formulation of IMO MSC Circ. 1238, the modified protocols for passenger ship evacuation analysis and certification. However, only a small amount of response time data was produced by FIRE-EXIT and it related to only one type of ship. The data collected was therefore not considered representative of passenger ships as a whole. Furthermore, no assembly time data was gathered – a crucial component of validation data.

Professor Ed Galea, director of fire safety engineering group, University of Greenwich

The SAFEGUARD project was proposed to meet a further requirement by the IMO Fire Protection Committee to measure passenger behaviour during planned assembly trials at sea on three different types of vessels – a ferry with cabins (night passengers), a ferry without cabins (day passengers) and a cruise ship. As well as collecting response times, i.e. the amount of time it takes passengers to begin moving once the alarm has been sounded, SAFEGUARD recognised the importance of collecting assembly time data sets for use as validation data. The latter refers to the length of time it takes for a passenger to reach the designated assembly area.

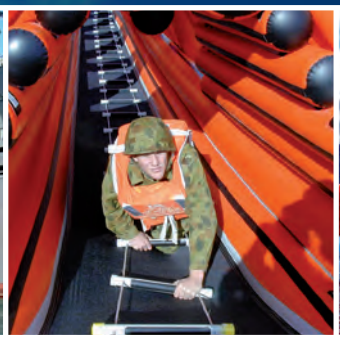
The first vessel where these full-scale trials were to be carried out was the large ro-pax ferry *SuperSpeed 1* (SS1), operated by Color Line which can accommodate approximately 2,000 passengers and crew, as well as over 700 vehicles. The route taken by the vessel during the data collection trials was from Kristiansands in Norway to Hirtshals in Denmark – a trip which takes approximately three hours and 15 minutes. The ship configuration is a mixture of public passenger spaces spread over three decks including: business and traveller class seating areas, large retail and restaurant/catering areas, indoor and outdoor seating areas and general circulation spaces.

Operated by Royal Caribbean Cruise Lines International, *Jewel of the Seas* which has a capacity of 2,500 passengers and a crew of 842 was the second vessel to be used in these real-life trials. The ship contains a variety of spaces spread over 12 passenger decks and features all of the amenities you would expect from a cruise ship of this size such as restaurant and bar areas, theatre, gym and casino etc. The route taken by the vessel during the data collection trial was from Harwich, UK to St. Petersburg in Russia, via Copenhagen, Denmark, a total voyage of nearly seven days. The trial was conducted on the leg of the voyage to Copenhagen. This particular trial is certainly noteworthy as it is the largest real-life assembly trial ever to be conducted on a passenger ship.

The final vessel used was *Olympia Palace*, an overnight ferry operated by Minoan Lines which has a maximum passenger capacity of 2,182 and can carry approximately 600 cars. This vessel

THE MES YOU CAN DEPEND ON




In 1992 Liferaft Systems Australia (LSA) pioneered a simple inclined slide based dry shod Marine Evacuation System (MES) designed to be simple to use and deliver passengers and crew, fast yet safe, directly into large capacity liferafts. Today LSA MES is world renowned for reliability and installed on all types and sizes of passenger & personnel carrying vessels, including conventional ferries, high-speed craft, cruise ships, military vessels and large private yachts.

SAFE, RELIABLE, SIMPLE TO USE, COST EFFECTIVE TO OWN

CERTIFIED TO IMO, SOLAS AND EU; AND APPROVED BY USCG, TRANSPORT CANADA AND DNV.

WWW.LSAMES.COM

LIFERAFT SYSTEMS AUSTRALIA

AUSTRALIA: 5 Sunmont Street, Derwent Park Tasmania 7009 Australia
Phone: +61 3 6273 9277 Fax: +61 3 6273 9281 Email: info@LSAMES.com

EUROPE: Phone: +44 7939 468 224 Fax: +44 2891 240 138 Email: p.rea@LSAMES.com

NORTH AMERICA: Phone: +1 604 780 0016 Fax: +1 604 434 2911 Email: v.prato@LSAMES.com

performs a round trip from Patras to Venice, stopping at Corfu and Igoumenitsa on the way. One leg of the journey takes about 30 hours in total.

Whilst passengers were given prior notice to these trials before boarding the ship, they were unaware as to when exactly they would happen on the journey. In order to gather the data needed, three different data collection approaches were adopted by the SAFEGUARD team. The first was to provide the passengers with a written questionnaire to be completed after the trial had taken place. This would help to collect their own thoughts on certain aspects of the evacuation including how long they took to get to the assembly point.

Secondly, to be able to analyse a passenger's response time, a number of cameras were installed onboard the ships. It is important to note that once an audible alarm is sounded, each passenger's reaction will vary – some may start moving towards the assembly point straight away, whilst others may be asleep in their cabins. This behaviour during the early stage of an evacuation can have a major impact on how the evacuation progresses, therefore it is vital that this stage is properly understood and quantified.

In order to acquire a robust set of validation data for assembly times, SAFEGUARD introduced a third approach developed by the University of Greenwich and OSSC. This methodology utilises infra-red tags which were worn around the neck by each of the passengers. Infra-red beacons were placed in certain areas of the ship so that when a passenger passed a beacon, their tag would be detected and the data recorded. This meant that the passengers' starting location, end location and the time they arrived at their end location (i.e. the assembly station) were recorded. Using this information it was possible to accurately identify the exact length of time it took for passengers to finally get to the assembly points.

This infra-red based tracking system was particularly effective as it was able to accurately record the arrival time of large numbers of individuals as they entered the assembly stations. Furthermore, this system was considered more versatile as it required no external power supplies or cables, therefore transportation and set up was simple.

Five full-scale trials (two on *SS1*, two on *Olympia Palace* and one on the *Jewel of the Seas* were performed with more than 4,300 passengers assembled. Over 100 Gigabytes of video data, as well as over 3,000 questionnaires were collected and evaluated by the SAFEGUARD consortium. It must be noted that response times were indeed collected for all five trials providing a robust set of validation data. However, due to a dysfunctional infra-red beacon in one of the *SS1* trials, the collection of assembly time data was not possible in this particular trial. Furthermore, in each of the two *Olympia Palace* trials, more than 50% of the passengers were already inside the assembly stations and less than half the passengers onboard participated in the trials which meant that the resulting assembly time data sets were not suitable for use as validation data. Despite these challenges, SAFEGUARD has been able to produce two robust validation data sets - one from the second trial on *SS1* and the other from the *Jewel of the Seas*.

A comprehensive data analysis performed by the University of Greenwich produced the following results from the trials. In total, response times from over 2,200 people were collected making it the largest response time data set ever collected on land or sea. In order to collect the response time for a passenger, one must observe the passenger's behaviour following the alarm and record the time that has elapsed to the point when the passenger is deemed to have started purposeful movement to the assembly station. Utilising battery-powered video cameras which were mounted in strategic locations, as well as the ship's own CCTV camera system, the team were able to analyse the resulting data and subsequently provide a Response Time Distribution (RTD) for each of the trials conducted.

Interestingly, the RTD for each of the trials that took place on *SS1* are very similar, despite the fact that each of

Safeguard partners

SAFEGUARD consists of nine project partners based in the UK, France, Canada, Norway and Greece and include:

- **BMT Group Ltd – project management**
- **University of Greenwich, Fire Safety Engineering Group – academic lead/data analysis**
- **Bureau Veritas – development of enhanced certification scenarios**
- **Principia – software simulations**
- **Safety @ Sea Ltd – creation of heel benchmark scenarios**
- **Marine Institute Offshore Safety and Survival Centre – data collection and analysis**
- **Color Line**
- **Royal Caribbean International**
- **Minoan Lines Shipping SA**

Dr Philipp Lohrmann is a research scientist at BMT Group Ltd and the project manager for SAFEGUARD. Professor Ed Galea is director of the Fire Safety Engineering Group at the University of Greenwich and the technical leader of SAFEGUARD

Dr Philipp Lohrmann, research scientist at BMT Group Ltd

the trials was carried out with different people. This would suggest that if the trial were to be repeated again within the same environment with a different group of similar people, we would expect to generate the same RTD – certainly a powerful result. As there were no significant differences between the two RTDs for *SS1*, the results from both days can be combined to form a single data set that is representative of ro-pax ferries without cabins.

When considering the results of the assembly trial that took place during breakfast on *Jewel of the Seas*, it is important to note that a number of passengers were still located in their cabins when the alarm sounded. The passenger response times collected were therefore divided into two main groups – passengers who were in their cabins and those who were in public areas.

Comparing the RTDs for each of these groups shows that the results were quite different, which would suggest that different RTDs should be used to represent passengers in cabins and those in public spaces on cruise ships. Clearly, passengers in cabins take considerably longer to respond than those who are in public areas – they may have been asleep for example.

As *Jewel of the Seas* is a different class of vessel to *SS1*, it was vital to determine if there were any similarities in the resulting RTD. The data showed that the distributions are statistically different – a significant outcome further proving that an RTD generated for one class of vessel cannot necessarily be applied to another type of ship. Furthermore, the data revealed that passengers in public spaces on a cruise ship take considerably longer to respond to the alarm than passengers on a ro-pax vessel.

The implication of this finding is that the current RTD used in IMO MSC Circ. 1238, which is derived from the assembly trials on a ro-pax vessel is not appropriate for all ship classes and different RTDs should be used for cruise and ro-pax vessels. It is further noted that all the trials took place at approximately the same time of day - therefore this is not considered to be a contributory factor in the differences observed.

In addition to determining response and assembly time distributions, SAFEGUARD will also enhance the existing benchmark scenarios for evacuation analysis by introducing new scenarios which will include the effects of heel and trim angles, as well as fire on board a ship. Both of these aspects can have significant consequences on the evacuation process. In particular, any heel of the vessel can reduce the walking speed of the passengers and crew and thus delay the mustering process.

Fire, on the other hand, can block off important escape routes and assembly stations. In spite of their importance, both of these scenarios are currently missing from the international regulations. The development of these new scenarios is based on an in-depth analysis of previous maritime accidents (as performed by Bureau Veritas) and on extensive software simulations, undertaken by Safety at Sea, Principia and the University of Greenwich.

In summary, the SAFEGUARD project will provide three results to the maritime community:

1. A robust set of response time distributions based on real-life passenger trials for more realistic evacuation simulations.
2. Two validation data sets for the calibration and testing of evacuation simulation software.
3. Enhanced benchmark scenarios, taking into account the effects of heel, trim and fire.

These results will shortly be presented to the IMO in the form of information papers. *NA*

Brude launches latest MES

Brude has developed its BHR 225 person liferaft

The latest MES system from Brude has been designed based on the same principles as the Brude BHR 150 system. The system also allows a configuration option of the Brude MES 900, which will consist of two Brude MES chutes and four Brude BHR 225 liferafts. The MES 900 will be able to evacuate 900 passengers in 30 minutes, claims Brude.

The system has been developed in response to demand in the market as passenger vessels get larger and the need for quick and efficient system to be installed onboard. The system operates by two chutes being deployed from the side of the vessel and then the liferafts, which are stored separately, are launched and inflated and then attached to the chutes. A configuration of four BHR 225 liferafts can evacuate 900 passengers.

The Brude BHR 225 has an approved drop height of up to 26m. The system can be launched from a higher but the company recommends that the system would then have to be lowered by a davit system because of the impact on the water surface. *NA*

Schat-Harding pushes safety further

Norwegian-based Schat-Harding has been keeping busy with the development of its FF1200 lifeboat and training hooks

Umoe Schat-Harding Equipment AS (USHE) started a full scale test programme on its FF1200 lifeboat earlier this year. The tests on lifeboats including trim/list have previously been done by the use of model testing only, but the latest DNV OS-E406 requires this to be tested full scale. Along with this Schat-Harding also broke the record for a freefall lifeboat.

A full test programme which started from 29 May to 3 June included tests with trim or list only and combinations thereof. With the use of the crane barge *Uglen*, tests including trim/list up to 17degs and heights up to 40m were conducted.

In August Schat-Harding also set a new freefall lifeboat record with the FF1200. The boat was successfully dropped from a freefall height of 60m. "The FF1200 managed this height in an excellent way," says Geir Arne Veglo, CEO of Umoe Schat-Harding Equipment AS. "The FF1200 entered the water cleanly and made excellent headway."

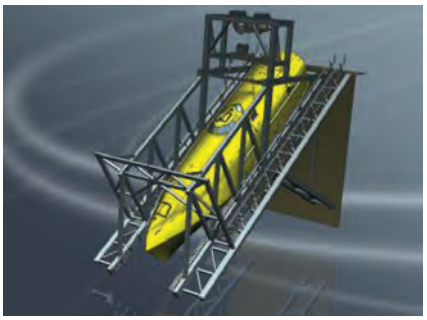
The boat was loaded with seven tonnes to simulate the full capacity of 70x100kg people. As part of the test, the engine was started immediately and was left running for four hours along with different manoeuvring tests.

The FF1200 is the only lifeboat that has completed the full-scale tests set by the new requirements for freefall lifeboats on the Norwegian Continental Shelf, DNV-OS-E406 standard. After the freefall test, the FF1200 is now the highest certified freefall lifeboat, claims Schat-Harding.

The ability to drop safely from greater heights is required as offshore installations get larger. The FF1200 was designed for that purpose and to meet stringent new standards for performance in heavy seas, which will facilitate the evacuation of rigs and installations in the Norwegian North Sea.

"This lifeboat has been well received in the market. Schat-Harding has already secured orders for 47 systems and is now receiving more requests for new projects. We have exciting times ahead as the Norwegian and global offshore markets develop," says Veglo.

The FF1200 boat can carry 70 persons secured in special seats with five point harnesses. After dropping into the water the boat momentum carries it clear of the rig, after which a high power 280hp engine speeds the boat clear of the rig.



FF1200 breaks boundaries with latest testing

The FF1200 successfully passed all tests for full scale trim/list testing for DNV OS-E406.

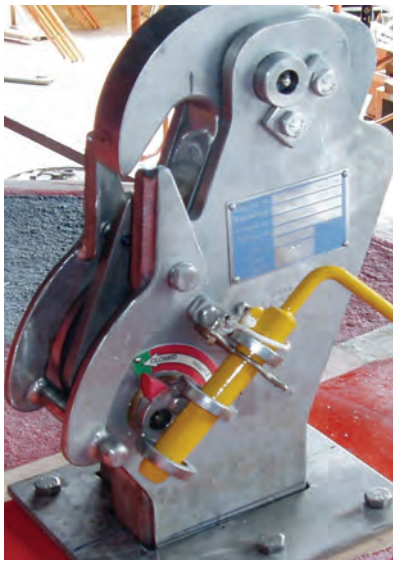
Arild Lokøy, VP engineering in USHE, is thrilled about the performance of the FF1200 and the execution of the tests: "Of course we were nervous about these tests that have never been done before. Our confidence level rose however throughout the week when the boat calmed us all down by its excellent performance. The boat shows superior positive headway even in the most extreme of tests it was challenged to." *NA*

Hooking up

Schat-Harding has completed all compliance tests for the Secondary Safety System (SSS) fitted to its new IMO-complaint SEAcure hooks. Known as a Training Lock, it consists of a heavy yellow metal pin which locks the cam of the hook and prevents accidental release of the hook system. David Bradley, vice president operations for Schat-Harding Service says: "These are not covered by the new IMO regulations, but we know that some parts of the shipping and offshore industries would like to incorporate these SSS into their new hook systems. Seafarers tell us that seeing a thumping great yellow pin securely in place on the hook will make them much more confident during lifeboat drills. That is why Schat-Harding has invested in the development and testing of its unique Training Lock arrangement which can be used during training of boat crew

The Training Lock's advantage over other systems is that if it is inadvertently left in position during a real time evacuation it can easily be removed as there will be no load on the Training Lock mechanism at any point in the launch cycle, unlike some other strop or pin systems."

Schat-Harding's Secondary Safety System passes tests



Quick evacuation from Survitec

UK-based Survitec Group has been adding to its portfolio as the company expands

Survitec group has been broadening its horizons with recently acquired companies such as Zodiac. The latest development from Survitec is the 'remote liferaft launch' feature for the SurvitecZodiac MIS (Medium Inflatable Slide) Escape Slide System. The feature of the SurvitecZodiac system enables a second liferaft to be remotely launched after the double track escape slide has been deployed and its first 150 person liferaft has been automatically inflated. Pulling a painter line on the ship will trigger the second liferaft to be deployed. Previously it was necessary for a crew member to descend into the first liferaft, from where the second could be inflated, notes Survitec.

The development of a remote inflation capability now eliminates the need for any crew to leave the ship ahead of passengers and permits the deployment of a second liferaft as soon as the first has been activated. Survitec expects this to save valuable seconds of vessel evacuation time for passengers and crew.

This particular escape slide system offers high speed evacuation of 731 passengers in 30 minutes, when used with SurvitecZodiac throw over 150 person canopy liferafts. When used with SurvitecZodiac open reversible inflatable 151 person open liferafts, 397 passengers can escape in 17min 40sec, claim the company, an average of one person every 2.67 seconds.

All liferafts used by the latest system are of the SurvitecZodiac Aspirator type and weigh 490kg, allowing overall weight reduction possible when compared to a regular throw over, self righting 150 person liferaft weight of 840kg, says Survitec Group.

GRP containers allow for simple storage of the liferafts and the inflatable slide is folded and rolled around it on tilting deployment cradle, allowing the SurvitecZodiac system to be suitable for a wide range of vessels.

Survitec Group has also announced it has recently received classification approval from Lloyds Register for its increased passenger capacity mass evacuation system (MES), the RFD MarinArk2.

Marin Arc2 system that can handle up to 860 people

This latest development from Survitec offers increased passenger capacity has been driven largely by the industry, through an unprecedented growth in new builds within the cruise and ferry sector.

The company has been working closely with key customers in the cruise industry to bring the new capacity product to the market. Richard McCormick, sales manager for the RFD MarinArk range commented: "This is the latest in a long line of innovations for the RFD MarinArk product range. We can now offer the safe and efficient evacuation of up to 860 passengers, which gives larger passenger vessels more options for system configurations and reduces the need for dated evacuation options such as lifeboats."

All RFD MES undergo the highest level assessment of any LSA - full sea trials in heavy weather of at least Beaufort Sea State 6 winds and 3m significant wave height. *NA*

Remote launch speeds up evacuation times

Predicting the flow

For years hydrodynamicists have been trying to mathematically simulate the three-dimensional (3-D) flow that a vessel experiences underway. Scott C. McClure, president and Donald D. Burris, chief hydrodynamicist, Alan C. McClure Associates explain the challenges

Initially plagued by the high cost of computational power, as well as crude software, it appeared this goal would only be accomplished in the distant future. However, with the recent dramatic advances in high-speed computers, today's computational fluid dynamics (CFD) software packages enable credible and accurate results on a cost-effective scale.

In late 2008, Alan C. McClure Associates, Inc. (ACMA) decided to make a significant investment in computer resources and in the STAR-CCM+ software developed by CD-Adapco. This software allows ACMA to perform CFD analysis that breaks a 3-D volume of space into a number of volumetric cells. Mathematical equations based on the various physics models are then calculated for each of the cells in the volume, with the solution of one cell setting the boundary conditions of adjacent cells. Changes to the solution of the physics equations over time are then calculated to simulate real-world effects.

ACMA recently performed a propulsion study to simulate the hydrodynamic effects that a vessel would experience while underway. The study was done in three phases: a base flow model, momentum source model, and a fully modelled rotating propeller. The base model provided an understanding of the simple flow around the hull and appendages - hull, rudders (steering and flanking), propeller shaft and support struts. The base model was then modified to include a momentum source disk to simulate a four-blade propeller. A final model phase utilised a 3-D model of a rotating five-blade propeller.

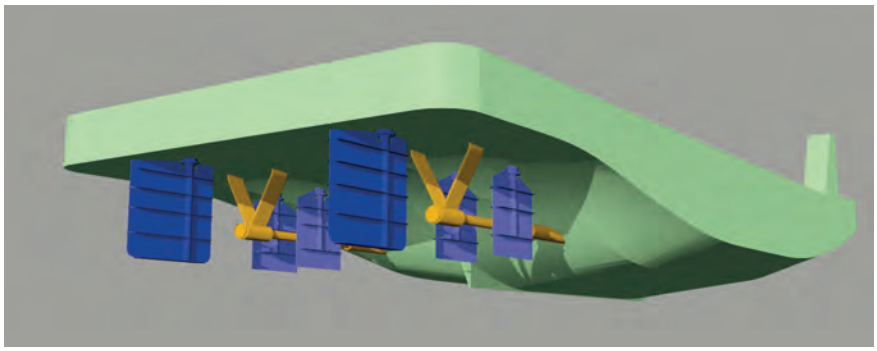


Figure 1. Overall geometry of study vessel

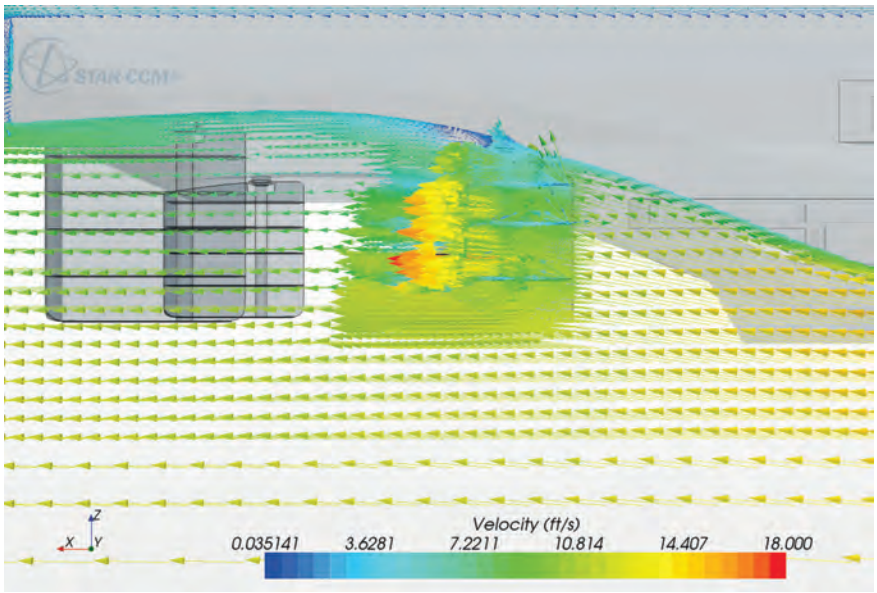
Basic flow model

The basic flow model was completed in order to observe flow phenomena around the hull in the absence of the propeller. This model was invaluable in attempts to identify areas of potential separation of flow from the hull, as well as areas of turbulent flow that would be exaggerated by a propeller. It was observed that there was a significant transverse flow that initiated from the chine into the outboard flanking rudders, imparting flow disturbances into the propeller. This transverse flow would tend to increase the likelihood of the vessel developing vibration issues that could lead to premature steel component and equipment failures, as well as making a noisy, uncomfortable ride for the crew.

Although there was a lot of transverse flow as the water came off the chine, there was not any separation of the flow as it moved up the buttocks longitudinally. Separation of the flow due to steepness of the buttock lines is frequently a concern since owners/naval architects want more power in a compact hull form leading to steeper buttock lines to accommodate propulsion equipment.

As the power requirement goes up, the ability of the propeller to absorb this additional power requirement means that the blade area ratio (BAR) needs to increase and/or the wheel needs to have a

Figure 2. Basic flow model, flow on outboard flanking rudder



NUPAS CADMATIC

6.1 VERSION

Solutions for Marine Networks

XBow model courtesy of Ulstein Group ASA

Structural • Outfitting • Machinery • Piping • Electrical • HVAC

Nupas-Cadmatic's latest software version, V6.1, is an extremely powerful 3D CAD/CAE/CAM system designed specifically for shipbuilding and offshore industries. Nupas-Cadmatic is an innovative solution that simplifies the entire building cycle from the design phase all the way up to the vessel launch. The system saves design time, production time and materials throughout all the ship creation phases: from basic structural design, preliminary design of engine rooms and piping systems to detailed engineering and production information.

Nupas-Cadmatic is a concurrent engineering tool for ship hull, piping, outfitting, HVAC, cable tray and electrical engineering. Powerful 3D modeling in conjunction with advanced production modules significantly improve the quality of production and greatly shorten construction times.

Nupas-Cadmatic is represented globally by a network of 21 sales and support partners. Our unified goal is to keep our more than 400 Nupas-Cadmatic clients one step ahead of the competition in continuously changing market conditions.

Some V6.1 Highlights

- New Ribbon User Interface
- High Level Topology
- Copy Manager
- Improved Hull Viewer
- Enhanced support for Unicode
- Renewed HVAC routing
- 3D spaces and compartments
- Improved Shell Views
- New Diagram – 3D Model Integration
- Electrical Cable Router
- eBrowser model comparison
- eBrowser location views
- Topological Seams & Butts
- Enhanced hole management

Numeriek Centrum Groningen B.V.
Osloweg 110, 9723 BX, Groningen, The Netherlands
tel: +31 50 57 53 980, email: sales@ncg.nl

Cadmatic Oy
Itäinen Rantakatu 72, 20810 Turku, Finland
tel: +358 2 412 411, email: sales@cadmatic.com

www.nupas-cadmatic.com

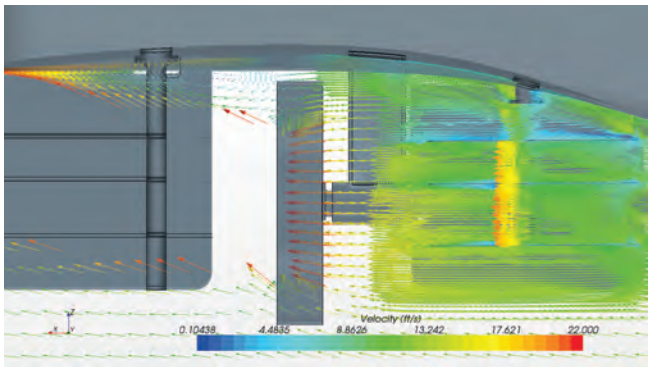


Figure 3. Momentum source propeller model

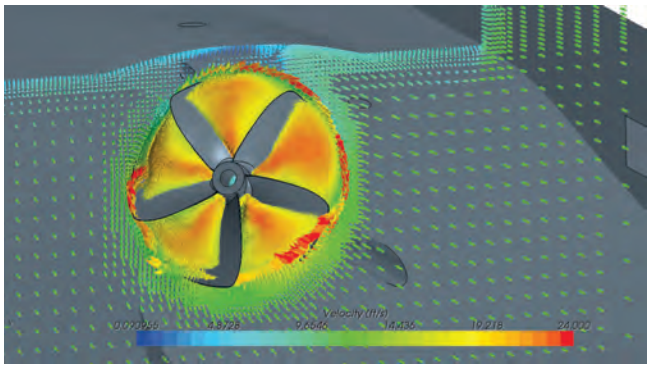


Figure 4. Rotating propeller model

larger diameter. As the propeller diameter increases, the clearance between the propeller tips and the hull, as well as the submergence of the wheel often suffer. These trade-off's and decisions are always present when the hull characteristics remain constant and the need for more power is desired.

The momentum source disk model

The next phase of the modelling used a momentum source to simulate a rotating propeller. The momentum source is based on fan laws, and thus the performance curve of a four-blade propeller was input to the model. As flow moves into the vicinity of the momentum source, the flow is accelerated as if it were being "sucked" and "pushed" by rotating blades. The four blade propeller was used as it is a common selection for vessels of the type and size under consideration. Although we noted that the 90degs blade orientation might create problematic interactions with the flanking rudder and shaft struts, ACMA felt that the large BAR of the wheel might mitigate those issues.

Based on real-time monitoring of the analysis, 130 seconds of simulation time was found sufficient to quantify the steady state flow phenomena. A time-step of 0.05 seconds was used for the simulation, based on the blade passing frequency. Based on the physics models used and the density of the volume mesh, each time-step represented roughly 64 million simultaneous equations being solved.

The resulting flow field revealed flow lines at the top of the propeller moving much slower than the flow velocity at the bottom of the propeller. This type of asymmetrical loading tends to accentuate any vibration problems such as those already noted due to the large transverse flow. What was also noted was that a force coupling developed with the impact loads on the hull at the blade passing frequency. This coupling was due in part to the proximity of the propeller blades to the hull.

The five-blade rotating propeller model

A number of options to mitigate the adverse effects that were seen with the four-blade propeller were proposed, including a five blade propeller. This model also stepped to a further level of complexity by including a 3-D rotating model of the five blade propeller. In this simulation, the solid representing the propeller was rotated in a fluid domain embedded within the larger fluid domain. The software mapped the physics effects between the two domains such that the flow was accelerated into the propeller and thrust aft.

The results were promising. The flow irregularities were somewhat tempered owing to the increased passing frequency of the blades. The change in propeller geometry lead to de-coupling of the impulse loading on the hull observed in the four blade analysis. Although it did not result in the complete elimination of potential flow-induced vibration sources, it was a step in the right direction.

In closing, the technology needed for accurate simulation of complex hydrodynamics through CFD software has come of age. The computational power and software is affordable for even small consulting firms. CFD can be used to give real-time recommendations to vessel owners and designers facing difficult flow related issues.

Major changes in a vessel design, such as the propeller, can be easily simulated with the results available in a few days. This has already shown itself to be a big cost saver to the owner and/or shipyard since it is cheaper to run software than to replace equipment in a trial and error process. In this case, if we had run the analysis before the client purchased the problematic four blade propeller, the cost savings would have been realised in the purchase of only the five blade propellers, and the elimination of the associated down time required to dry-dock the vessel for propeller replacement.

In addition to this exercise, ACMA has had very good experiences in utilising the software as a virtual tow tank, in which the impact of physical vessel modifications, such as hull form, and operational changes, such as trim, can be quickly modelled to estimate impact on powering requirements and fuel efficiency. ACMA has found a good correlation between the CFD-predicted values and real-world performance through direct in-house comparisons. CFD also allows for full scale simulation, eliminating issues of scaling that can be difficult to capture and handle in traditional model testing. ACMA expects CFD analysis to continue to expand its role as a key engineering tool in the future.

Authors' Biographies

Scott McClure, P.E., President of Alan C. McClure Associates (ACMA), has 29 years of experience in the offshore and marine industry. Donald Burris, P.E., Chief Hydrodynamicist at ACMA, has 10 years of experience in the offshore and marine industry. *NA*

Simulation helps marine engineers navigate challenges

By leveraging ANSYS software to design marine structures in a risk-free virtual environment, engineers can introduce innovations faster and with greater confidence. Spiro J. Pahos, technical services engineer II, ANSYS UK explains further

Today, the international marine industry faces unprecedented challenges. Energy costs are rising, as are concerns about emissions and other environmental impacts. Fluctuating demand for new ships requires engineers to operate with a high degree of responsiveness, cutting the cycle time needed to produce new vessel designs. Extreme weather, hazardous cargoes and other challenging operating conditions present designers with the need to continuously innovate and deliver higher levels of performance. And, like every other industry, the global marine industry faces ongoing pressures to cut product costs, while maintaining ever-higher quality standards.

Meanwhile, staff levels are decreasing as shipbuilders aim to cut personnel costs in order to remain competitive. Many engineering teams are expected to produce the same output, with fewer resources.

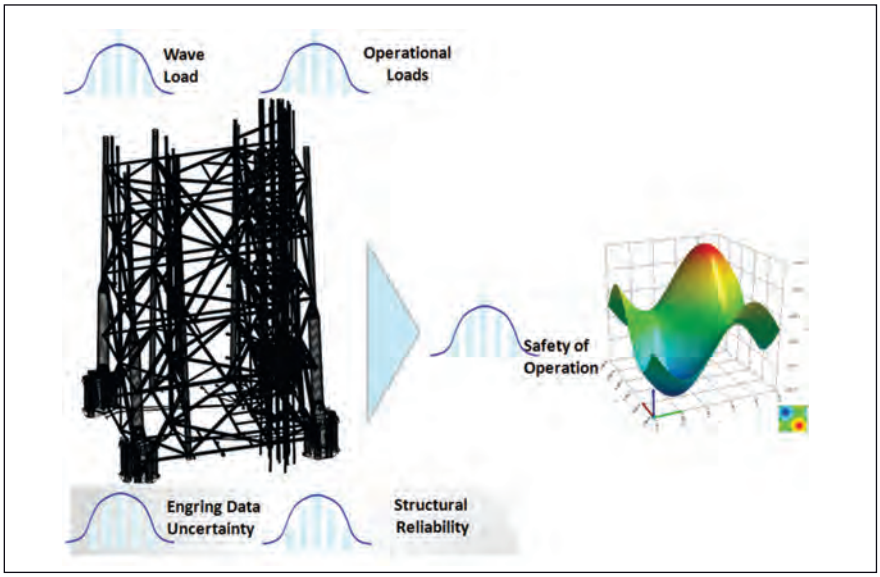
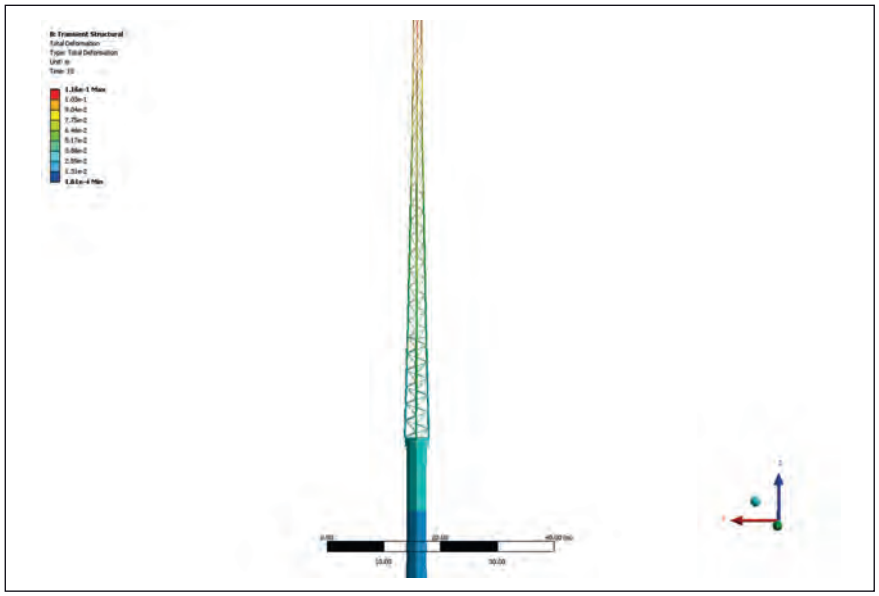


Figure 1: ANSYS Design-Xplorer helps naval architects to weigh a number of design variables before arriving at an optimal solution

How can naval architects overcome these challenges? One answer lies in leveraging the power of engineering simulation to design new vessels and features in a risk-free, cost-effective virtual environment.

Figure 2: Post-processing deformation on a jacket pile



By building ships and components in a simulated environment, engineers can quickly arrive at groundbreaking innovations, without investing time and money in physical prototypes. Engineers can subject their virtual designs to extreme temperatures, waves, wind loading, cargo weights and other real-world conditions in order to assess their response. Not only can designers verify and introduce naval innovations faster, but they can predict confidently how their designs will perform under actual operating conditions. Engineering resources are amplified, as teams rely on powerful software to automate and streamline many routine design tasks.

ANSYS software offers the robust capabilities to help engineers conduct

design analyses and optimisation studies that reflect the most demanding environments. Solutions from ANSYS help naval architects design new hulls, appendages, sails, propellers, platforms, cargo spaces and other marine components.

Marine engineers face special challenges as their designs must withstand a range of physical forces, dynamic loads and transient conditions. ANSYS offers powerful capabilities to address these challenges and is continually adding, refining and improving its design capabilities. Following is a discussion of some of the recent innovations at ANSYS software that will help naval architects overcome their growing design challenges.

Improved support for large simulations

Geometrically modelling the complexities of a ship is obviously a numerically large, complex task. When the dynamics of wind, waves and temperature are added, these virtual models grow even larger. Improved performance for large models is now a primary focus of ANSYS, in order to reduce product development cycle times and launch design innovations faster than ever.

Naval architects rely on high-performance computing (HPC) environments to conduct their complex simulations, and ANSYS software is designed to deliver maximum speed and efficiency across multiple computing processors and technology clusters. Several enhancements have taken place to improve ANSYS software's capabilities for geometry import, modelling and data transfer between ANSYS DesignModeller and other applications in ANSYS Workbench, the integrated framework upon which ANSYS simulation technology is built.

With bi-directional CAD connectivity, highly automated meshing algorithms, project-level update capabilities and built-in optimisation tools, ANSYS software supports high-fidelity simulations at both the component and system levels. Naval architects can study transient problems, such as a series of wave cases, via tree hierarchies. By sharing data seamlessly among different systems, naval architects can carry out a series of different analyses — such as static structural studies, modal analysis and random vibration — in a single workflow that maximises speed and efficiency.

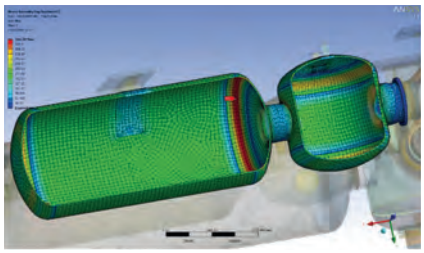


Figure 3: Stress intensity results of the decompression chamber (courtesy of Subsea 7)

ANSYS customers have leveraged HPC environments and enhanced ANSYS technologies to achieve significant reductions in their simulation runtimes, particularly when running distributed tasks across multiple processors. Fluid-structure interaction problems that rely on computational fluid dynamics (CFD) studies are now easier to set up, solve and post-process with ANSYS CFX and Fluent software. In Workbench, popular CFD solution methods share a common workflow, where interaction with other products is enabled through controlled workflows. This reduces the learning curve for naval architects who want to use both CFD technology and structural engineering solutions. Fluid-structure interactions can be modelled and verified faster than ever.

Customised capabilities for marine applications

While many recent technology enhancements benefit all users, ANSYS is also focused on improving its capabilities that are targeted specifically at marine applications, including its ANSYS Aqwa and ANSYS Asas

Both Aqwa and Asas have seen major changes in the last few years, while even more capabilities will be added in the future. For instance, a wealth of accumulated knowledge from customer implementations of Asas technology has now been completely incorporated into ANSYS Workbench. Enhancements include more user-friendly modelling, the ability to import geometries from third-party CAD packages, in-place analysis with easy input parameterisation, efficient load definition, the ability to account for ebb and tide, and the option to choose from as many as seven wave theories. New progressive workflows standardise and simplify the overall modelling experience.

ANSYS Design-Xplorer also offers improved capabilities for conducting optimisation studies. A new Direct Optimisation System gathers information via data links to other systems or components that contain design-point data — reducing the time needed for optimisation, without altering the original geometry. This new system supports earlier decision-making, decreasing overall development time and eliminating a lengthy trial-and-error design cycle. Engineers can easily visualise the trade-offs among design variables and make choices that support their desired result by answering a series of what-if questions. Figure 1 demonstrates how a number of design variables can be considered when building a jacket structure with Design-Xplorer.

ANSYS Design Assessment is an analysis system in Workbench that now includes the company's code-checking software for the marine industry, ANSYS Beamcheck and ANSYS Fatjack. Design Assessment supports code checking, fatigue analysis and post-processing of user-defined results. Post-processing speed has been significantly improved, decreasing from minutes to seconds. Results can now be obtained and presented in a single result object, based on multiple intervals, wave cases or spectra.

ANSYS designed its Splinter technology to support simulation of single soil piles or pile groups, including group interaction effects via the soil medium. New built-in macros enable soil-pile interaction analysis via the use of command objects. Post-processing results allow for more efficient handling of large models, straightforward set-up, and intuitive data management, while Asas commands remain in the code to facilitate the transition between Asas and Workbench. Figure 2 shows a soil-pile interaction model post-processed in Mechanical, the same tools as for every other analysis are now available.

The recent addition of the intuitive Python programming language enables marine engineers to create user-defined graphical user interfaces (GUIs) in Workbench that support their pre- and post-processing work. This technology can be accessed via ANSYS Customisation Toolkit (ACT), which supports a customised interface for interactive input, definition of restrictions and constraints, rapid validity checks, and decision-making support at the application level. Full parametric analyses, GUI customisation and the definition of custom loads specific to the marine industry can now be supported in the taskbar.

For marine structural studies, ANSYS Mechanical now includes built-in rotordynamics macros that reflect a more sophisticated way to study rotating machinery on platforms and ships. The process for setting up analyses and applying loads has been streamlined and shortened. A graphical user interface (GUI) can now be used to define bearing properties such as stiffness and damping, define the rotation plane and apply any loads. When used with Design-Modeller's parameterisation tools, in conjunction with Design-Xplorer, ANSYS can shave time off the development process.

Figure 3 depicts the FE results of a decompression chamber in a 24 man saturation diving system onboard a dive support vessel. The design had to meet certain stress criteria from a pressure vessel design code.

Charting a confident course

No matter the engineering challenge, simulation software from ANSYS can help deliver the early answers and high level of confidence that marine engineers need to ensure the ultimate integrity of the shipbuilding process. Few product systems face the rigors of marine vessels, but ANSYS can model waves, winds, temperatures and cargo loads with a high level of accuracy and fidelity, says the company.

ANSYS is committed to making continuous improvements that reflect new engineering challenges. Whatever the future brings, ANSYS can help naval architects and marine engineers chart a confident course towards better and more efficient designs. *NA*

ShipConstructor gets in sync

ShipConstructor Software Inc (SSI) has developed its latest WorkShare Design product enhancing the ShipConstructor design suite

ShipConstructor Software Inc has expanded the capabilities of its Autodesk based shipbuilding software, opening up new possibilities for parallel design and engineering amongst distributed teams.

WorkShare Design allows users of ShipConstructor's CAD/CAM application to capture, reuse, change and then sync back portions of a design along with the associated production documentation. This latest functionality has many practical applications including increased capabilities when working with sister ships, design tests, recovery from errors and for general reuse of design data to increase efficiency.

"WorkShare Design is built on a technology that allows what we call 'intelligent capturing,'" says Denis Morais, chief technology officer for SSI. "The capturing of design data is intelligent in that it involves more than just copying and pasting of simple geometry; all of the complex relationships within a design are preserved as well. This intelligence is further displayed after changes are made on the copied portion of the design since these changes can later be synced back, automatically updating the original project."

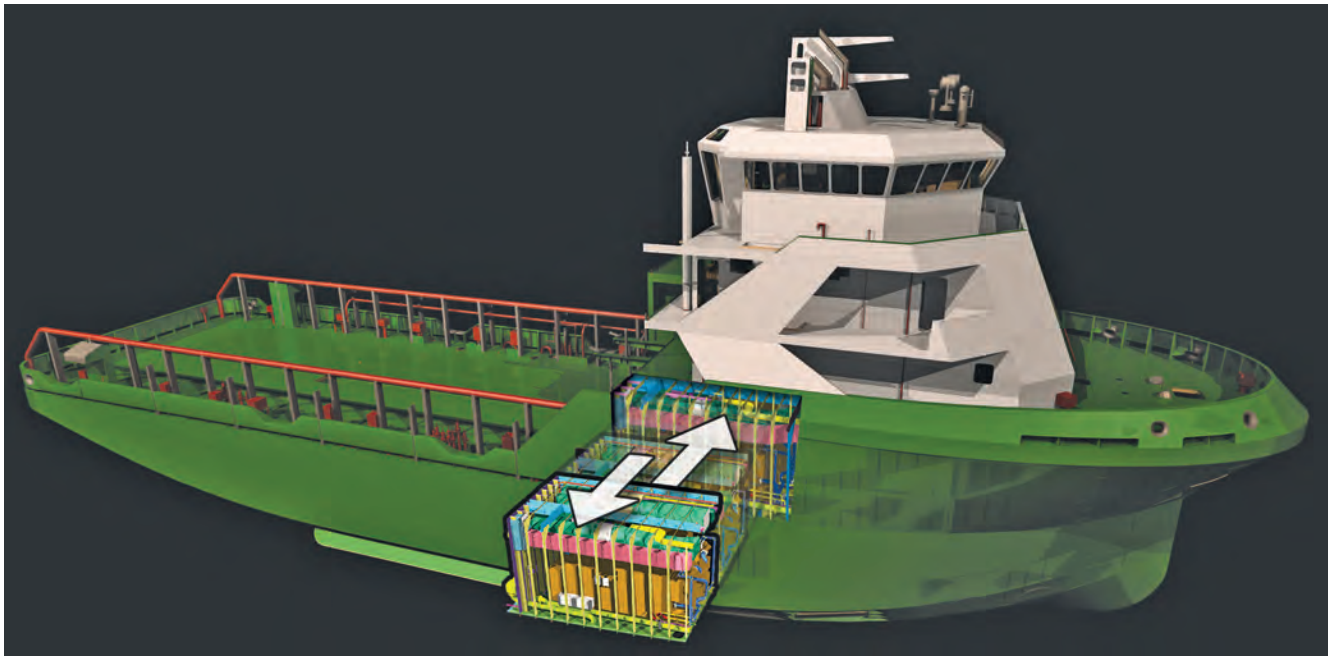
Engineers can select and then reuse various portions of a design complete with production documentation such as assembly drawings, arrangement drawings and isometrics while preserving all the associated linkages to other aspects of the ShipConstructor Marine Information Model (MIM) including stock and catalogue information. Any modifications to the copies can then be synced back into the original design with all the complex relationships intelligently updated.

The ability to reuse design data in this way addresses a variety of cost-cutting requirements identified by shipbuilders. An advantage of this is when modelling sister ships because these also require parallel engineering on copied design data. In a sister ship scenario, engineering teams have to start modelling the second ship in a series even before the work on the first ship has been completed. The WorkShare Design product reduces engineering time by allowing the engineers to copy and reuse the design of the first ship for use on the sister vessel. As the design advances, more of the first vessel will be modelled and other changes may be made to the original design. The engineering team for the second vessel can then chose to incorporate those changes into the design of the sister ship.

Another efficiency of WorkShare Design is the ability to reuse design data when modelling blocks (or any smaller units) that repeat. The product also provides a method for recovering from human errors because duplicate copies of sections of a project can be created and then synced back if later needed.

A further key point to note is that these latest capabilities of the software continue to keep making complex engineering software as intuitive as possible, says ShipConstructor. There is no requirement for multiple different programmes with varying interfaces, and data is not stored in multiple locations. A familiar central interface is used and all design information is captured and collected into a single package. *NA*

WorkShare Design expands on the design reuse capabilities

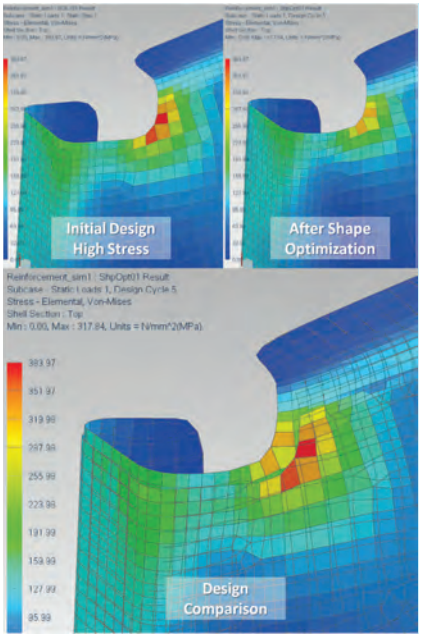


NX 8.5 delivers more to the market

Siemens launches its latest NX software with development aimed at meeting its customers' needs

NX software, the company's fully integrated computer-aided design, manufacturing and engineering analysis (CAD/CAM/CAE) solution and will be able to make smarter decisions throughout design, simulation and manufacturing for increased flexibility and productivity, says Siemens. The latest version, NX 8.5, includes extensive customer-driven enhancements and new capabilities that will provide increased flexibility and productivity across product engineering and manufacturing to help reduce time to market. NX 8.5 builds on Siemens PLM Software's HD-PLM vision, which was established to help companies make smarter decisions more efficiently and with a higher level of confidence.

"The extensive customer-driven enhancements and new capabilities in NX 8.5 will help our customers further reduce time to market and facilitate smarter decisions that result in better products," said Jim Rusk, senior vice president, Product Engineering Software, Siemens PLM Software. "By intelligently integrating information and providing customers with a high definition user experience, we are reinforcing our commitment to HD-PLM. NX 8.5 also continues our focus on maximising customers' return on their PLM investment. By conducting extensive testing to ensure version compatibility between each new release, we can deliver a future-proof architecture our customers will never outgrow."



NX CAE 8.5 Shape Optimisation reduce stress concentrations using NX Shape Optimisation to suggest detailed improvements to an existing design

NX 8.5 will have a wide range of new and enhanced design functionality, to help improve efficiency and reduce design time. Streamlined workflows and an enhanced user experience help improve productivity, minimise input, and reduce the effort required to accomplish design tasks.

In addition, new design commands help shorten design cycle times by up to 30%. For example the new Emboss Body command will require fewer steps when combining a region of faces from another intersecting solid or sheet body. NX 8.5 also includes other capabilities for feature modelling, sheet metal design, freeform modelling, validation checking and drafting.

NX 8.5 includes simulation enhancements that will help development teams more efficiently engineer products. Optimisation tools such as NX Shape Optimisation will give detailed improvements to an existing design to reduce stress concentrations. NX 8.5 also includes improvements in simulation modelling, structural, thermal, flow, motion and multi-physics analyses to help prepare more accurate analysis models faster, and speed solution time by as much as 25%, claim Siemens.

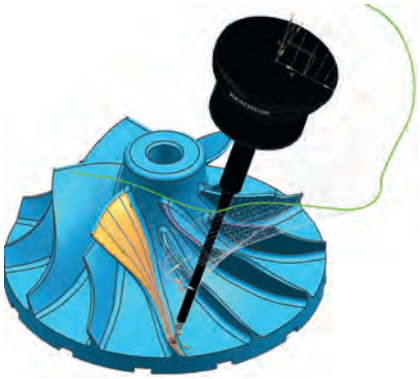
NX 8.5 for simulation also includes the release of a new version of NX Nastran software, a FEA solver for computational performance, accuracy, reliability and scalability. NX Nastran 8.5, further increases the types of solutions that can be performed, along with a number of computational performance and engineering workflow improvements, such as new edge-to-edge glue contact and glue connections.

NX 8.5 includes the full release of Volume Based 2.5D Milling. Customers working with the initial introduction of this solids-based approach to the programming of prismatic shaped parts have reported excellent ease of use and faster programming times. Also new are functions to support and automate multi-part and multi-stage machining. These new NX 8.5 CAM functions are particularly relevant to the type of parts commonly found in the machinery industry.

The highly automated quality inspection programming capability offered by NX CMM Inspection Programming has been added to NX 8.5 with measurement results analysis and display inside of NX. NX CMM extends the value of NX as a single, wide-ranging solution for manufacturing engineering.

In addition, new cutting tool library and CAM data management capabilities support faster NC programming and make it easier to access and re-use resource information, and ensure the use of the correct data from NC programming through to machining. *NA*

With NX 8.5 CMM Inspection Programming you can quickly create CMM programmes and visualise the measurement results directly inside NX



MasterShip joins forces with SARC

The Netherlands-based MasterShip and SARC have decided to team up on future projects, improving the efficiency of the design process

The partnership between the companies will bring the two ends of the design and construction process together. In a competitive environment, closing existing gaps and eliminating overlaps in the shipbuilding process are getting increasingly important, says MasterShip.

SARC (design and stability software) and MasterShip (modelling and production software) will be cooperating closely, which will lead to a better workflow from concept design to construction modelling, production and loading evaluation.

Jacques Hoffmans, a spokesman for MasterShip, says: "Our cooperation is an opportunity for one stop buying for our clients of two best-in-class and fully integrated software tools for design and work preparation, so avoiding gaps and overlaps." Herbert Koelman from SARC added: "This partnership is also streamlining our international exposure and support."

Added to this is the launch of MasterShip's Workshop assistant, which will bring users a 3D model of the designs into the workshop. After a two-year innovation programme, MasterShip has developed its latest software and hardware solution.

The Workshop Assistant is a touch-screen table that brings the 3D ship model to the shop floor. The first tests done by two shipyards have shown good results, says MasterShip. It noted that building information was much easier to understand and provided welding, fitting and assembly information. MasterShip has also said that engineering cost decreased as the expense of the creation of production drawings went down.

Furthermore, MasterShip has also introduced its template oriented modelling (TOM) which, will give users an easy method in which to create parts using predefined ship construction templates. Parts made with TOM are updated when there are changes in the 3D lines plan or parameters. 3D construction models and 2D construction, class and workshop drawings can be created simultaneously, efficiently and faster.

TOM allows the creation of construction even when the exact location of the shell seams is not known. Users first create the part and, when the exact location is known, they can add the necessary welding hole and other details. This allows for more accurate weight and centre of gravity (COG) estimates early on in the process, says the company.

TOM is implemented in both MasterShip's Modelling Software and Production Software. This guarantees a standard work method and an easy link to the production phase resulting in time saving and better control of the process.

SARC updates

SARC has presented the release of an interface of its Fairway hull design software. Fairway allows full and direct control over actual hull lines by simple operations. Thereby, hull design per computer is made as flexible and versatile as drafting on paper. The interface is developed to improve the user friendliness of Fairway. Different types of software can now make use of the same basic geometry model of the vessel, which will reduce double input, data conversions, version conflicts, and so on.

Beside the Fairway interface, SARC has also launched its latest method to define the subdivision of a vessel, named Newlay.

Newlay allows bulkheads to generate defined compartments and vice versa. Either of these two types of models can be most suitable, depending on preferences and project composition. This development includes an open interface for communication with different types of dedicated software such as MasterShip.

This means that different types of software can now make use of the same basic geometry model of the vessel, which will reduce double input, data conversions and version conflicts, which will save the designer time. *NA*

NAPA thinks outside the box

Finnish-based NAPA introduces its Box Transformation for hull definition and manipulation of surface areas

Hull form outline makes for a natural first step towards eco-efficient design. However, it is very difficult to find the optimal hull form by any manual method as it would take many hours work for the designer to run through every variable manually. Hence, the increasing demand for optimal hull forms to be developed using automated hull form modification and optimisation algorithms.

NAPA's latest edition to its toolbox will give the user a more efficient method for transforming hull forms, without affecting the fairness of the hull design. Traditionally, the hull line is developed by controlling the points of the definition curves of the hull surface and can take several hours to obtain a faired hull form even though the amount of required modifications can be small.

NAPA's latest function, called Box Transformation handles not the points on the curves, but the hull surface itself by controlling the control indices of the transformation box. The time needed for modifying a hull form is dramatically decreased as it will only take minutes to obtain a transformed surface faired enough for the use, says NAPA.

The user can define a transformation box that covers a part of the hull surface and modifies the box by moving the control points (by stretching or skewing, for instance). As a result, the part of the

original hull surface that was initially inside the box is deformed. The parts that were originally outside the box are kept as they were and the continuity is maintained at the box boundary region.

NAPA's Box Transformation Manager Application (BTMA), based on the box transformation function, gives the user experience in hull form development. It provides a way of working in the hull form developing environment. NAPA highlights that the Manager is intuitive and easy-to-use providing a convenient way of creating and editing transformation boxes and comparing the original and transformed hull surfaces. The user is able to produce a transformed hull form the fairness of which is kept as equivalent as that of the original's in a short amount of time.

NAPA Release 2012.1 includes the first implementation of this tool. In this first phase, the method can only be applied to surfaces with Non-uniform rational basis spline (NURBS) representation. Prepared NAPA patch surfaces, which include a NURBS representation can be transformed, but the curve network that was used in the preparation cannot yet be modified. The modification of the curves and other objects will be handled in future releases.

In addition, ClassNK and NAPA have announced that they will collaborate to provide a comprehensive solution for Ship Energy Efficiency Management Plans (SEEMP) for ship operators.

By sharing their expertise, this co-operation will provide a service for ship owners, operators and shipbuilders to aide them in reducing energy consumption and emissions, fuel costs and find an effective solution for SEEMP, for which regulation will come into force on 1 January 2013.

In order to ensure that the collaborative SEEMP solution will be both effective and practical for use on actual vessels, ClassNK and NAPA are working closely with Japanese shipbuilder, Imabari Shipbuilding Co. Ltd.

A trial version of the new solution is expected to be completed within the year, and upon completion it will undergo extensive real world testing on vessels owned and operated by an Imabari Group shipping company. Feedback from this verification testing will be used to further develop and refine the system prior to final release. Imabari Shipbuilding will also make use of the system and the results from its verification tests to further improve the performance of new vessels built at its shipyards.

The SEEMP solution from ClassNK and NAPA will combine modules to optimise trim, route and speed optimisation and weather routing with an analytics service to offer operational efficiency and decision support. The system will allow owners and operators to respond quickly and adapt operations in real-time to capitalise on latent efficiencies within operations in order to increase eco-efficiency and reduce fuel consumption as a solution for SEEMP, says NAPA. *NA*

SHIPBUILDING ICCAS Busan • 2013

International Conference on Computer Applications in Shipbuilding

24-26 September 2013 | Busan | South Korea

The 16th International Conference on Computer Applications in Shipbuilding (ICCAS) will review operational experience from existing computer applications in the design and build of ships and offshore structures and will cover a full range of topics including; CAD, CAM, integrated systems, knowledge management, simulation and virtual reality applications, etc.
It will also examine the advances in Information Technology which have contributed to increased productivity in both shipbuilding and maritime operations; including increasing co-operative working between shipyards, marine equipment and system manufacturers, engineering partners and shipping companies.
These conferences attract a large international audience and provide a excellent forum for both those developing and using computer applications in shipbuilding.

Call for Papers

Please send us an abstract of about 200 words before the 24th of February in order to begin the reviewing process. The successful papers will be related to computer applications in shipbuilding and will focus on the following subjects:

- EARLY DESIGN
  Concept design, tendering, initial design, general arrangement, cost & work estimation, hull form, hydrodynamic analysis & basic structural design, risk based design
- DETAILED AND PRODUCTION DESIGN
  Structure, machinery, hull and outfitting
- PARTS MANUFACTURING & ASSEMBLY
  Prefabrication, shop automation, robotics, assembly & accuracy control
- MATERIAL MANAGEMENT
  Material control, supply chain management, logistics & e-solutions
- MANAGEMENT OF SHIPBUILDING PROJECTS
  Planning, work-flow analysis, PDM & ERP applications Management of co-operative working between different actors in shipbuilding projects, e.g. shipyards and equipment and systems manufacturers
- COMMISSIONING, INSPECTION AND MAINTENANCE
  Life-cycle maintenance, lifecycle cost management, environmental cost management, parts & systems reliability, inspection standards & risk management inspection standards, risk management & security
- INNOVATION, INNOVATION MANAGEMENT AND INNOVATION IMPACT ASSESSMENT
  New materials & eco design
- SKILLS MANAGEMENT, KNOWLEDGE TRANSFER AND OTHER HUMAN RESOURCE ISSUES

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

Abstract submission deadline: 24th February 2013

Register an Interest | Send an abstract | Interested in Sponsorship?

Contact us: conference@rina.org.uk or Tel: +44(0)20 7201 2401

or visit the website

www.rina.org.uk/ICCAS2013

APL's statement of intent

In ordering ships optimised for operations at between 14 and 19knots APL has made the bold statement that container ships will never again sail at higher speeds. The result is an order for 10 ships of 13,800TEU by APL at Hyundai Heavy Industries (HHI) using a concept borrowed from DNV

Owners are looking to optimise designs for ultra large container ships (ULCS) by bringing together shipyards, class societies and designers from their own companies.

Optimising ships for a particular trade is not new, Maersk made the move when it set about designing its own ULCS, the Triple E class, but for APL and DNV the process has worked a little differently.

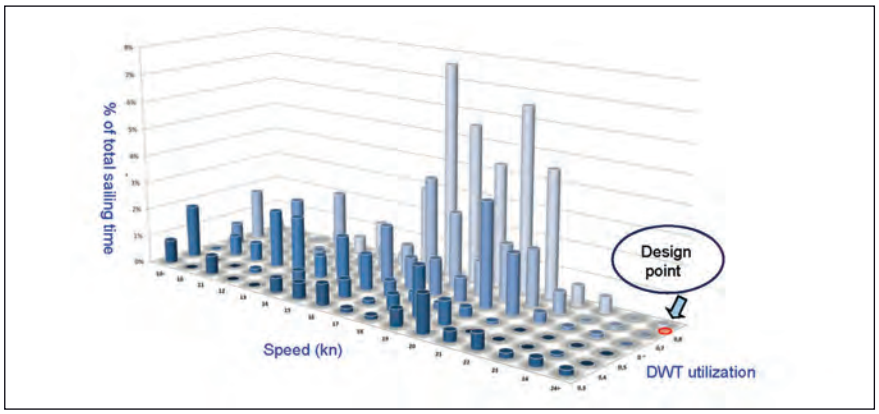
According to Tor Svenssen COO of DNV the initial design of APL's newly ordered ships was inspired by his classification society's concept ship, Quantum. This concept vessel included a number of radical ideas such as low ballast and a low block coefficient, of 0.57.

Quantum was expected to trade between Asia and South America, however, and APL has optimised their vessel for the Europe/Asia trades. That said the major element, but by no means the only element, in making the vessels significantly more fuel efficient than traditional designs has been the slowing down of the vessel.

Container ships were designed to operate at around 25knots prior to the great economic calamity that befell global trade in 2008. Before the great crash ships were optimised at a single design point, the 25knot speed, hull lines, draft and block coefficients were optimised for these speeds.

In the post economic crash era vessels have slowed down, mainly because the cost of fuel has increased dramatically, but also because in the boom years owners ordered vessels for trades that they expected to continue growing at around 15%; post the economic calamity they were being delivered into contracting trades and the new ships no longer had any cargo to carry. Ships were being delivered and being mothballed almost immediately.

In this trading climate owners realised there were significant savings to be made by slowing ships even by just a few knots. This meant that owners and operators could deploy an extra ship to their Asia/Europe strings, using up excess capacity and saving fuel. Owners, however, have generally expected ships to speed up when global economic growth returns bringing with it more cargo. APL, however, has taken the courageous decision to optimise its ships for the speeds ranging from 14knots up to a top speed of 23knots, making the statement that the company believes that container ships will never again, in the foreseeable future, operate at the high speeds seen before the economic crisis.



The operating profile consists of a matrix describing time spent at each speed and draft combination

Svenssen confirmed the partners' view: "Container ships have slowed down for good; there is no compelling argument for high speed."

Design partners at DNV, HHI and APL recognised that container ships were operating at between 14 and 19knots for 90% of its operational time and that ship designs needed to be optimised for that range speeds. Travelling at up top 23knots is possible but the quicker the ship goes the less efficient it it.

DNV analysed the operating patterns of existing container ships and then developed a future operating profile, consisting of nine speed and draft conditions, as the basis for the design of the APL vessels.

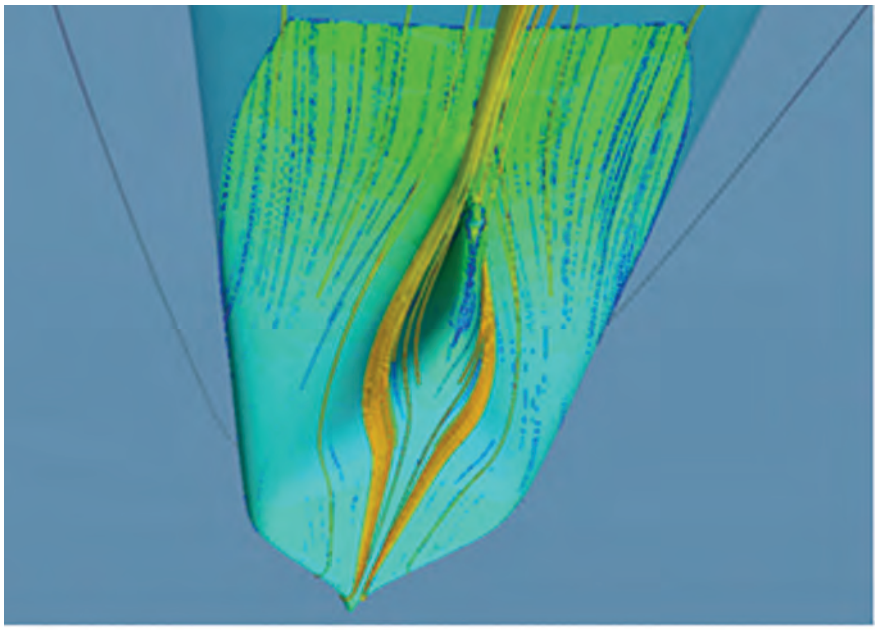
"We had been through a similar exercise for the design of Seaspan's 10,000TEU ships, but they are not owned by a liner operator so they are only optimised for a speed range and not for a particular route," says Svenssen.

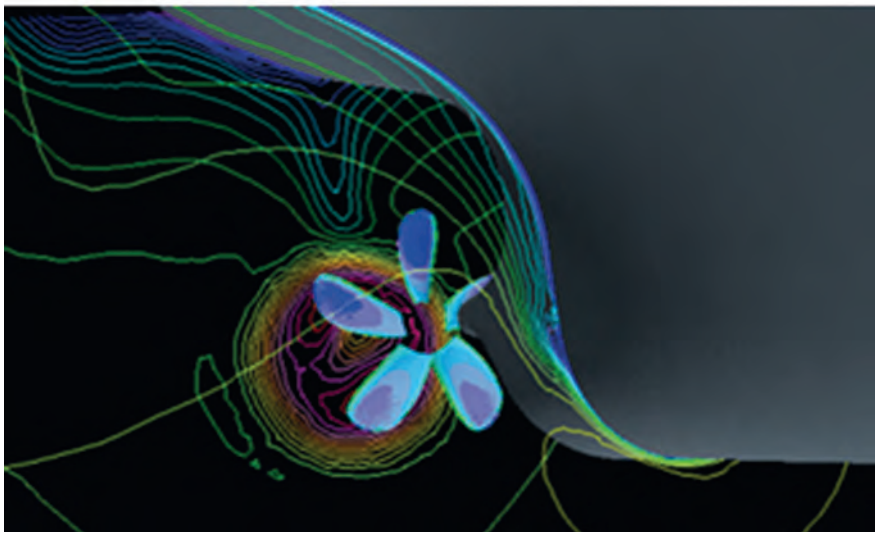
The APL vessels have also had the hull lines changed and the major component here is the bulb which was redesigned using CFD to reduce resistance from the bow wave. At the rear of the hull the wake drag has been further reduced, says Svenssen. "Ships can be improved by cutting part of the hull off and redesigning it, even some existing ships could be improved," he added.

The aft is optimised to allow for an even flow of water into the propeller and an even wake field. "The focus is to do a good job on the hull design," explained Svenssen.

Computer analysis allows designers to explore a range of variations in hull design and to calculate the effects of changes, the design calculations can then be further evaluated and tested through model tests, explained DNV.

Design variations meant that the APL hull form remained "relatively fine, so it had a better flow, but with a high beam for an improved cargo capacity. The ships will be 368m long, with a beam of 51m and a block coefficient of 0.67, says Svenssen.





CFD analysis has allowed naval architects to optimise the hull lines both at the front of the ship and at the rear

Positioning of the bridge and accommodation block forward of midships allows for a better view from the bridge, for manoeuvring, and increases the cargo capacity says DNV.

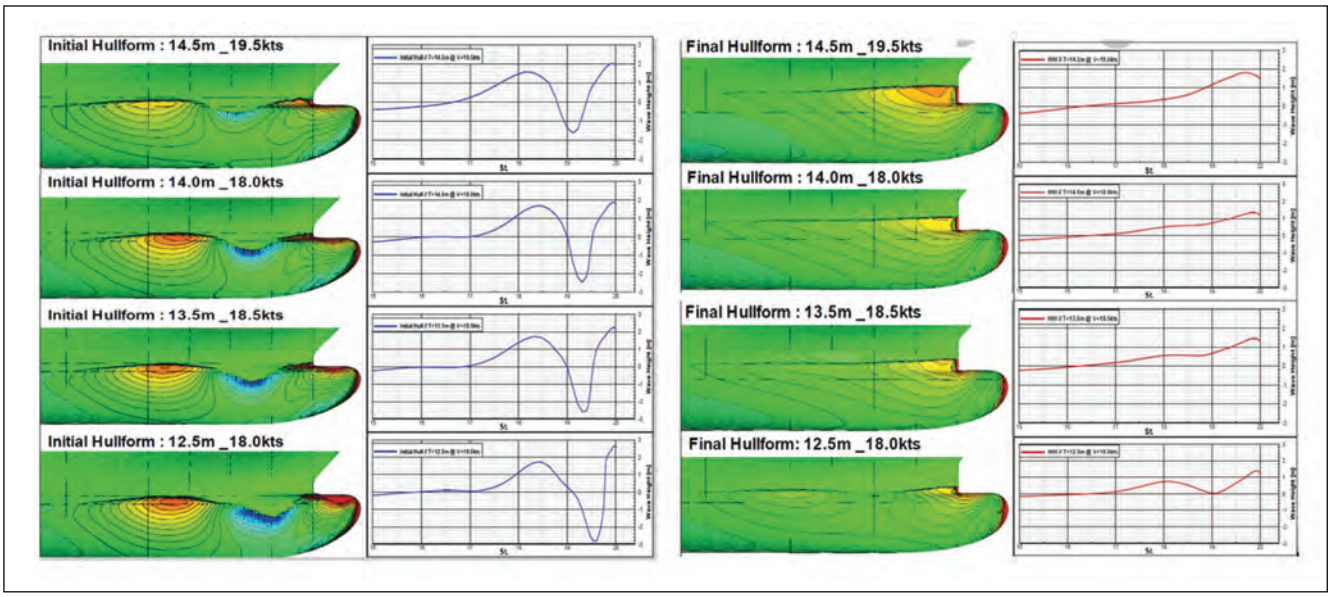
Ultra-long stroke MAN S90 ME C-9.2 engines will be installed on the APL ships. The engine is MAN's latest unit and is designed specifically for slow steaming vessels and will used with a large propeller.

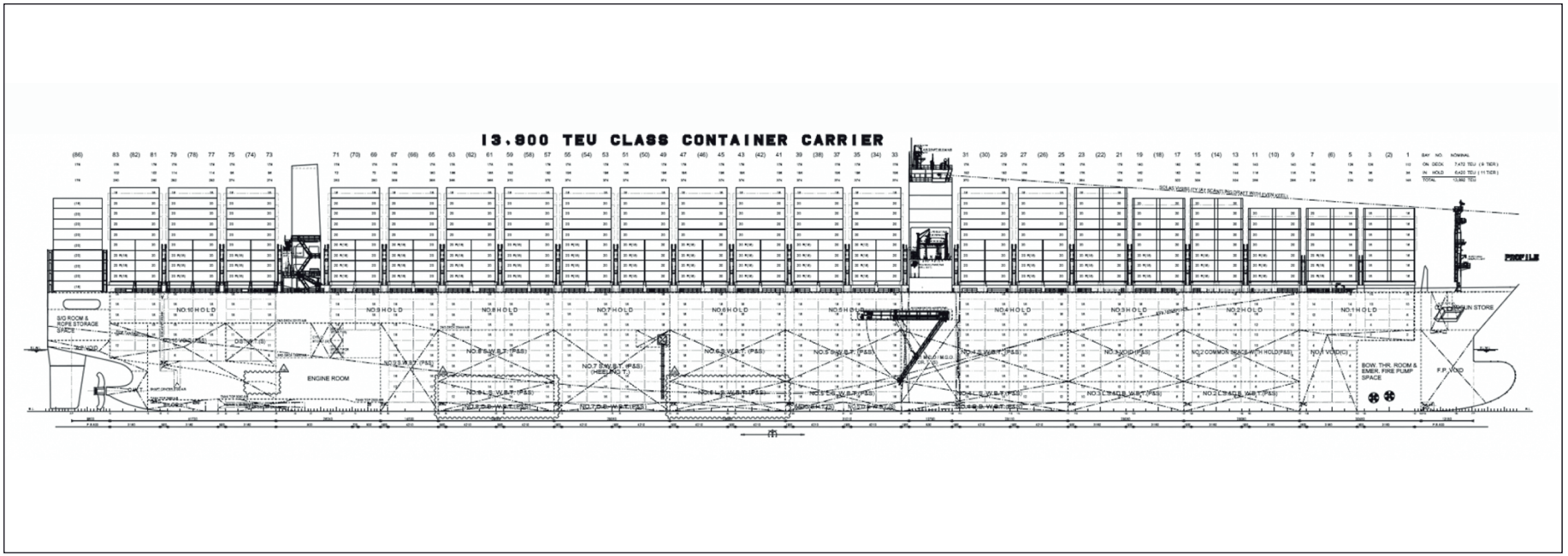
DNV expect that there will be some space set aside for a ballast water treatment system and possibly a scrubber.

In total the expectation from the new design, with no new technologies introduced, will save US$3 million in operational costs per year, a US$30 million annual saving over the 10 ship string. In addition the ships will have an energy efficiency design index value that is 36% below the IMO's baseline fulfilling the 2025 requirements.

By cooperating with the yard and class society APL has harnessed the expertise of a range of professionals that will bring them significant operational savings when the ships are delivered. Additionally the ship designs will meet future environmental regulation levels making the vessels attractive to both cargo owners and charterers. By grasping the nettle now APL stand to make significant gains from their courageous stance. *NA*

A paradigm shift in container ship design. The hull pressure and wave profile of final hull form





GA profile of 13,800TEU container carrier

The vessel was designed with the bridge and accommodation block forward to increase cargo capacity

ADVERTISERS' INDEX

If you would like to receive further information on the advertisers' featured within *The Naval Architect* please contact **John Payten, Group Sales Director,** jpayten@rina.org.uk

RINA publications

Books

Please note all prices include postage & packaging

GRAND DAME: HOLLAND AMERICA LINE & THE S.S. ROTTERDAM
By Stephen M. Payne FRINA
Stephen Payne, Naval Architect of modern day cruise ships, fully describes the Holland America line's flagship, S.S. Rotterdam, designed and built over thirty years ago and discusses her owners in his above mentioned book. Various chapters describe the building of the ship, her construction, her technical features, her passenger accommodation, and the Holland America line transition from Atlantic ferry to cruise ship operators.
Price: UK £10.00 EUR £12.00 OVS £14.00
(Amazon (UK) price: NA)

IMPROVING SHIP OPERATIONAL DESIGN
Compiled By The Nautical Institute Ref: ISOD
This book has been prepared to assist with the feedback from the user and is based upon a survey of the Institute's membership and the solutions advocated by experienced practitioners. The book is essential reading for all those involved in the design process whether in a shipping company, independent design office or shipbuilder. Also sea staff will understand more fully their essential role in communicating with design staff, particularly
when standing by a new building.
Member price: UK £26.50 EUR £29.00 OVS £32.50
Non-member price: UK £28.50 EUR £31.00 OVS £34.50

LAMENTABLE INTELLIGENCE FROM THE ADMIRALITY
By Chris Thomas
HMS Vanguard sank in thick fog in Dublin Bay in September 1875 rammed by her sister ship. No lives were lost (except perhaps that of the Captain's dog) but this one event provides valuable insight into naval history of the late nineteenth century. Chris Thomas examines what happened, setting it in the context of naval life, the social and economic situation of officers and ratings. He describes the furore caused by the unjust verdict of the Court Martial, vividly illustrating the joys and trials of the seagoing life in the Victorian era, and the tragic effect on the life of Captain Richard Dawkins and his family.
Price: UK £11.00 EUR £12.00 OVS £13.50
(Amazon (UK) price: £12.74)

SD14: THE FULL STORY
John Lingwood
The SD14 is almost extinct, and this book is a fitting tribute to a much-admired British designed cargo ship. Indeed, it should become the definitive history of the SD14 its derivatives. It provides a first-hand account of the SD14's conception and planning from a member of the design team, with many personal insights into the shipbuilding industry of the 1960s. Included are full career details of every SD14, the Prinasa-121s, the SD15 and the three SD18s: a total of 228 ships built wby seven yards in four countries. Every ship is illustrated, usually at several stages of its career, 99% in full colour.
Price: UK £29.00 EUR £30.00 OVS £30.50
(Amazon (UK) price: £31.00)

SHIPS AND SHIPBUILDERS: PIONEERS OF SHIP DESIGN AND CONSTRUCTION
By Fred Walker FRINA
Ships and Shipbuilders describes the lives and work of more than 120 great engineers, scientists, shipwrights and naval architects who shaped ship design and shipbuilding world wide. Told chronologically, such well-known names as Anthony Deane, Peter the Great, James Watt, and Isambard Kingdom Brunel share space with lesser known characters like the luckless Frederic Sauvage, a pioneer of screw propulsion who, unable to interest the French navy in his tests in the early 1830s, was bankrupted and landed in debtor's prison. With the inclusion of such names as Ben Lexcen, the Australian yacht designer who developed the controversial winged keel for the 1983 America's Cup, the story is brought right up to date.
Price UK £12.50 EUR £16 OVS £21
(Amazon (UK) price: £16.58)

THE ROYAL INSTITUTION OF NAVAL ARCHITECTS 1860-2010
Published to commemorate the 150th anniversary of the founding of the Institution, The Royal Institution of Naval Architects 1860-2010 provides a history of the Institution as reflected in the development of the naval architecture profession and the maritime industry over that time. In the book, members give their personal views on the development of their sector of the maritime industry and how it will develop in the future.
Price UK £5.50 EUR £6 OVS £7

WAVES OF CHANGE
By John E Robinson
Waves of Change is the first in a new series of books commissioned by The Nautical Institute to explore Maritime Futures. In this remarkable book the author sets out to explain how innovative technologies, particularly information systems, are impacting on industrial practices.
Price: UK £20.00 EUR £22.00 OVS £24.00
(Amazon (UK) price: NA)

Each month RINA offers up to 70% discount on the normal price of its publications.
Please visit the website at www.rina.org.uk/bookshop-bargains
to see this months specials.

Journals

THE NAVAL ARCHITECT

Published 10 times a year

- Providing up-to-date technical information on commercial ship design, construction and equipment.
- Regular reports on centres of shipbuilding activity worldwide.
- Comprehensive, technical descriptions of the latest newbuildings.
- News, views, rules & regulations, technology, CAD/CAM, innovations.

quarterly publication OFFSHORE MARINE TECHNOLOGY
bi-monthly publication WARSHIP TECHNOLOGY

2013 Subscription

Period	12 Months	24 Months	36 Months	Ref: J6
Inland:	£163	£282	£407	
Europe:	£170	£297	£424	
Overseas:	£182	£318	£457	

SHIP & BOAT INTERNATIONAL

Published 6 times a year

- In depth coverage of small craft/small ship design, building & technology.
- Specialist sections include: fast ferries, tugs, salvage & offshore, patrol & paramilitary craft, coastal & inland waterway vessels, pilot boats, propulsion and transmissions.
- Advances in construction materials, electronics, marine equipment.
- Contract news and the latest market developments.

2013 Subscription

Period	12 Months	24 Months	36 Months	Ref: J7
Inland:	£124	£217	£309	
Europe:	£131	£227	£327	
Overseas:	£149	£260	£374	

SHIPREPAIR & CONVERSION TECHNOLOGY

Published Quarterly

- In depth coverage of all aspects of shiprepair and conversion work and comprehensive technical descriptions of major conversion projects.
- Regular regional surveys on the major shiprepair centres.
- Developments in shipboard and shipyard equipment technology.
- Contract news, appointments, industry views, new regulations.

2013 Subscription

Period	12 Months	24 Months	36 Months	Ref: J8
Inland:	£57	£100	£142	
Europe:	£63	£109	£159	
Overseas:	£70	£119	£173	

RINA publications

Conference Papers

If the CD ROM format is required please add CD after the reference number.

		Non-Members	Members
2012	**Ice Class Vessels** Ref: ICE12	£130	£110
	Warship 2012: The Affordable Warship Ref: WS12	£130	£110
	ICSOT Korea: Developments in Fixed and Floating Offshore Structures Ref: ICSOT12	£130	£110
	The Systems Engineering Conference Ref: SOD12	£125	£105
	The Environmentally Friendly Ship Ref: EFS12	£125	£105
	Pacific 2012: International Maritime Conference Ref: PACIFIC12 - **CD ROM only**	£125	£105
	Managing Reliability & Maintainability in Maritime Industry Ref: RM12	£125	£105
2011	**International Conference on the Education & Professional Development of Engineers in the Maritime industry** Ref: EDP11	£125	£105
	Developments in Marine CFD Ref: CFDIN	£125	£105
	Human Factors in Ship Design & Operation Ref: HF11	£125	£105
	ICCAS 2011: International Conference on Computer Application in Shipbuilding Ref: ICCAS11	£145	£120
	International Conference on Marine Design Ref: MD11	£125	£105
	Warship 2011: Naval Submarines & UUV's Ref: WS11	£125	£105
	Design & Operation of Tankers Ref: TANK11	£125	£105
	Super & Mega Yachts Ref: SMY11	£125	£105
	Marine CFD Ref: CFD11	£120	£100
	High Speed Marine Vessels Ref: HSMV11	£120	£100
	Design & Operation of Passenger Ships Ref: PASS11	£120	£100
	The Damaged Ship Ref: DS11 - **CD ROM only**	£120	£100

International Journal of Maritime Engineering (IJME)

2013	*Members Part Ref: IJME13 Set Ref: ST13*	**Part A1** £15	**Part A2** £15	**Part A3** £15	**Part A4** £15	**Set** £41
	Non-Members Part Ref:IJME13 Set Ref: ST113	**Part A1** £22	**Part A2** £22	**Part A3** £22	**Part A4** £22	**Set** £74

International Journal of Small Craft Technology (IJSCT)

2013	*Members Part Ref: IJSCT13 Set Ref: SS13*	**Part B1** £15	**Part B2** £15	**Set** £27
	Non-Members Part Ref: IJSCT13 Set Ref: SS113	**Part B1** £22	**Part B2** £22	**Set** £41

For further information on previous editions please contact the Publications department on:
Tel: +44 (0) 20 7235 4622, Email: publications@rina.org.uk or Website: http://www.rina.org.uk

Payment Details: Payments must be made in pounds sterling to **RINA** by sterling cheque drawn on a UK bank, International Money Order or Credit Card, we accept Visa, Mastercard, or AMEX.

I enclose a cheque for _____ payable to RINA.

Please charge my Credit Card No: _____

Expiry date: __/__/__ Security code: _____ Signature: _____

Print name: _____

Name: _____

Address: _____

Country: _____ Postcode: _____

Tel: _____ Fax: _____ Email: _____

Please allow 30 days for dispatch and delivery. Post to:

The Marketing Department, RINA, 10 Upper Belgrave Street, London SW1X 8BQ, UK.

Tel: +44 (0)20 7235 4622 or **Fax: +44 (0)20 7259 5912.**

ORDER FORM

Please send me the following:

REF:NA/Oct12

REFERENCE	QUANTITY	PRICE
	TOTAL:	

For a publications catalogue please call the Publications Department on
+44 (0)20 7235 4622 e-mail: publications@rina.org.uk or visit our website at http://www.rina.org.uk

October 21-24, 2012
Interferry 2012, international conference, Dubai, UAE.
www.interferry.com

October 22-26, 2012
Euronaval 2012, international conference, Paris, France.
www.euronaval.fr

October 24-25, 2012
Marine Heavy Lift & Transport III, international conference, London, UK.
E-mail conference@rina.org.uk
www.rina.org.uk/heavylift2012

October 27-29, 2012
Seatrade Med 2012, international conference, Marseille, France.
E-mail info@cruiseshippingmiami.com
www.cruiseshippingmiami.com

November 7-8, 2012
ICSOT Indonesia: development in ship design and construction, Ambon, Indonesia.
E-mail: conference@rina.org.uk
www.rina.org.uk/icsotindonesia2012

November 13-15, 2012
METS, international conference, Amsterdam, The Netherlands.
www.metstrade.com

November 14-15, 2012
International conference on the Education & Professional Development of Engineers in the Maritime Industry 2012, seminar, Southampton, UK.
E-mail conference@rina.org.uk

November 21, 2012
President's Invitation Lecture, lecture, London, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/presidentsinvitationlecture2012

November 21-23, 2012
INMEX China, international conference, Guangzhou, China.
www. maritimeshows.com/china/

November 26-27,2012
Structural response under fire & blast, international conference, Croydon, UK.
www.maritime-conferences.com/asranet-conference/

November 27-28, 2012
Seatrade Middle East, international conference, Dubai, UAE.
www.seatrade-middleeast.com

November 27-30, 2012
OSEA 2012, international conference, Singapore.
www.osea-asia.com

November 30, 2012
SAFEGUARD Passenger Evacuation Seminar, seminar, London, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/passenger-evacuation-seminar

December 5-6, 2012
Historic Ships 2012, international conference, London, UK.
E-mail conference@rina.org.uk
www.rina.org.uk/historic_ships_2012

December 5-7, 2012
International Workboat Show, international conference, New Orleans, USA.
www.workboatshow.com

December 10-12, 2012
Design & Analysis of Submarine Structures, international conference, London, UK.
www.maritime-conferences.com/asranet-conference/

December 17-19, 2012
Structural Integrity Analysis (Fatigue & Fracture), international conference, London, UK.
www.maritime-conferences.com/asranet-conference/

January 30-31, 2013
Damaged Ship Conference II, London, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/damaged_ship_2013

February 26-27, 2012
International Conference on the Education and Professional Development of Engineers in the Maritime Industry, international conference, Singapore.
E-mail: conference@rina.org.uk
www.rina.org.uk/education-conference-2013

February 26-28, 2013
Asia Workboat 2013, international conference, Singapore.
E-mail: marinfo@baird.com.au
www.bairdmaritime.com

March 11-14, 2013
Cruise Shipping Miami, international conference, Miami, USA.
www.cruiseshippingevents.com

March 20-21, 2013
SURV 8: Surveillance, search and rescue craft, international conference, Poole, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/Surv8

March 20-23, 2013
Europort Istanbul, international conference, Istanbul, Turkey.
E-mail: info@europort.nl
www.europort-istanbul.com

April 9-11, 2013
Sea-Asia, international conference, Singapore.
E-mail: events@seatrade-global.com
www.sea-asia.com

April 16-17, 2013
Advanced Materials for the Marine and Offshore Industry Conference, international conference, London, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/materials_conference

April 18, 2013
Marine Coatings Conference, International conference, London, UK.
E-mail: conference@rina.org.uk
www.rina.org.uk/marine_coatings

May 6-9, 2013
OTC, international conference, Houston, USA.
E-mail: OTC@experient-inc.com
www.otcnet.org

May 8-9, 2013
Design and Construction of Super and Mega Yachts, international conference, Genoa, Italy.
E-mail: conference@rina.org.uk
www.rina.org.uk/super_yacht

International Conference on Ship and Offshore Technology

"Developments in Ship Design & Construction"

Ambon, Indonesia, 7-8 November 2012

Organised by the
Royal Institution of Naval Architects
&
The University of Pattimura

Second Notice

Today, the international maritime industry faces new challenges as it emerges from the global financial crisis. It is therefore understandable that the industry's priority and attention is on consolidation and continued survival. However, at such a time it is all the more important for the industry to look ahead in order to respond to the continuing challenges it will face from the increasing demands of operators, regulators and society for greater efficiency, safety and the protection of the environment, as it emerges from the current crisis. This response will require innovative thinking from all sectors of the maritime industry, and particularly those involved in ship design and construction.

The International Conference on Ship & Offshore Technology – Indonesia 2012 will take "Developments in Ship Design & Construction" as its theme, and will bring together members of the international maritime industry to present and discuss the latest developments in the ship design and construction process which will provide the improvements in productivity and cost-competitiveness necessary to respond to the demand for lower cost of ownership and greater environmental sensitivity. Whilst covering developments in all ship types, it will look particularly at developments in those vessels which are essential to the economies of countries in the region, e.g. fishing vessels.

The conference will cover a wide range of topics with papers such as:

-**On The Seakeeping of Survey Vessels**, B. Abeil, MARIN
-Stability Of Ship With Large Breadth-Draft Ratio In Following Quartering Seas, D. Paroka, Hasanuddin University
-**Design Aspects of Offshore Platform for Combining of Marine Current and Offshore Wind Energy Conversion Plant in Indonesia**, A. Suroso, ITS
-Numerical Simulation Into Drag Characteristic of Symmetrical and Asymmetrical Catamarans With Various Demihull Separations, A. Jamaluddin, Indonesian Hydrodynamics Laboratory
-**Preliminary Study Into The Selection Of Passenger And Cargo Vesses For Eastern Indonesia,** K. Utama, ITS

☐ I wish to receive details on exhibition space and sponsorship opportunities
☐ I would like to receive a full programme brochure and registration form

Name: Position:
Company:
Address:

Postcode:
Telephone: Fax:
Email: **(I2012)**

Please return to: Conference Department, RINA, 10 Upper Belgrave Street, London SW1X 8BQ
by fax on +44 (0)20 7259 5912 or by email: conference@rina.org.uk

First in Class
200 million GT

As the world's economy grows and changes, our industry is faced with ever greater challenges. At **ClassNK**, our understanding of these challenges and our commitment to helping the maritime industry secure a safer future has made us the leader in ship classification. In May 2012, we became the first classification society in history to have more than 200 million gross tons on our register, and as the world's largest classification society, we are dedicated to ensuring the continued growth and development of the maritime industry around the world. Learn more about our efforts to build a better future for shipping and shipbuilding at www.classnk.or.jp

Global Authority in Maritime Standards

ClassNK 200 million GT First in Class

www.classnk.or.jp