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NOVEMBER 2013

Marine Propulsion

Is Slow Steaming Here to Stay?

Dr. Herbert Aly
B+V Shipyard Boss Talks Reorganization

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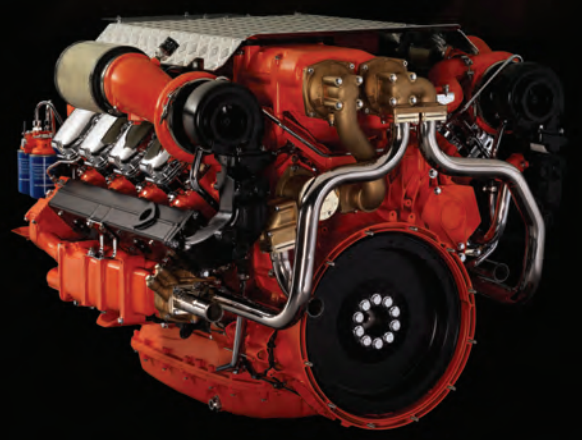

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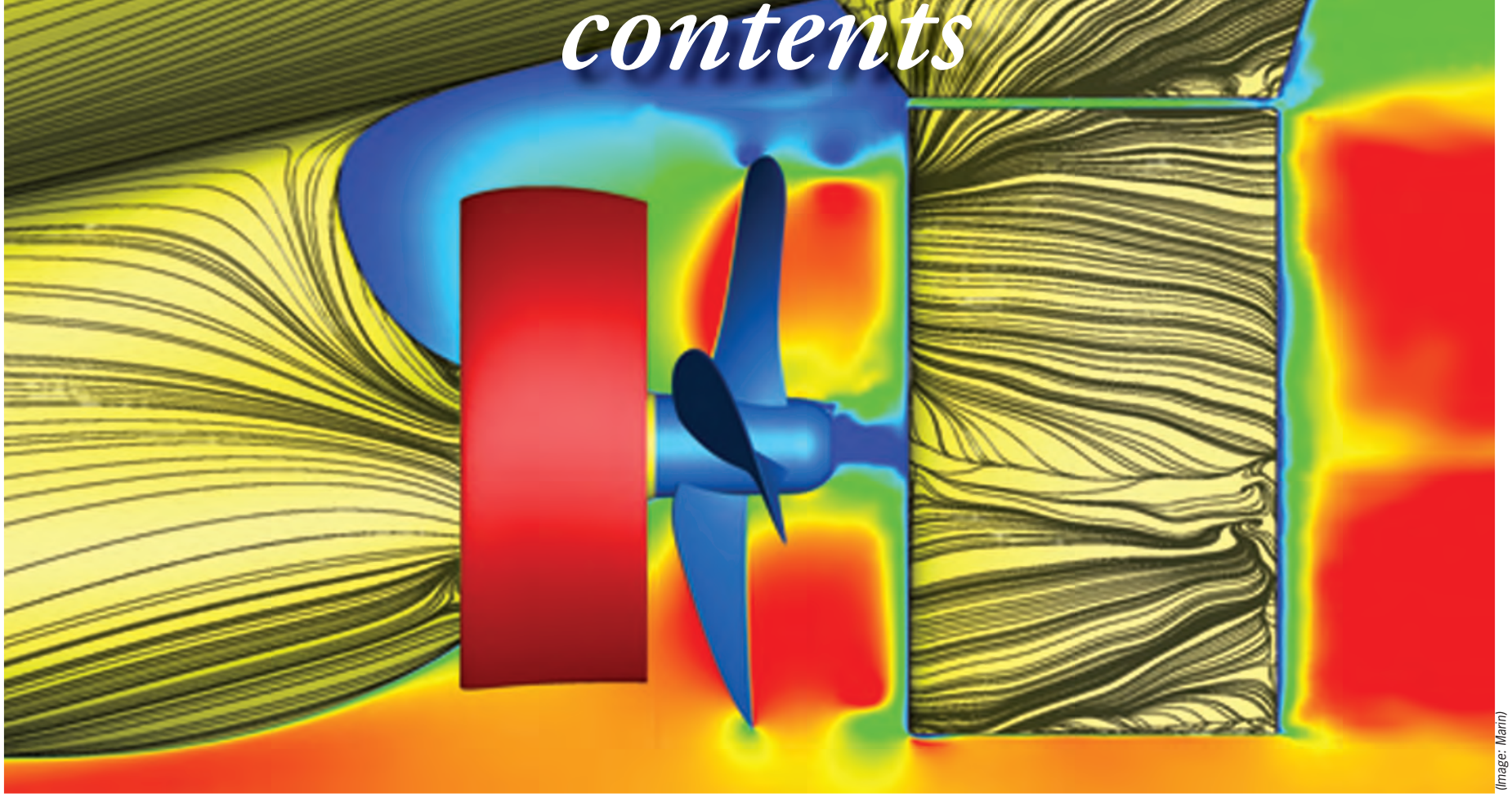

(Image: Marin)

Power Play

MARIN increasingly uses CFD to study Energy Saving Devices on ships. **See story page 18.**

ONE ON ONE

EYE ON DESIGN

MARINE PROPULSION

FLUIDS

OFFSHORE DEEPWATER

30 SLOW IT DOWN

OFFSHORE DEEPWATER

TRAINING

MARITIME SECURITY

ON THE COVER

Slow and Super Slow Steaming are here to stay, as ship owners such as Germany's NSB realize a postive impact on the bottom line. Story starts on page 30.

(Image: MAN Diesel&Turbo)

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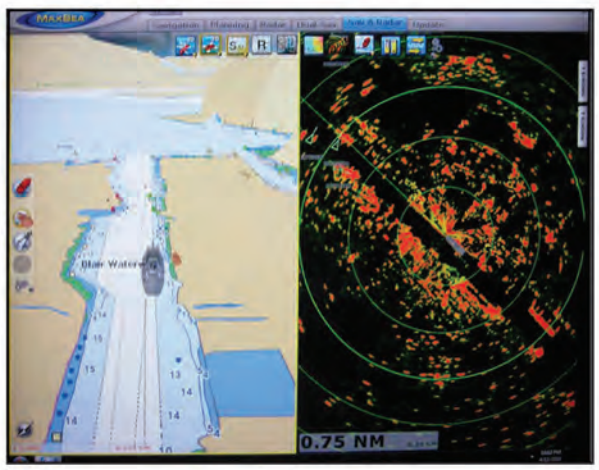

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the interviews

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> "The misconceptions surrounding LNG at all levels is astounding."
>
> **Peter I. Keller, President**
> **Sea Star Line, a TOTE Company**

Last month more than 100 executives from ship owning, ship building and marine equipment and service supply companies trekked from around the world to Stamford, Connecticut for the 2nd Annual Shipping Insight Conference. While the event was certainly small in comparison to some of the mammoth global gatherings, it proved to be a diverse, well-heeled group and what ensued were two full days of lively conference, debate and after-hours meetings.

The theme of Shipping Insight 2013 was Fleet Optimization, a concept that is hardly novel to readers of these pages. Leading off on day one, Keynote Speaker **Peter I. Keller**, President of Sea Star Line, a TOTE Inc. company, discussed at length not only the company's well-recorded plans to build and operate the world's first LNG-powered containerships, but also the company's strategy behind the choice of LNG versus, for example, scrubber technology. "This is how we see LNG," Keller said, "we understand that when you change the fuel itself, you get to the root of the problem: the fuel itself."

While LNG and marine propulsion technologies were not the sole theme of the Shipping Insight Conference, it certainly seemed to dominate the agenda, yet another signal of the prevalence and rapid move towards wider adoption of LNG as fuel on ships and boats.

Perhaps most interesting, and a common theme throughout the presentations, was the general lack of knowledge and resulting paranoia of using LNG as a fuel in the marine environment. As Keynote Speaker Keller put it best: "The misconceptions surrounding LNG at all levels is astounding."

Mark Barker, president of Interlake Steamship Company, which recently announced its plans to convert its fleet of Great Lakes bulk carriers to operate on LNG, was a headliner on the "Fuel and Propulsion Management" panel at Shipping Insight. He said, "we thought scrubbers would be a solution, but when we saw ECA, we knew not." While he is convinced that the move to LNG propulsion will solidify his mission to be "the long-term, low-cost transport provider" he admits that current perceptions of LNG is dangerous, and that a big public outreach program is needed to help dispel fear and inaccuracies.

While we cannot possibly predict the rapidity, it is safe to assume that LNG as fuel in the marine environment is here to stay, as the number and size of early adopters is gaining momentum. **Johan Sperling**, vice president of Crowley/Jensen Maritime, said "LNG makes a lot of sense. We deliver fuel all over the place, in large and small quantities, and we intend to do that with LNG, as well as invest in LNG-powered vessels."

While LNG is the hot topic du jour in many sectors, the advent of Slow and Super Slow Steaming is rapidly gaining in the oceangoing big ship sector, as reducing a ship's speed has an undeniable positive impact on fuel and emission reduction.

This month Peter Pospiech, our German based correspondent, addresses the topic in detail starting on page 30, exploring how Germany's NSB was able to slow its ships down – in some cases reducing speed up to 50% – and save millions in fuel costs as a result, all the while navigating some substantial, but manageable technical challenges.

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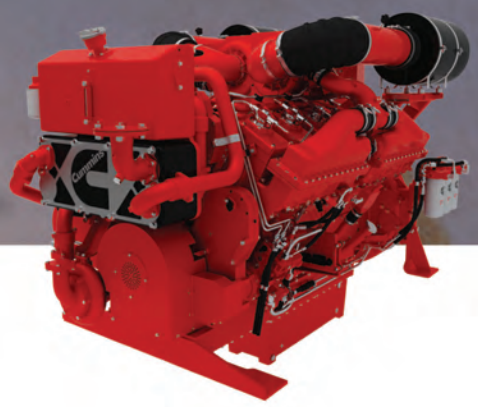

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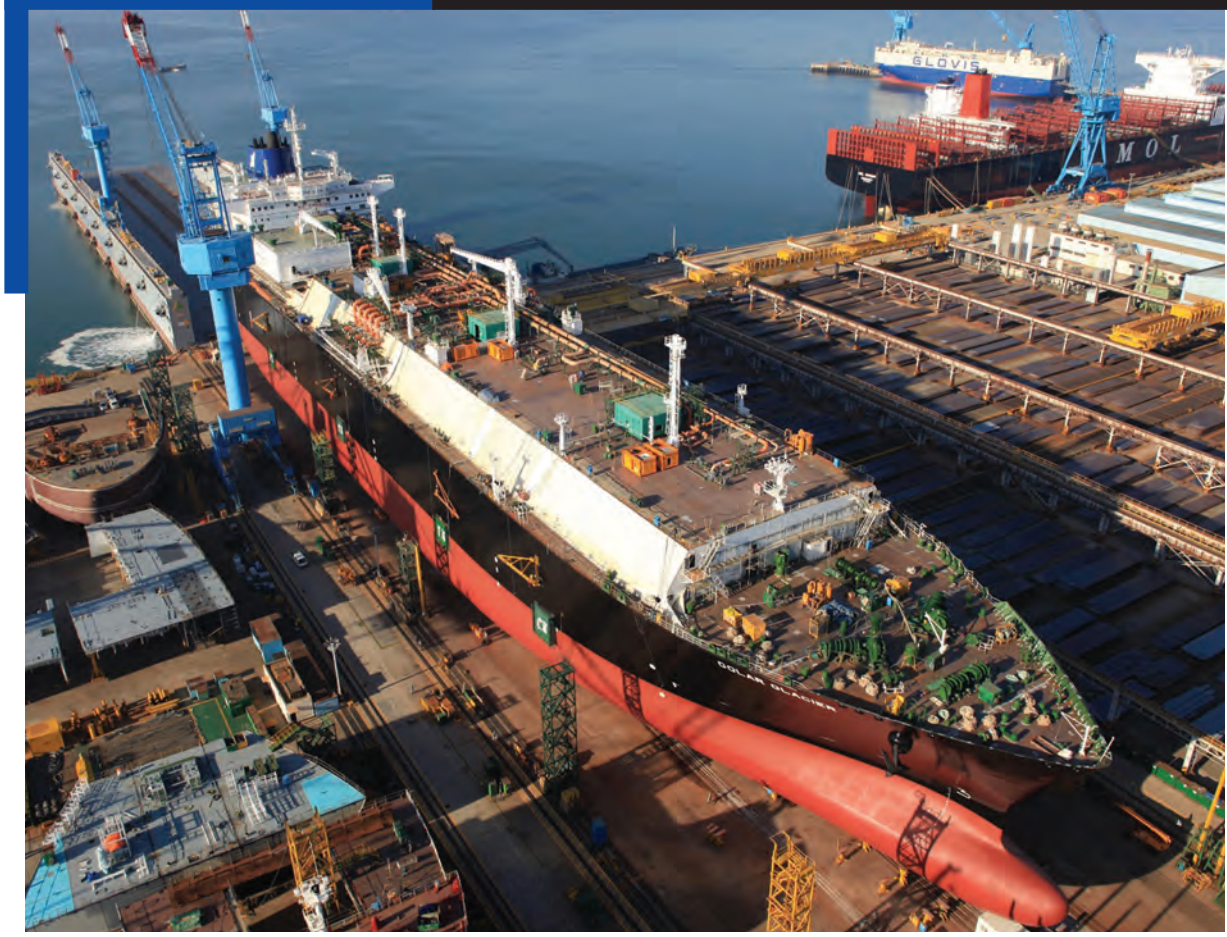

World First

Hyundai Samho Launches LNG Carrier Built On-ground

Hyundai Samho Heavy Industries (HSHI) launched a 162,000 cu. m. LNG carrier built using the on-ground shipbuilding method for the first time in the world, the shipyard claims. The vessel, designed for delivering chilled natural gas, was ordered by Golar of Norway in February, 2012. It, measures 289 x 45.6 m with a 26 m depth, and is scheduled to be delivered in July 2014 after outfitting and painting.

After about 270 large blocks, LNG containment system, an engine, a propeller are manufactured and assembled in the on-land shipbuilding area equipped with a 1,200-ton gantry crane, four jib cranes and a floating dock, the assembled LNG carrier is loaded out onto a floating dock by hydraulic skidding, then the LNG ship is launched out by submerging the floating dock. Striking balance of the LNG carrier, which is about 30% heavier than other type of ships of this size, on the hydraulic skidding facility and on the floating dock is the critical point of launching. Though this is the first LNG carrier Hyundai Samho has built using the on-ground method, the company has already built 50 other ships using this method since May 2008.

Leevac Delivers Z Tech Tug

Bay-Houston Towing received its first Z Tech 2400 tugboat, the Chloe K, designed by Robert Allan Ltd. and built by Leevac Shipyards. These are a smaller version of the Z Tech 7500 tugs that are already in Bay-Houston Towing's fleet. While the 7500's, are primarily used at LNG terminals with large tankers and post-Panamax containerships, the 2400 series will be capable of operating in the waters of all of the ports the company services, including the confined quarters of the Houston Ship Channel. Bay-Houston Towing provides tug service in Houston, Galveston, Texas City, Freeport, and Corpus Christi, Texas. Chloe K measures 80 x 38 ft., with a working draft of 16 ft.. It is powered by two of Caterpillar's 3516C HD engines, delivering 2575 hp each. At 5150 hp, the tugs will be capable of docking even the largest vessels calling on the Texas coast. The vessel is designed to produce a minimum of 60 metric tons of bollard pull. The Caterpillar engines are mated to Model SRP-1215 Schottel drives, driving 94 in. stainless steel propellers. Markey Machinery Company Inc. provided the bow winch, a Model DEPCF-48S Escort Line Winch. The winch has an automatic render/recover mode and is equipped with an application specific Markey tension meter. The winch has a brake capacity of 330,000 pounds. Electrical power is provided by two John Deere 6068TFM76-ABS-T2 gensets, each rated at 99 kw.

News in Brief

Tanks Installed on World's First FLNG

Wison Offshore & Marine completed the installation of the three LNG storage tanks into the hull of the Caribbean FLNG project, considered a significant milestone in the delivery of the world's first floating LNG production unit. With this major activity completed, the pathway is clear for installing the barge deck and topsides on the project. The Caribbean FLNG project, being supplied to EXMAR by Wison Offshore & Marine under an EPCIC contract, will be installed off the coast of Colombia. The project started fabrication at the end of 2012 and is planned to be in operation the first quarter of 2015 as the world's-first FLNG vessel.

The project is progressing on schedule, and expected to be mechanically complete in April 2014 with sail away in the fall of 2014. Supplied by TGE, the combined capacity of the three LNG storage tanks is 16,100 cu. m., with a net weight of around 395 tons each.

(Photo: Wison)

Madame Gu: Largest Netherland Superyacht

Navis Engineering concluded a contract to supply a dynamic positioning (DP) system to the largest superyacht to be constructed in The Netherlands, the 99m Madame Gu. Built at Feadship in steel and aluminum over four years, the superyacht is powered by four MTU 20v diesel engines and can reach a top speed of 24 knots. It measures 99 x 13.6m, with a maximum draft of 4.6m, is classed by Lloyd's Register and is MCA compliant. Madame Gu's particular features include accommodation for up to 12 guests in six state rooms including a master state room and five guest cabins. The vessel also carries a crew of 36, sleeping in 18 crew cabins. Special amenities include a fully enclosed helicopter hangar, two 11m yacht tenders and scuba gear.

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(Photo: USAC)

UASC & HHI

In the quest for large containerhip efficiency, United Arab Shipping Co. turns to HHI & FutureShip

United Arab Shipping Company (UASC) will expand its fleet with new efficient container vessels. Built to DNV class, the designs have been optimized through a cooperation between FutureShip and Hyundai Heavy Industry (HHI). Setting its sights on competitive slot cost, UASC, one of the world's fastest growing container carriers, has ordered five 14,000TEU vessels with six options and five 18,000TEU vessels with one option.

Like the rest of the marine world, minimizing fuel consumption and emissions loomed large in the decision to order, and UASC partnered with FutureShip with the aim to realize an efficient design.

Four sets of designs were shortlisted for intensive evaluation by FutureShip with numerical tank towing tests based on Computational Fluid Dynamics (CFD) simulations for the ship with propeller. In four weeks, FutureShip ran thousands of tests to determine the speed-power relationship for the two ship classes at two drafts for each of the four competing designs, adding up to some 1.7 million CPU hours, or 200 CPU years. The use of massively parallel computation allowed multiple tests to be run at the same time, over speed and draft ranges which reflected realistic operational profiles.

The four designs were all well matched, with HHI's design emerging as the winner due to a 14,000TEU vessel design that outperformed the competition and the most efficient (single-skeg) vessel design at 18,000TEU. A formal parametric optimization was also conducted to fine-tune vessel performance for UASC's operating profile in the intended service pattern of the ships.

For final validation, professional model tests were conducted at the Hamburg Ship Model Basin. The model tests backed up FutureShip's CFD predictions, supporting the accuracy of the optimization results.

To realize further efficiency gains on the operational side, UASC decided to implement FutureShip's "ECO-Assistant" trim solution. Backed up with a comprehensive database of possible operational conditions evaluated by CFD analysis, this tool provides an intuitive interface to select the most efficient trim for every voyage.

News in Brief

Seaspan: Historic Deal for 10 Non-combat Ships

Seaspan's Vancouver Shipyards announced that it will build an additional 10 Noncombat vessels for the Canadian Coast Guard. The new ships increase Seaspan's noncombat build package to 17 ships from the seven originally announced on October 19, 2011. These additional ships include five medium endurance multitasked vessels (MEMTVs) and five offshore patrol vessels (OPVs).

Through the NSPS, Seaspan will develop and grow a world-class shipbuilding and ship repair center of excellence on the west coast that will create significant economic benefits for BC and Canada for decades to come. "We are one year into our Shipyard Modernization Project, and with approximately one year remaining, the transformation of Vancouver Shipyards has been profound," said Brian Carter, President - Seaspan Shipyards. "In addition to the progress on facilities, we are making a huge investment in people, processes and tools."

Aliança Christens New Containership

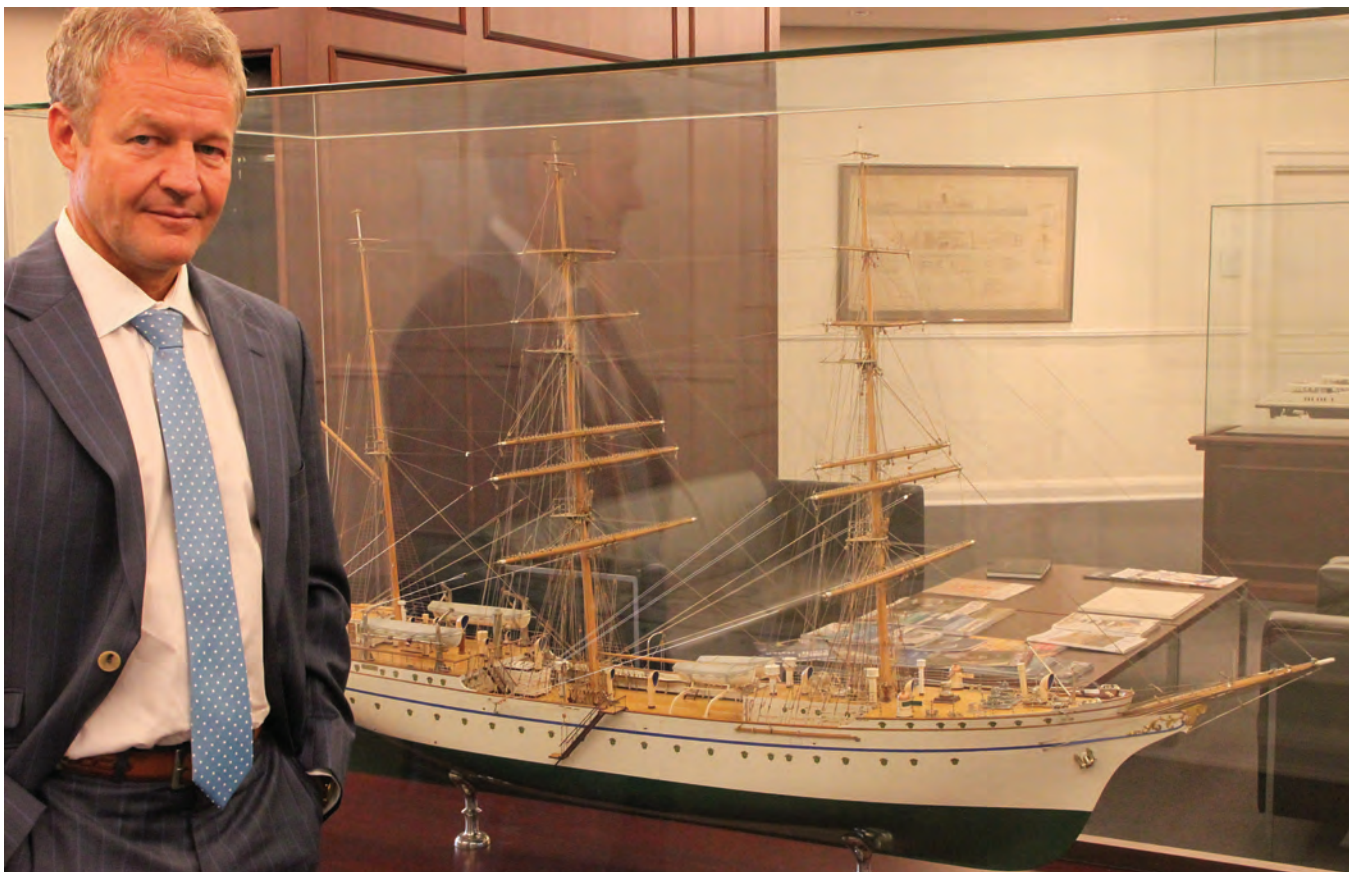
With the Américo Vespúcio, Hamburg Süd subsidiary Aliança christened the third of four identical 3,800 TEU container ships for its cabotage fleet on October 22, 2013 in Pecém (Brazil). The newbuild series allows Aliança to progress with the modernization of its fleet. Like the first two newbuilds, the Américo Vespúcio was also built at the Shanghai Shipyard Co., Ltd. and was delivered on August 23, 2013. After completion of import formalities the ship was loaded with the first containers for the Aliança cabotage service on October 14, in Manaus.

L to R: Norbert Bergmann, Andre Magalhaes, Julian Thomas, Ivens Dias Branco, Consuelo Dias Branco, Frank Smet, Martin Susemihl, Capt.Carlos Camara und Matthias Dietrich.

Dr. Herbert Aly

Shipyard boss Dr. Herbert Aly discusses Blohm+Voss' radical reorganization as well as the strategies to secure new orders.

By Peter Pospiech, Dipl.-Ing., Germany



When I started my nautical career at Blohm+Voss at the beginning of the early 1960s, one could see on the southside of the river Elbe nine independent operating shipyards. Today only one remains: Blohm+Voss. More than 100 years experience, technical know-how and modern production technology helps to ensure the international global competitiveness of the City of Hamburg as an important site for shipbuilding. The biggest shipyard of Hamburg is Blohm+Voss - an enterprise with more than 135 years of history. The company owns seven docks offering capacities for ships up to 320,000 dwt, including one of Europe's largest dry docks, Blohm+Voss Dock Elbe 17, with a total length of 352m.

The site belongs to the cityscape like the St. Michael's church, or the city lake Alster – their history dates back to the year 1877. In the 1920s the shipyard employed more than 10,000 employees – ranking it as the biggest employer in the Free and Hanseatic City of Hamburg. Well-known ships such as Europa, Bismark, Wilhelm Gustloff, Gorch Fock and Cap Arcona – and many others – have been launched here. The shipyard has, during its 135 years of history, experienced and survived many "ups" and "downs". The last "down" during the worldwide economical crisis in 2009/2010.

TOP

Shipyard boss Dr. Herbert Aly in Front of the German Navy sail training ship Gorch Fock where he was a crew member during his naval service.

BOTTOM

Aerial photo of the Blohm+Voss.

Can you please provide a short overview of your career and current position?

I was born in 1958 and grew up in the Harz region, in the city of Clausthal-Zellerfeld. After graduating from high school I spent 12 years in the German Navy, among others also on the sail training ship Gorch Fock. During this time I completed mechanical engineering studies. After termination of my service in the navy I worked at Blohm+Voss and was responsible for the power plant business. During this time I finished my doctorate on the topic of "Hydrogen and Energy Economy." From 1996 on I spent years in different German energy companies. In 2004, I came back to Blohm+Voss and was a member of the board of ThyssenKrupp Marine Systems AG until 2012, and since 2008 Chairman of the Board of Blohm+Voss Shipyards GmbH as well as Blohm+Voss Repair GmbH. After the sale of the civilian shipbuilding activities implemented by ThyssenKrupp Marine System in February 2012 I took over the presidency of both the enterprises, this also under the new ownership as a Managing Partner.

Blohm+Voss is well-known and regarded globally, having built many great ships over the years. What were the reasons for the radical reorganization of the shipyards structure in 2009?

Already before the world economic crisis and under the aegis of ThyssenKrupp Marine Systems, we started with the reorganization in 2008. During that period we realized that merchant ships could be produced at considerably more favorable conditions in Asia than by us – so we needed to direct our attention on special ships in those areas where Blohm+Voss has the knowledge. That were naval shipbuilding and yachts. The company has a long tradition in the building of exclusive yachts: the very first luxury yacht for cruises were supplied by Blohm+Voss already in 1900 – it was the Prinzessin Victoria Luise. The high product quality is approved, for example the Savarona, built in 1931 and still in service. The requirements in yacht building are essentially different of this in naval shipbuilding. Yachts built by Blohm+Voss are so called "one-offs," meaning they are built only one time, with a one-off expenditure in design and construction. In the segment of naval shipbuilding ship plans are worked out and the ships are build in small batches. This means, structures in naval shipbuilding are different for processing an order than in yacht building. In the yacht building we adapted our structures on the very specific characteristics and we can react flexibly and fast on a customer's wishes. An additional difference can be seen in the building location. Naval ships are produced mainly in the principal's country, whereby yacht customers pay to have their ships built in Germany by Blohm+Voss.

Furthermore, we see with yachts a growing market, which is for Blohm+Voss a suitable "special ship" segment, where we have a brand which is recognized for quality, exclusivity and manufacturer character. Against this background, the newbuilding segmentation has been done in a naval and a civilian part to venture a comeback in the yacht business.

Diversity is a staple at Blohm+Voss. Starting right and rotating clockwise are:

Super Yacht Palladium built by Blohm+Voss.
One of Europe's largest dry docks, Blohm+Voss' Dock Elbe 17, with a total length of 352m.

MV Charlotta Star during repair/underwater painting in one of Blohm+Voss' floating docks.
German Navy's Frigate in one of Blohm+Voss' sheltered docks.

How does the today's structure looks like?

After the takeover of the civilian ship building activities by Star Capital Partners as the new owner, basically we have two divisions: newbuild and repair. Blohm+Voss Shipyards GmbH for the complete new building activities and the Blohm+Voss Repair GmbH for repair and modification. Both divisions support each other. The shipyards core business is on the one hand the modification and repair of ships and offshore units as well as the building of premium-segment yachts. At new buildings Blohm+Voss works as a subcontractor for ThyssenKrupp Marine Systems during the next years, among others, on frigate orders for the German Navy.

Which strategies promise success against yards in the Far East?

At Blohm+Voss we will, and this is very essential, concentrate on megayachts. Here we have, as mentioned before, a long tradition. Certainly, we have to anticipate that somewhere in the future also luxury yachts will be built in China (as indicators already suggest). Fortunately customers in this segment still have a substantial brand consciousness. The customer wants to have an upmarket quality product out of Germany – and this is what we offer. Still we have here a technology and brand advantage. That means for us we have to assert ourselve on this particular market with highest quality and excellence.

How is your current order situation?

We have one megayacht in production which is in the outfitting phase. We are shortly to receive an order for another luxury yacht. Furthermore we are working on different yacht projects which are coming into near decision with the customers. With the repair situation we can be absolutely satisfied – our capacity in this regard is being fully utilized. Of course, we cannot look into the future and beg reassured, particularly as the repair sector is too volatile.

If you could make two wishes for Blohm+Voss, what would it be?

First unlimited financial guarantees for our business, because it is for the time being, one of the big problems for the whole branch to receive financing or, as in our case, even refund guarantees for down-payments from banks. Others, such as insurance companies, have to fill the gap. And on the other hand a more steady capacity utilization, in other words: it would be a big challenge for us, if two yacht orders came into the house exactly at the same time which should be processed totally in parallel.

A final private question: how and where does Dr. Herbert Aly relax?

Dr. Aly points towards a large photo on the wall in his office and smiles: "Look at this, this is my passion. Unfortunately I sail this beautiful schooner very seldom – at least I could make it to sail it 10 days in this year. On top of this, I own a catamaran and dragon on the Alster – if it can be leisurely I use the dragon but with stronger wind I take the cat. But as mentioned: unfortunately I do not have enough time to practice this beautiful sport.

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Knowledge is Power

The case for independent monitoring and verification of energy-efficiency initiatives

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World crude production may rise and fall, but the historical trend shows a steady increase in the price of a barrel of oil, and with it, the price of a ton of fuel. Add the demands of shareholders and charterers to increase operational efficiency and profitability, as well as increasing international pressure to reduce fuel consumption and associated greenhouse gas emissions. It is no wonder that ship owners have seen a steady rise, as well, in the availability of technologies — from ship design to propulsion and HVAC systems to hull coatings — that are purported to reduce fuel consumption.

Ship owners are interested in fuel savings technology, but they are understandably skeptical: How do they know they are achieving the fuel savings and associated payback periods? Can the ship owner or operator measure with any sense of confidence the actual savings they are able to realize from an energy efficiency investment?

Unfortunately, ship owners often do not have access to independent performance data for verification. For this reason, they expect manufacturers to provide evidence of independent third-party empirical product testing to substantiate quality, performance and regulatory compliance. When making a substantial energy efficiency investment, vessel owners and operators also expect a fundamental cost-benefit analysis of projected savings and payback.

Above and beyond requiring suppliers to provide this fundamental evidence of product quality and performance, a ship owner can only project the savings from an energy initiative and validate its performance through independent energy monitoring and verification. Moreover, they can derive the full value of this approach when an onshore team of professional marine engineers and energy analysts leverage existing ship systems to collect the data, remotely monitor and analyze trends, offer recommendations to improve existing systems, and project the costs and benefits of upgrades.

Analysis of Noon Reports, or ...

Analyzing a vessel's noon reports for fuel consumption trends over time is a complex, time-consuming process to which most ship owners simply cannot devote the resources. However, there is a cost-effective alternative: For a minimal capital investment and monthly monitoring fee, a ship owner can contract with a third-party marine monitoring and verification service for continuous remote monitoring and analysis of real-time data from a vessel's onboard machinery plant control and monitoring system (MPCMS).

Ideally, an energy advisory firm begins with an initial analysis of the vessel's performance by ship system. The firm should leverage the ship's existing metering devices and MPCMS to the extent possible, testing and validating the accuracy of measurement devices already in place, recalibrating as necessary, and installing additional metering devices as required. For example, where fuel measurement is not available on board, it is necessary to add fuel meters.

All existing and new devices should be integrated into the MPCMS so that real-time data can be pushed to the web at defined time intervals, ideally, every few minutes around the clock. The monitoring system should be built on open system standards that can be tailored to any type of vessel. The global monitoring center should itself be a secure, reliable data center, and the provider should store all operating data in the "cloud" using a secure Tier 1 collocation center. The monitoring center should be staffed with a team of degreed, licensed marine engineers and energy analysts with the requisite knowledge to analyze and interpret operating data.

The team monitors detailed ship system data, which may include main engine performance and fuel consumption including auxiliary generator performance, vessel position, fuel consumption, shaft horsepower, torque vs. revolutions per minute (RPM), and speed over ground vs. RPM. The service may also meter and monitor the ship's HVAC system and electrical generation for hotel load. The team also integrates real-time data on weather and sea conditions into the monitoring system.

Ideally, the team should monitor the ship for a period of time to establish an operational baseline from which optimal operating parameters can be established. From this, the team can set up the monitoring system to automatically transmit alerts and alarms to ship engineers and operators when equipment and ship systems are operating outside of these parameters. Establishing a baseline also enables the advisory team to compare vessel performance before and after an energy-savings initiative, such as a performance hull coating.

Results of Real-Time Performance Monitoring

In addition to immediate alerts and alarms when systems are operating outside of optimal parameters, the provider should issue daily fuel consumption and voyage reports that enable the owner to make informed fuel purchasing decisions based on historical and forecasted operations; validate emission regulation compliance — and validate the performance of energy-efficiency initiatives.

The team can also recommend maintenance and operational adjustments to existing systems and equipment, as well as capital improvements, that will improve the overall energy efficiency of the vessel. For example, one of the key indicators of the operating condition of a diesel engine is the exhaust temperature from individual cylinders. Most commercial diesel engines have cylinder exhaust temperature indicators. Older smaller engines have analog reading thermometers while the modern larger engines typically use thermocouple pyrometers. \

Ship owners are interested in fuel savings technology, but they are understandably skeptical:
How do they know they are achieving the fuel savings and associated payback periods?

A comparison of individual cylinder exhaust temperatures to one another and to the aggregate engine exhaust temperature yields many insights; therefore, monitoring of cylinder exhaust pyrometers is one of the most important diagnostic tools. Abnormal cylinder exhaust temperatures indicate many types of operating problems that increase fuel consumption, including cylinder imbalance, exhaust valve leakage, incorrect injection and/or exhaust valve timing, poor fuel atomization, low compression pressure, and turbocharger issues.

The energy advisory service should be able and willing to advise as an unbiased technical consultant to correct equipment and/or operational issues. Moreover, the service should have the capability to provide a cost-benefit analysis of potential energy-efficiency initiatives, including equipment upgrades, to enable the owner to make informed purchasing decisions.

As it is often said, "knowledge is power." With increasing pressure for performance and energy savings from all quarters, ship owners and operators require unbiased performance analysis and insights from an onshore team of professionals to evaluate energy initiatives and optimize vessel performance under way.

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ReFRESCO

Understanding & Designing Energy Saving Devices

Bart Schuiling
is a researcher at the R&D department of MARIN.
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Using Computational Fluid Dynamics (CFD), new insights can be obtained into the working principles of Energy Saving Devices (ESDs), which all serve to increase the fuel efficiency of a ship. The advantages of using ReFRESCO to study ESDs are explored in this article. The capability of simulating different moving objects, and their interaction in on calculation (applying the so-called Sliding Interfaces Technique) has increased the range of applications of the viscousflow CFD code ReFRESCO. The new Sliding Interfaces Technique enables MARIN to study and reveal the oldest and perhaps the greatest mystery in the world of maritime propulsion: the reduction in fuel consumption when applying an ESD.

A Short Introduction to ESDs

The idea of saving energy by placing a device in front of the propeller was already published in 1949 by Van Lammeren, but the first commercial ESD was probably the Mitsui Integrated Duct Propeller (MIDP) introduced in 1980. Although the working principles responsible for the energy saving were not completely understood, in a world controlled by the second oil crisis, the MIDP was a great success. Shortly after, many other companies came with their own ESD designs. After the 80s, as the world economy recovered and oil prices dropped, interest in ESDs diminished. However, with the current challenging world economy, increasing oil prices and the upcoming new EEDI regulations, an ESD giving a possible 5% power savings gain becomes attractive to many ship owners.

Advantages of CFD

By using CFD, there is now the possibility to observe the effects of an ESD in a level of detail which is impossible when using only model tests (Figure 1). Another advantage of CFD is that the evaluation of many design variations, with small geometrical changes, is more cost efficient compared to model testing. Perhaps the greatest benefit of CFD is the possibility to evaluate the ESDs at full-scale Reynolds number. The performance of an ESD optimized during model tests can be severely reduced at full scale. It has often proven difficult to measure the large gains in efficiency that were found in the model tests during the sea trial. Since the possible gains of ESDs are in the order of 5%, CFD simulations have to be very accurate. To obtain accurate results, a fully verified and validated CFD code for ship and propeller flows, such as ReFRESCO [1] is a must.

Even with an accurate CFD code, achieving good quality results is challenging because the complex interactions between the propeller, hull and ESD make the CFD simulations extremely intricate. The geometries are complicated and care has to be taken when making simplifications and the quality of a computational grid has an important influence on the accuracy of a CFD calculation. Recent developments at MARIN facilitate the generation of high quality structured grids for propellers, without making concessions to the propeller geometry (see Figure 2). This results in a better iterative convergence and improves the accuracy of the calculation.

Additionally, time consuming unsteady calculations are needed to capture all interaction effects. This is only possible with the combined use of our in-house CFD code ReFRESCO (requiring no license fee) and our HPC clusters (maximum of 2,000 cores.)

MARIN participates in the European Union project Green Retrofitting through Improved Propulsion (GRIP). One of the main pillars of the project is to identify working principles of ESDs. Once working principles have been identified, new concept designs can be made, for example, the BSD concept design presented in Figure 3 and [2].

MARIN will continue to study and design ESDs in order to fully understand their underlying principles to enable it to give independent advice to clients on ESD performance predictions. In terms of CFD, accuracy (by decreasing the numerical uncertainties and by using finer turbulence models) and performance (by decreasing computational times) are the major areas of focus for the coming years.

Fig. 1

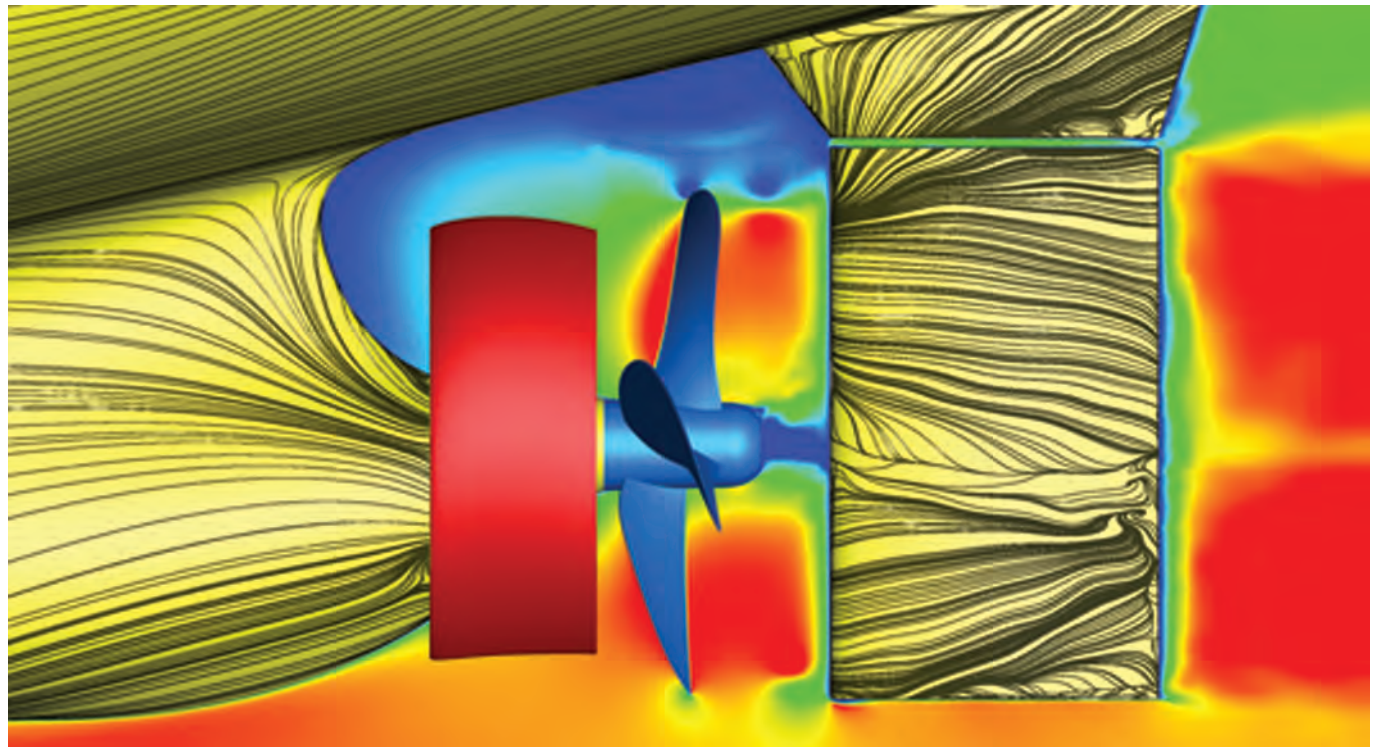


Fig. 2

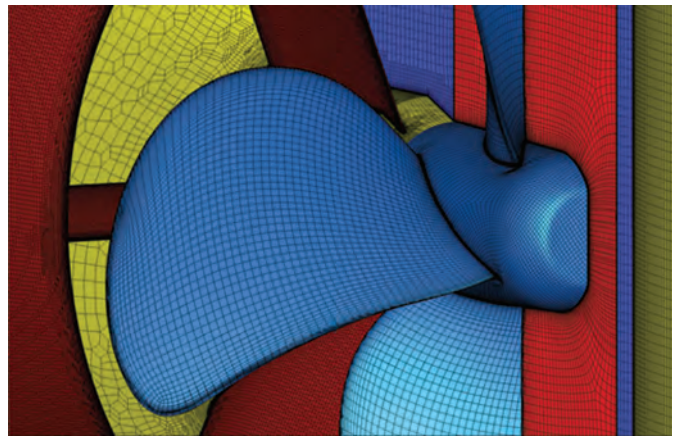
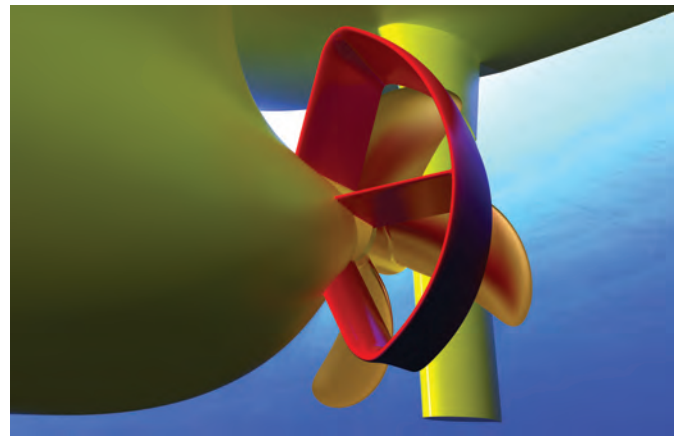
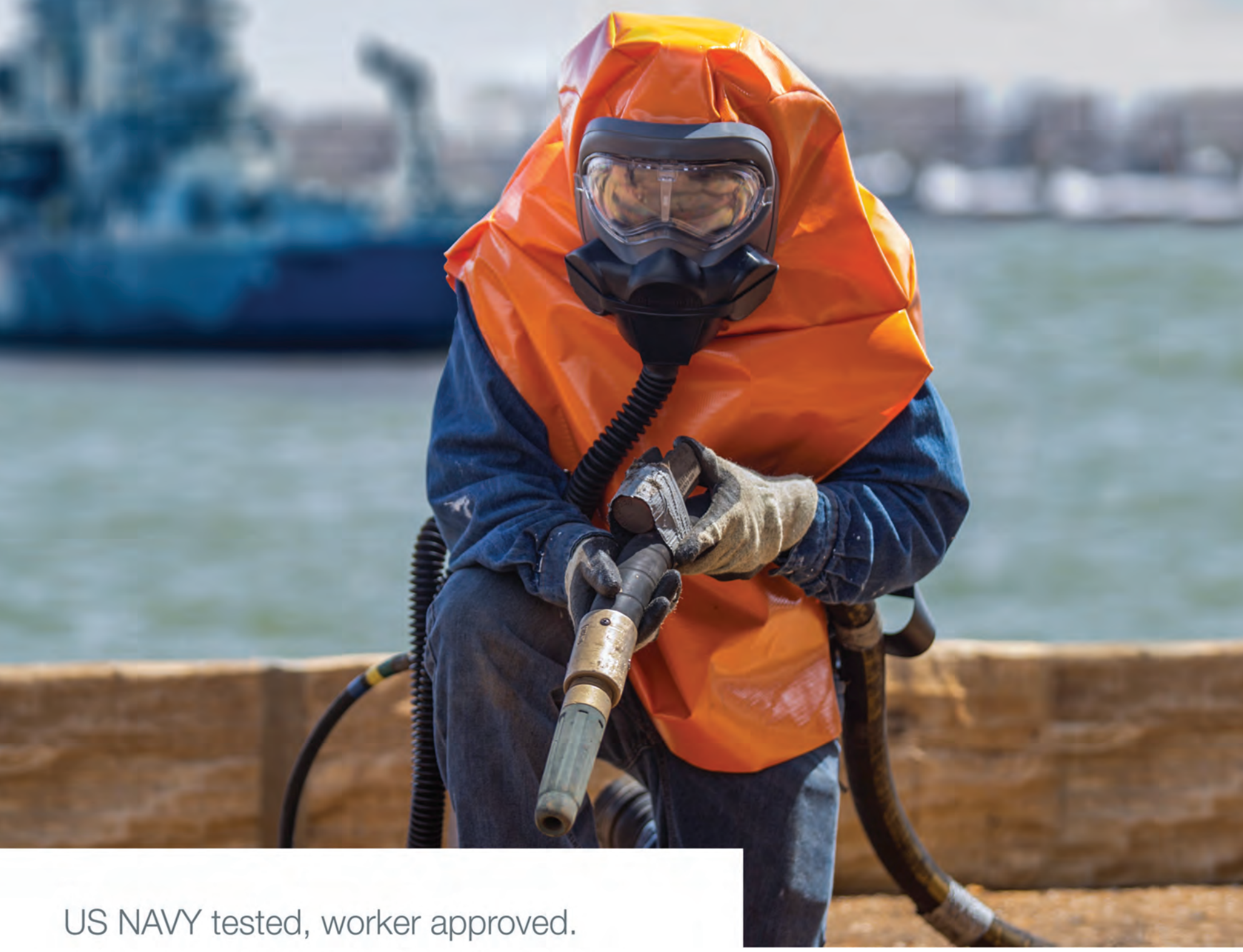


Fig. 3



[1] RIJPKEMA, D. and VAZ, G., "Viscous Flow Computations on Propulsors: Verification, Validation and Scale Effects," In Proc. Of Developments in Marine CFD, London, UK, March 2011

[2] SCHUILING, B. "The Design and Numerical Demonstrations of a New Energy Saving Device," NUTTS, September 2013.



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Nontank VRP Regs

The clock is ticking toward the deadline to submit to the U.S. Coast Guard an oil spill response plan that meets the requirements of the NTVRP regulation.

Dennis L. Bryant,
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(Photo courtesy T&T Salvage)

The long-awaited nontank vessel response plan (NTVRP) rulemaking was published on September 30, 2013 and came into effect on October 30, 2013. Neither of these are significant dates for the owners, operators, and masters of nontank vessels operating on the navigable waters of the United States. The truly significant date is January 30, 2014. This is the deadline for submittal to the US Coast Guard of an oil spill response plan that meets the requirements of the NTVRP regulation.

There are many good things about the NTVRP. Planning for oil spill response and preparation for an actual response effort are important and have been shown to ultimately reduce both the number and severity of oil spills.

Space limitations, though, prevent me from summarizing the details of this complex rulemaking. Instead, this article will have to focus on a few aspects of the rule where things have gone astray or there is room for improvement.

Wrapped Around the Axle

The Coast Guard has unfortunately gotten itself wrapped around the axle with regard to the geographic coverage of this regulation. Not inconsistently with the enabling legislation, the regulation states in new 33 CFR § 155.5015(a) that the NTVRP regulations apply to each self-propelled vessel that: (1) carries oil of any kind as fuel for main propulsion; (2) is not a tank vessel or is not certificated as a tank vessel; (3) operates upon the navigable waters of the United States, as defined in 46 U.S.C. 2101(17a); and (4) is 400 gross tons or more as measured under the convention measurement system in 46 U.S.C. 14302 or the regulatory measurement system of 46 U.S.C. 14502 for vessels not measured under 46 U.S.C. 14302. For this purpose, "navigable waters of the United States" means the territorial sea out to 12 nautical miles seaward of the baseline from which the territorial sea is measured and those internal waters subject to the ebb and flow of the tide and those non-tidal waters that either are historically navigable by interstate or foreign commerce or are navigable in fact.

The new NTVRP regulation then attempts to require that the oil spill response plans prepared for nontank vessels include response planning for waters in the offshore area and the open ocean area as defined in the original vessel response plan regulations. The original vessel response plan regulations were intended for use with regard to tank vessels.

The oil spill response plan requirement for tank vessels, as enacted in the Oil Pollution Act of 1990 (OPA 90), extended out to 200 nautical miles offshore. A vessel, other than a tank vessel, operating seaward of the navigable waters of the United States (as defined at 33 CFR § 155.5015(a)(3)), is just a vessel. By law, there is no such thing as a nontank vessel further offshore than 12 nautical miles. Therefore, the Coast Guard is acting outside its authority (i.e., in an ultra vires manner) when it purports to require nontank vessels (or at least foreign nontank vessels) to prepare and submit response plans that address a spill or the substantial threat of a spill that occurs more than 12 nautical miles offshore.

That said, it must be recognized that the owners and operators of all vessels (and facilities) from which oil is discharged without a permit are responsible under the law responding to that discharge if it occurs in waters subject to the jurisdiction of the United States, out to 200 nautical miles offshore. Only tank vessels are required by law to develop, implement, and submit for approval by the Coast Guard oil spill response plans for discharges more than 12 nautical miles offshore.

It behooves the owner or operator of a vessel other than a tank vessel to develop and implement a response plan covering discharges of oil more than 12 nautical miles offshore if the vessel regularly operates in waters more than 12 nautical miles offshore – but such a plan is not required by law.

Salvage and Marine Firefighting

The NTVRP regulations (and now the VRP regulations) include salvage and marine firefighting requirements. In this regard, the recent NTVRP rulemaking has wording that raises some questions.

The NTVRP regulation requires response plans for nontank vessels with a fuel capacity of 2,500 barrels or greater to "meet the salvage, emergency lightering, and marine firefighting requirements found in subpart I". Subpart I, the salvage and marine firefighting regulations, in defining the term "assessment of structural stability", requires that the assessment be consistent with the conditions set forth in 33 CFR § 155.240. This latter regulation requires, among other things, that vessel baseline strength and stability characteristics be pre-entered into a computerized, shore-based damage stability and residual structural strength calculation program. Numerous nontank vessels have not currently calculated their baseline strength and stability characteristics, let alone have those calculations pre-entered into a shore-based stability and strength calculation program.

If those characteristics were ever calculated, they generally have not been updated to account for changes and alterations made to the vessel. Thus, this regulatory requirement may impose an unanticipated burden on many owners and operators of covered nontank vessels. To make matters more confusing, new regulation 33 CFR § 155.5035(c)(11) provides that pre-entering of these characteristics is optional. Alternatively, the owner or operator of a nontank vessel may maintain ashore a copy of the vessel plans necessary to perform salvage, stability, and hull stress assessments. The Coast Guard may wish to clarify these provisions.

Nontank vessels with a fuel capacity of

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Maurice Denis
Regional Manager, Americas, SVITZER Salvage

less than 2,500 barrels but greater than or equal to 250 barrels are not required to have salvage and marine firefighting contracts, but must plan for and identify salvage, emergency lightering, and marine firefighting resources and include in their plans a written consent for plan listing from the recognized response resource provider. In the NTVRP preamble, it states, in pertinent part, that the owners and operators of these nontank vessels must provide those resource providers with a copy of the nontank vessel's pre-fire plan. The resource provider must agree that the pre-fire plan is acceptable and agree to implement it to mitigate a potential or actual fire. This language in the preamble seeks to impose a requirement that is not found in the actual rule.

Foreign Vessel Not in Innocent Passage

The NTVRP regulation clearly and correctly states that it is not applicable to a foreign-flag vessel engaged in innocent passage through the territorial sea or transit passage through a strait used for international navigation, unless that vessel is bound for or departing from a port or place of the United States. There is no mention, though, in the rulemaking about two specific geographic areas where this legalistic approach will create friction – the Great Lakes and the Strait of Juan de Fuca.

Waters of the Great Lakes are internal to the United States and Canada and the boundary in those Lakes is specifically defined. Because waters of the Great Lakes are internal, there is no right of innocent passage. A Canadian flag vessel operating on the US side of the Great Lakes boundary is required by US law and regulation to have a NTVRP (unless the two nations agree to an alternative approach). Likewise, a non-Canadian foreign vessel calling at a Canadian port in the Great Lakes is required to have a NTVRP, since it is physically impossible to enter the Great Lakes from the sea without going through some US waters.

With regard to the Strait of Juan de Fuca, the United States has long taken the position that the status of those waters is unique (i.e., sui generis) and that neither the concept of innocent passage nor the concept of transit passage applies. Thus, any nontank vessel bound to or from a port or place in British Columbia via the Strait of Juan de Fuca will be required to have a NTVRP if it operates on the US side of the international boundary. Since the US-Canada Cooperative Vessel Traffic Service for the Strait requires vessels in-bound through the Strait to stay on the south (US) side of that waterway, there is almost no way to avoid this situation.

A similar conundrum was encountered with regard to the US tank vessel response plan regulations in 1993. At that time (as I recall), the two nations agreed that their response plan requirements were functionally equivalent and vessels that compiled with Canadian response plan requirements were considered by the US Coast Guard to be in compliance with US VRP requirements. The same may not hold true now. The US has included such requirements as salvage and marine firefighting in its response plan regulations – requirements that are not included in the Canadian regulations. Thus, questions must be raised regarding vessels transiting US waters of the Great Lakes and the Strait of Juan de Fuca without a valid US NTVRP.

Conclusion

With the exceptions noted above, the new NTVRP regulation greatly improves the response readiness of nontank vessels with respect to oil spills in the navigable waters of the United States. Experience with tank vessels also shows that oil spill response planning helps to reduce the frequency and volume of oil spills. As the tanker industry learned, prevention is a lot less expensive than attempting to clean up afterwards.

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This is the second in a series of Maritime Reporter and Engineering News articles on Safety Culture in the maritime industry. The first article, which appeared in our October, 2013 edition, discussed the importance of management leadership, training, measurement, a focus on learning rather than blame, and continuous reflection on safety. In this second article, safety culture expert Captain John Wright discusses the key ingredients of a healthy safety culture.

Talking with the Expert

I had the good fortune of meeting Captain Wright because of his involvement with the BC Ferries SailSafe project. SailSafe is a multi-phased project aimed at creating an industry-leading safety culture (and safety record) at BC Ferries. It is a project that the company I work for, Marine Learning Systems, is fortunate and proud to be a part of. SailSafe has seen time loss injuries cut in half, serious injuries reduced by two-thirds, and annual insurance claims costs reduced by over three-quarters. And the numbers continue to improve.

Captain Wright is a Master Mariner and has spent his long career in the maritime industry in a variety of roles including those of vessel master, marine superintendent, chief executive and general manager. All of John's roles have had a focus on safety and cultural change. He holds a wide variety of certificates and qualifications concerning health and safety, risk management and safety technology.

In June, 2013, John was honored with a safety at sea award for training which recognizes innovation and excellence in the maritime safety industry.

I asked Captain Wright a number of questions about implementing a healthy safety culture:

Please start us off with a high-level overview of how a company can improve its safety culture?

The very best way to improve a safety culture, which means improve absolutely everything in the business, is achieved when a company decides to properly ask their employees this question in a structured way:

"What's wrong and how can we fix it?"

Employees are rarely asked that question and when they are, their brilliant and often simple ideas end up on some poor hapless, overstretched manager's desk, who is forced to put it in the 'too difficult' tray. The net result is an already demotivated employee becoming even more demotivated.

The answer, instead, is real workforce involvement and ownership of their own ideas. People are endlessly supportive of their own ideas. By allowing employees to implement their ideas for themselves, an organisation puts the enormous workforce 'horsepower' (which is otherwise underutilized), onto the 'propeller shaft'. This results in:

- Reduced loss events (for ex., injuries and damage to equipment),
- Reduced turnover of personnel,
- Reduced training and re-training costs,
- Reduced sickness absence, and
- An increase in motivation, involvement, enthusiasm, communication, teamwork and quality of decision making.

For management, what is the biggest indicator that they can look for in their company to determine whether they have a safety and culture problem - before an accident occurs?

The most important of all is how well accidents, incidents and near misses (which we prefer to call 'learning events') are reported, acted upon and learned from. Under-reporting common and is a solid and reliable indicator. Another is how often directors, managers and front-line supervisors visit their people at their place of work, and how well they communicate with them. Is the communication conducted in a, 'I speak, you listen' way, or is it a conversation seeking the employees ideas on what's wrong and how they think it can be fixed (which, by the way, they always know)? The quality of these conversations is critical and yet managers are rarely given any help with developing these communication skills - skills which will not occur spontaneously. Another clue to the culture is when training is the first thing to be cut when business is poor - it should be the absolute last thing that is axed.

Captain John Wright is a Master Mariner and has spent his career in a variety of roles including those of vessel master, marine superintendent, chief executive and GM.

If you had to say, what is the one most important ingredient in culture change?

The quality of leadership from the top: The knowledge and commitment from the leadership team, their abilities as leaders to inspire their people and demonstrate their belief in the process, and their ability to prove (by their actions) to the most complete cynic in the workforce that they are genuinely putting the health, safety and welfare of their people as their number one priority.

What is the biggest challenge to positive culture change?

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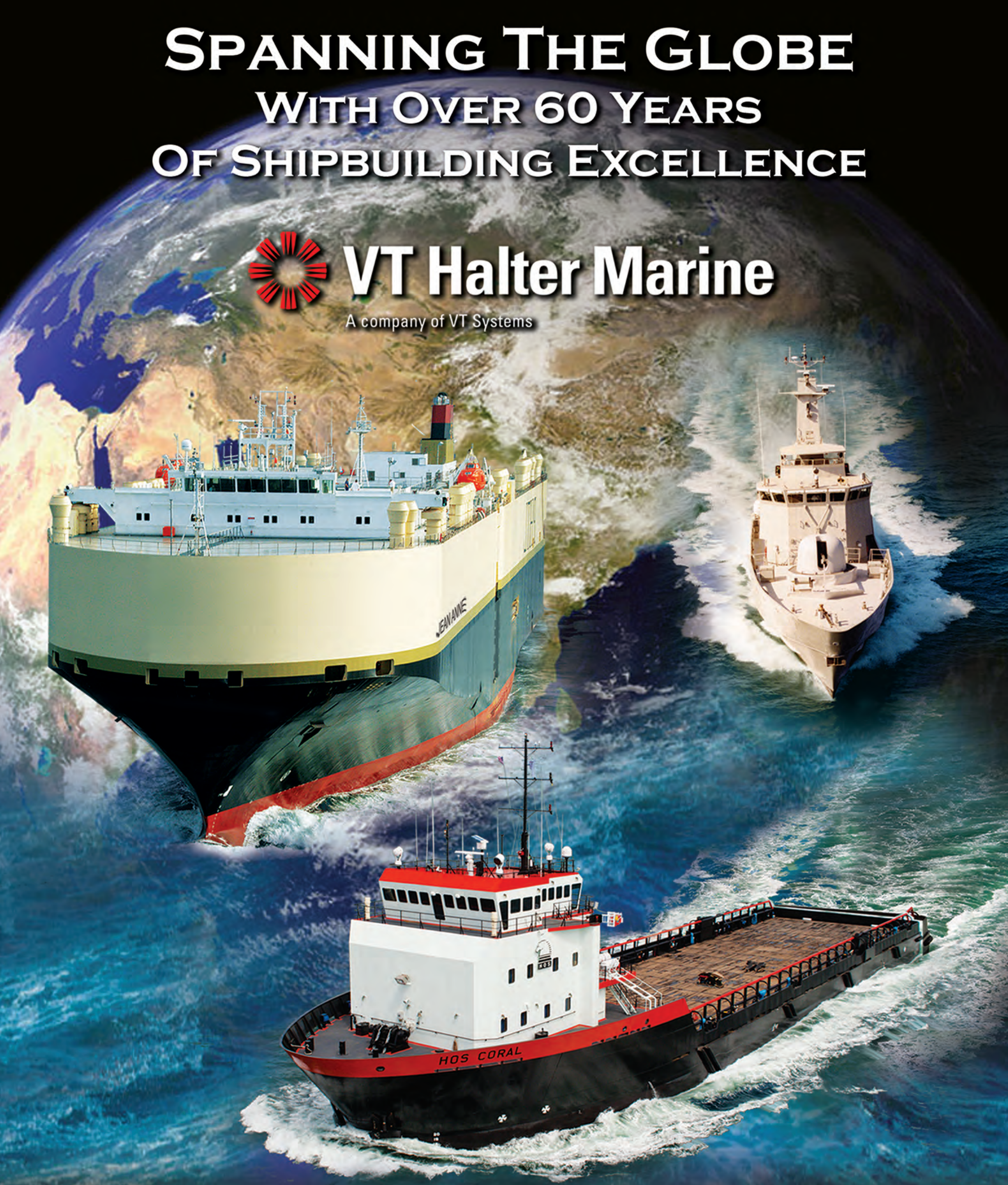

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"What's wrong and how can we fix it?"

Employees are rarely asked that question and when they are, their brilliant and often simple ideas end up on some poor hapless, overstretched manager's desk, who is forced to put it in the 'too difficult' tray.

shipping these are the superintendents ashore and the captains and chief engineers on the ships. Once the Board of Directors are committed to the process and the front line employees begin to recognise what is being attempted, then the main challenge is to convince these critical middle management employees of the need for this process and the need for them to change. They need to change from the 'I speak, you listen' command and control style of management, to the 'How can I help you and how can I support you?' method. They also need to be comfortable and empowered to ask their boss for help and support. This does not occur spontaneously! This is where the STCW 2010 mandated Human Element Leadership & Management (HELM) training becomes essential.

How do the attitudes and behaviors of individuals relate to safety and culture change?

This question encompasses why culture change is a 5 to 10 year 'voyage'. The 'battleground' is to change the collective attitudes, beliefs and values of the employees, since it is they that drive behaviours. It takes time for employees to understand that the company is serious about the process and that this initiative will not just be a passing 'flavour of the month'. Once this occurs, usually after about a year or so, the 80 / 20 rule kicks in and 80% of the committed employees drag most of the other 20% along. In many cases the few remaining disenfranchised will leave. It is usual to expect that when people who are influencers in the company (and may often be early cynics) embrace the necessary changes of behaviour, they carry many others with him."

Aside from attitudes, what are the most important factors of the human element that most companies need to address?

The first is standards of competence and the training needed to ensure those competencies. This includes especially (but not exclusively) human factor, leadership & management skills.

All training needs to be validated, that is, it must be proven to be delivering at the sharp end and not just recorded in a tick box, which is so common and means nothing. The second is to ensure Standard Operating and Emergency Procedures are introduced and above all owned by the end users. This means employee involvement in their construction, who in turn will ensure they are simple, brief, relevant, updated and vessel / work area specific. The same workforce involvement needs to be embraced in areas such as the management of maintenance, design, choice of equipment purchased, ensuring effective closed loop communications, decision-making & a useful modern 360 appraisal system.

Is this change expensive?

The answer to this question is that oft quoted saying, "If you think safety is expensive, try an accident!" But even ignoring accidents, improved safety culture improves all aspects of operations.

One company found nearly $40M in savings from the process over a five year period and another turned a $7.5 M profit into $150M over a seven year period. There is nothing a company can do that is more productive. And more importantly, everyone goes home to their loved ones in one piece: Money can't buy that level of job satisfaction!"

There are many important takeaways from our discussion with Captain Wright.

- *Culture change takes time, but it is achievable.*
- *It requires that we expose errors and turn them into learning opportunities.*
- *It requires real leadership (and participation) to make it happen.*
- *It not only saves lives and prevents injuries, but it can be exceptionally good for the bottom line.*

If you are not sold on the importance and accessibility of safety culture transformation, visit a vessel operator that has successfully undergone one. There is no better way to understand how powerful it can be. Most that have already undergone such a transformation will be very willing to receive you and tell their story - that's just part of the culture. You will find the visit very compelling - I guarantee it.

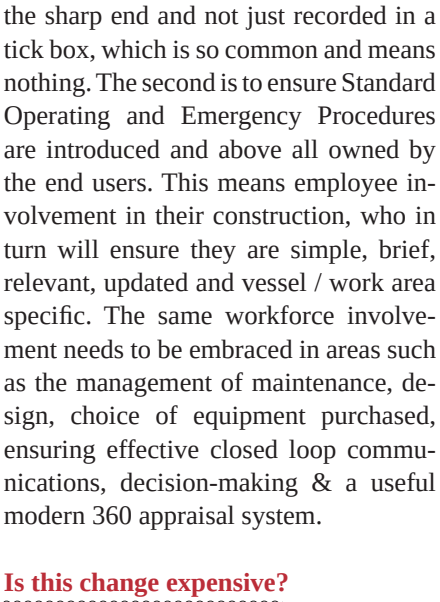

Photo by Chris Oxley

Newport News Installs 30-Ton Propellers

Lindell Toombs, a Newport News shipbuilder with 41 years of experience, applies a protective coating to one of the four propellers on the aircraft carrier Gerald R. Ford.

e-Compliance

Revolutionizing the Efficiency of Compliance for Maritime Regs

Philipp Lohrmann
studied physics at the University of Bonn, Germany. He received his PhD in Applied Mathematics from Kings College London in 2007. Since joining BMT Group's R&D team in 2010, he has been working on several European research projects on ship safety, robotics and supply chain security.
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Commercial seaborne shipping is regulated by international, EU and national authorities and is subject to a number of commercially oriented constraints. The long history and large number of organizations associated with regulation has led to a high level of complexity in managing the development of regulations, their implementation by transport operators, and their enforcement by authorities. The complexity of the situation is further aggravated by the long lifetime of ships, the different phases of ship operations, the number of parties in the operation and the interests of other stakeholders.

From a business perspective, shipping companies spend a large amount of resources collecting new and updated regulations each year. In addition to the cost, they often remain unsure that their system is up-to-date and that authorities in different ports agree with their interpretation of the regulations.

e-Compliance, a project launched recently by the European Commission, aims to unify regulatory information available to stakeholders, co-ordinate regulatory actions and as a consequence, reduce the burden of multiple regulatory sources. For this purpose, it will utilise semantic technologies to produce machine-readable regulations within an electronically accessible Maritime Regulations Digital Library. It will incorporate over 10,000 Regulations, covering at least five different areas, including safety, environment, piloting, waste etc. This will cover regulations from at least five different sources including Europe, Ports, Classification, Maritime Authorities and the IMO.

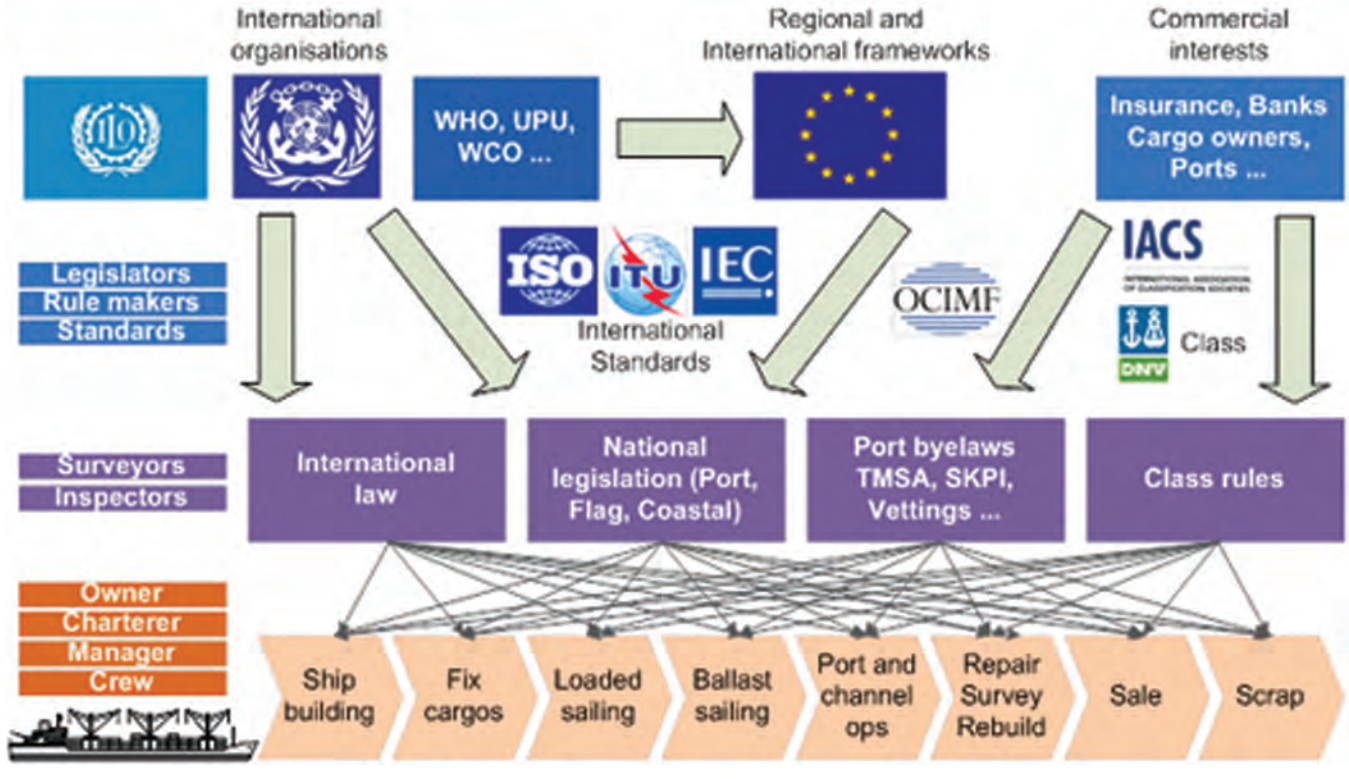
e-Compliance will build on a number of previous European Research projects and private initiatives. The FLAGSHIP project demonstrated a considerable simplification in the management of maritime regulations on board a ship which was based on an advanced semantic search mechanism applied on selected sets of rules and regulations. Furthermore, the MARNIS project specified all EU directives and interrelations/information flows, the SKEMA project investigated the eMaritime application to regulations management and the e-Freight project has developed a prototype Next Generation Single Window dealing specifically with the new Ship Formalities directive.

The e-Compliance project will also seek to integrate other private initiatives into the framework. This includes voluntary systems such as Tanker Management and Self-Assessment (TMSA) and Shipping KPI (SKPI), as well as vetting systems and ship classification regimes. All developments will complement and be kept closely aligned with the e-Maritime programme and particularly the eMAR project.

Specific activities within the project will include the establishment of a cooperation model between regulation setting and enforcement authorities, both for port state control and IMO regulations, for modelling and interpreting regulations and ensuring harmonisation across national and organisational boundaries. The resulting seamless co-operation between the different stakeholder groups will improve the effectiveness of regulations and reduce the burden on practitioners who work with maritime regulations on a daily basis.

Demonstration of automated compliance management will be possible through the modelling and delivery of regulations in electronic format, as well as harmonised e-Services for more effective and co-ordinated enforcement controls and inspections. In addition, e-Services in support of class requirements, particularly on surveys and for ship risk management in upgraded e-Maritime applications, will be used. An evaluation of the practical implementation of the above in representative networks and the provision of recommendations for e-Maritime policies will also be undertaken. To this end, the project will create virtual systems which address the specific needs of stakeholders. For the port community a feasibility study and business case analysis will be carried out to look at the possible integration of Port Community Systems (PCS) and National Single Windows. The vision is to create one virtual port of Europe for the sharing of compliance data and logistics information. This activity will consider the different stakeholder requirements, identify potential barriers and demonstrate the benefits of sharing compliance data via PCS. The analysis will also take into account the role of smaller ports that do not currently have a PCS and advise on how these ports can be integrated into a wider European virtual port system. Consultation with the European Port Community Systems Association will play a key role in supporting this activity. Once developed, the system will be tested in more detail for the ports of Barcelona and Marseille in particular, using the port of Rotterdam for validation. The main stakeholders that will benefit from such a system will be the declaring

The Quagmire of Maritime Regulations



parties and the enforcers. The principal advantage for the declaring parties is the fact that the information required to enter EU ports will only need to be submitted once. Enforcers on the other hand will benefit because sharing information on inspection and checks between ports will lead to fewer checks being needed in subsequent ports.

Furthermore, to address the needs of the ship owners and operators who must comply with regulations, a virtual ship system will be created. This will include the development of automated compliance checking using real ship and freight data to inform the crew of any issues of non-compliance, as well as tasks which must be undertaken in order to comply with regulations. A forms system will be developed to aid ship operators with the completion of required documentation. This information will then be sent to the port system where it can be validated and the ship operator can be kept up to date about the current status of the form.

Finally, the virtual class system will be a tool for class, port state control and (potentially) private parties to assess the state of the ship's systems, including management, to link actual performance with relevant rules and legislation. This system will be further integrated with the virtual ship and port systems to provide the following services:

- Identify the KPIs and measurements that are linked to selected regulations or specific (safety or security) objectives and who is responsible for collection and quality control.
- Collect available data for a specific ship for these objectives and rules. The data will be collated into a scorecard that will also include reliability measures to highlight the relevance of the scorecard.

By integrating information that is already collected by Shipping KPIs, the Oil Companies International Marine Forum and other organisations that are willing to provide such data on the ship owner or manager's behalf, this system will provide an innovative and efficient approach to documenting good quality management procedures, resulting in higher quality technical and operational systems. This in turn could make enforcement more efficient and reduce interruptions for ships when complying with regulations and other voluntary reporting.

e-Compliance is a three year research project and is co-funded by EC's DG MOVE and maritime regulatory stakeholders. The project's consortium comprises representatives of the three main stakeholder groups involved: classification societies (who create class rules), port state control (who enforce regulations) and ships (who need to comply with regulations). It consists of 10 partners, all of which bring their own areas of knowledge and experience of working in the maritime space. They include:

- BMT Group Ltd.
- Det Norske Veritas (DNV)
- Danaos Shipping Co Ltd.
- INLECOM Systems
- The Netherlands Organization for Applied Scientific Research (TNO)
- TEMIS, Acciona Infraestructuras
- PORTIC Barcelona
- Norsk Marinteknisk Forskningsinstitutt AS (MARINTEK) and
- The Maritime Administration of Latvia.

Pull the Handle Down...

One of the most effective and easiest fuel reduction operations is reducing the engine power by reducing the speed of a vessel.

By Peter Pospiech, Dipl.-Ing., Germany

(Photo: MAN Diesel&Turbo)

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Out of the total operational costs of a vessel, fuel costs account for, by far, the highest proportion.

When fuel prices soared, the technical experts of one of the world's biggest shipping companies set about to solve the problem, and slowing down was the solution they devised.

By 2009 significant fuel savings resulted from sailing its ships at 12 knots instead of 24, and "Slow Steaming" officially became the standard operating procedure in their fleet. Meanwhile, today, it is standard in almost all existing shipping companies, as shipowners for the past five years have simultaneously battled reduced freight rates and rising fuel costs.

In addition to the fuel benefits, there is also reduced greenhouse gas (GHG) emissions, absorption of excess fleet capacity and increased schedule reliability.

You Say Slow Steaming, I Say Low-Load

While marine engine manufacturers such as MAN and Wärtsilä describe their operation mode as "Low-Load Operation," shipping companies are talking about "Slow Steaming."

Slow steaming refers to the practice of operating transoceanic cargo vessels, especially container vessels, at significantly less than their maximum speed. According to Maersk Line, which introduced the practice in early 2009 because of the worldwide financial crisis in 2008, slow steaming was conducted at 18 knots. Vessel speeds of 14 to 16 knots were used on Asia-Europe backhaul routes in 2010. Speeds of 12 to 14 knots were called "Super Slow Steaming."

In the early days of slow steaming operation, mainly container vessel operators requested to operate at low loads. Today, shipping companies featuring tankers, bulkers, and a variety of ship types, are operating continuously at low load, but with a high degree of flexibility in terms of vessel speed.

Vessels, which have been built before the crisis took place, were already designed to enjoy enormous fuel savings and economies of scale. For example, the large container vessel Emma Maersk saves around 4,000 million tons fuel on a Europe to Singapore voyage, simply by pulling the handle down. At a typical $600-700 per ton, this results in around $2.4 to $2.8 million fuel cost saving on a typical one-way voyage. Particularly amazing, as these ships were not originally designed for slow steaming.

With this came pressure to the engine manufacturers.

"We at NSB have incorporated slow steaming and later on super slow steaming," said **Jörg Erdtmann** (above) Head of Engine Operation Department (EOD). Actually NSB has had the policy in effect since 2006.

Below: A typical NSB 6,500 TEU vessel of NSB.

(Photo: NSB Shipping)

Ships are not still

So why are bilge water treatment systems static?

Traditional bilge water treatment systems rely on gravity, filters or flocculation chemicals to achieve 15 ppm. But while they may pass type approval tests in stable conditions on shore, these static technologies seldom perform at sea.

Because in real life, the ocean is anything but stable.

In a pitching and rolling environment, only a dynamic system like Alfa Laval's PureBilge offers continuous bilge water treatment. PureBilge uses centrifugal separation – the same technology trusted to protect your engine – to handle varying bilge water feed and the toughest emulsions.

The result is less filter waste and reject. Not to mention less time in the engine room.

PureBilge – a dynamic force in bilge water treatment

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(Photo: MAN Diesel&Turbo)

Stig Baungaard Jakobsen, MAN's Senior Manager Operation Dept., said: "In late 2008 we were able to operate our new developments with continuous low-load operation down to 40% load, and in May 2009 we were ready to support continuous low-load operation down to 10% load."

They were tasked to ensure a reliable and a long operating engine. But overall, they were well prepared, as MAN's Senior Manager Operation Dept. Stig Baungaard Jakobsen explained: "In late 2008 we were able to operate our new developments with continuous low-load operation down to 40% load, and in May 2009 we were ready to support continuous low-load operation down to 10% load. Nearly all service experience with this mode since than has been positive."

And Christian Ludwig, Senior Manager Retrofit & Upgrade said, "(Important for this success was) the application of the standard fuel injection valves of the slide valve type. Slide-type fuel valves significantly reduce fouling of exhaust gas ways, especially when operating at low-speed and should be retrofitted on older engines which are not equipped with slide fuel valves from the outset."

Jakobsen said, "Soon after it became normal to operate at extremely low loads, the request to optimize running at low load surfaced." At MAN it supported this in two ways:

- increase the scavenging air pressure at low and part loads, and
- reduce the cylinder oil feed rate at low load.

"Most elegantly, this was supported on the electro-hydraulically controlled ME-engines," Jakobsen said. "The ME engine control system (ECS) is designed to control variable turbine area (VTA) turbochargers, exhaust gas bypasses (EGBs) and flexible turbocharger cut-out systems."

Christian Ludwig added, "For engines in service, the flexible turbocharger cut-out system with control of so-called 'swing gate valves' has become a retrofit solution applied in many cases on engines with two, three or four turbochargers. For a big-bore MAN engine of type 12K98MC operated at average 40% load, yearly savings on fuel costs by applying turbocharger cut-out amounts to approximately $1 million." Ludwig added, "Today optimization of the cylinder oil feed rate at low load is important. The MAN Alpha Lubrication System has been further developed for MC and MC-C engines with the aim of more accurate feed rate control in the low load operation area. To cut it short: all running Alpha Lub Systems on MC and MC-C engines could benefit from upgrading the Alpha Lub System."

"Currently we are introducing our solution for avoiding cylinder liner cold corrosion in turbocharger cut-out mode with modified jacket cooling water bypass. With this system, normally up to 75% of the jacket cooling water will bypassing the cylinder liner cooling bores," said Jakobsen.

From the Operator Point of View

NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, Buxtehude (REEDEREI NSB) is one of the leading containership managing owners in the world. With a fleet of 85 vessels (76 container vessels) the company, which was founded in 1982, provides quality "Made in Germany."

Apart from the ship management of containerships, tankers and offshore jack-up vessels, REEDEREI NSB is supervising new-buildings and is active in crewing of both its own ships as well as vessels of other parties. At its own NS-Bacademy, which employs a modern Ship-Handling-Simulator, employees from ashore and seafarers are trained and educated on a regular basis. In its headquarters in Buxtehude and its branches in the United States, Korea and Singapore, REEDEREI NSB employs approximately 250 men and women and 3,000 seafarers. Maritime Reporter & Engineering News editor Peter Pospiech had the opportunity to talk to Jörg Erdtmann, Head of Engine Operation Department (EOD), about the company experiences of Super Slow Steaming. NSB features MAN and Wärtsilä engines as well.

"We at NSB have incorporated slow steaming and later on super slow steaming actually already in early 2006," said Erdtmann. "A significant measure aimed at reducing costs in the daily operation of our vessels is Super Slow Steaming, in which the main engine runs at only a very low load (10-45%). The impacts upon fuel consumption are enormous, as has been proven by the actual measurement data of an NSB vessel of the 6,500-TEU class:

According to these measurements, a reduction of speed from 25 to 12 knots results in a reduction of fuel consumption from 246 to 35 tons of heavy oil per day – this corresponds to a reduction of almost 85% at half-speed. Considering the actual fuel price, we are using mainly RMK 500 and 700 on all our vessels, of around $600 per ton our charterer could save around $126,000 per day! On the other hand the fuel prices were rising enormous and more ships were required to continue weekly departures".

"However, negative consequences of Super Slow Steaming must also be taken into consideration: since ship's engines designed before the rapid increase in fuel prices and the beginning of the world economic crisis and had not been designed for operation at only 10-45% of the engine's actual power, operation at such low levels may lead to damages. Our most experienced frequent problems are:

- Failure of the auxiliary fans
- Over-lubrication
- Accumulation of soot in the engine
- Cold corrosion

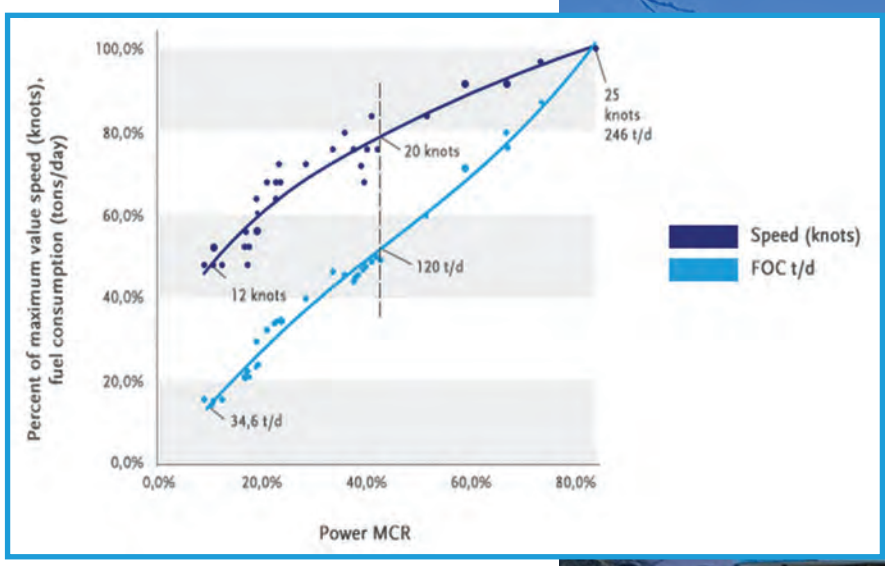
In order to combat these problems, EOD has developed a number of measures:

- Modifications of the main engine auxiliary blowers
- Conversion of the cylinder lubrication system to slow speeds
- Fitting of dynamic turbo charger cut-out systems

The overall effect achieved by all of this is that it will permit the main engines on board our vessels to be operated both

(Photo: MAN Diesel&Turbo)

Christian Ludwig, Senior Manager Retrofit & Upgrade said, "With the application of the standard fuel injection valves of the slide valve type, this was very important for this success."



Actual measurement data of an NSB vessel of the 6,500 TEU class.

(Photo: NSB Shipping)

very economically and at the same time in a manner that is safe and as gentle on the materials as possible.

"Not to forget, and this is very important, we are working closely with the engine manufacturers to solve the problems," Erdtmann said. "But vessels speed reduction is not all to improve the efficiency of our ships. We are using a number of other subjects as well, such as trim optimization software, modern weather routing software, propeller adaptation to the reduced speed of the vessels, special anti-fouling coating for the hull, an adapted bulbous bow and other things as well." According to Erdtmann a number of things have occurred because of the enormous speed reduction. Many individual measures were initiated and implemented so that the NSB-ships could be operated efficiently in the long term in this Super Slow Steaming area, which was actually intended only for operations on rivers.

- Initially, damages were caused to the main engine auxiliary fans. Countermeasures were immediately initiated: spare fans were procured and these were equipped with special seals and bearings.
- Scavenging air-duct-check-valves require alert crew
- Increased cleaning requirement for turbocharger nozzle rings and exhaust gas boiler plants
- Installation of flexible turbocharger in ongoing vessel operation
- Precautionary measures against engine overloading

Erdtmann summarized: "But at the end of the day we can say that Super Slow Steaming is a very worthwhile measure to be competitive for now and also in the future"

At 65 feet long, the 'Viscountess Bury" was the largest electric launch to ply the River Thames. In 1910 her electric engine was replaced with an internal combustion engine.

Return of the Electric Boat

By Tyson Bottenus

In the 1880s it was possible to cruise your way around London by an electric ferry on the River Thames. At its height, the river carried 13 launches, each measuring 28 ft. long. They glided along at five knots and had a range of about 60 miles.

Each launch carried one ton of storage batteries hidden underneath the passenger seats. Charging stations were even placed along the river so these electric launches could continue up and down unhindered.

An article in Scientific American from 1883 praised the effortlessness they imbued: "the operation of an electric launch is the ideal of ease and simplicity. It consists, practically, of turning a switch and – letting her go."

Designed initially by Gustave Trouve one year before, the first electric boats came complete with a headlamp and a horn. But the electric boats on the River Thames were bigger. In addition, they were also quiet, more spacious and cleaner than their competition - the steam powered ferry. "[Electric] launches are chiefly wanted in the summer when the heat and smoke, smell, oil, and dirt of a steam launch are objectionable," one magazine reported. But as soon as they came to existence, they disappeared only a decade later – replaced by the advent of the internal combustion engine. Over a hundred years later, however, it seems electric boats are making their resurgence. This time will they stay?

The Return

Newport, Rhode Island is known for its grandiose sailboats and motoryachts, and the Newport Boat Show is a yearly landmark for enthusiasts asking the question, what's next? The end-of-the-summer event brings dealers and customers from around the world together.

For most, it's not their first time attending and the selection doesn't change much year-to-year. On one side, you have sailboats – on the other, powerboats. But this year featured two companies who have never been to the Show before. And they were introducing something that few people had ever seen.

Enter the eCraft 20, a sleek open-transom day cruiser operated by a joystick that comfortably seats eight people.

"The whole design of the boat came from the fact that there's no outboard motor and no inboard box," said Rogan Van Gruisen of eCraft Yachts, "meaning we can create this wide open-transom design." Van Gruisen, a native Newporter who studied yacht design in England, teamed up with esteemed naval architect Matt Smith to create the eCraft 20, an all-electric powerboat that can cruise at maximum speeds up to 8 kts. and easily go 30 nautical miles at its cruising speed of 5 kts.

"You're not storing any fuel, you're not spilling any fuel," Rogan said. "The fact that you're traveling silently is pretty amazing. And the cost benefits: it's really cheap. We figured out that it's about $1 of electricity to fully charge the battery. That's the equivalent of what, $40 of gas if you're motoring around all day?"

The eCraft 20 was designed for the weekend powerboater who wants a craft that can take him anywhere in the bay. But what if you wanted to extend your range just a little farther? Or perhaps go a bit faster? \We spoke with Constantine Constantinou of Greenline about the Greenline 33, which happened to be parked just a few feet away from the

Top

Across the world recharge stations appear for electric cars. Will the trend continue for electric boats?

Middle

The all-electric eCraft20. With 12 hours of battery life, this boat is perfect for cocktail cruising, picnicking and fishing on a small bay.

Bottom

If longer travel is in your plans, the Greenline 33 is the largest hybrid powerboat on the market today.

eCraft 20 that day.

"There's a few electric boats out there," Constantinou said. "But they're smaller for the most part. We have the largest available electric/hybrid boat out there."

The Greenline 33, of which over 300 have been manufactured so far, has a range of over 700 nautical miles with a cruising speed of seven knots. Because of its specially designed "superdisplacement" hull, it creates less wake. Combined with a solar paneled roof that can recharge the ship's battery over the course of an entire day, the Greenline 33 offers a completely unique way to travel on the water.

Constantinou weighed in on the challenges electric and hybrid boats face. "The only problem I can think of that might be an issue is for the market to see these boats as functional and reliable. When Seaway [who owns Greenline] came up with this concept in 2009, it was right at the beginning of the economic crisis."

"Everybody was gun-shy. They didn't want to consider any new products. But Seaway thought that the product was so compelling. It was something new. They placed their faith in the product and since then the boats have received over 20 international awards for innovation and environmental friendliness. We have now over 400 boats that have been built in the last two and a half years. It's a great success story."

This success story that Constantinou talks about is one that's been in the works for over 100 years now. When electric launches came on the scene in the 1880s, the promise this technology offered seemed poised to explode.

"Electrical power for river launches is now an established fact on the Thames and will probably be much improved in the coming years," claimed Scientific American.

There was talk of adding more charging stations along the river to accommodate for the increased demand of electric boats. Three years after the first launches on the river Thames, one million visitors to the 1893 Chicago World's Fair were transported via electric boat.

But it was the World's Fair, surprisingly enough, that also spelled the fall of the electric boat. And, coincidentally, the rise of the internal combustion engine.

A Petroleum Boat

First and foremost, William Steinway was a piano craftsman.

But in the 1880s, he was also the financier who brought the petroleum-based internal combustion engine into the limelight when he met Gottlieb Daimler on a quest to Europe for ideas. Stein-

way purchased a trolley car powered by Daimler's new engine and the manufacturing rights to any Daimler products in the United States for a whopping sum of $10,000.

Steinway, who initially planned to use the "horse-less trolley" to transport pianos, quickly saw the potential for the engine to be used in the marine environment. He had a Daimler internal combustion engine launch built and transported to the World's Fair for the masses to see.

In October of 1893, just weeks before the end of the Fair, a dory capsized in the cold Lake Michigan waters. It's described that three boats were sent out to the rescue: a lifeboat powered by sailors on the battleship Illinois, a naphtha-powered launch, and William Steinway's one-of-a-kind internal combustion engine launch.

The vessel on the scene first was Steinway's launch. Described as a "miracle for speed", the boat travelled 15 kts. to the rescue. The first petroleum powered boat saved the capsized sailors and Chicago newspapers announced to the world that Gottlieb Daimler had created the first high-speed engine.

"Nothing can explode," the newspapers reported later about the internal combustion system. After Steinway passed away, Daimler Motor Group was sold to General Electric and eventually became famous for the "Mercedez" engine. Daimler stayed with cars but the quest to create a better petroleum-based motorboat was on.

The electronic launch was out. Internal combustion was in. They simply traveled farther and faster.

The Future

More than 100 years later, it seems as if the tides may be turning for the electric boat.

In October 2013, the world saw the first ever electric/hybrid boat convention held in Nice, France. Aptly named "PlugBoat", the conference drew in 70 delegates from over 14 countries in an effort to connect industry, R&D, and non-governmental organizations.

"It emerges that, although small in comparison to electric automobiles, battery-electric boats and hybrid-electric boats are making steady and very positive progress across Europe," summarized Kevin Desmond, a representative for the PlugBoat conference. Torqueedo, who made headlines recently with the introduction of an 80 HP and 40 HP electric outboard motors, sponsored the weekend-long event.

"Given the significant output of the automobile manufacturers and the steady and unprecedented rise in electric car sales," said Desmond, "the worldwide electric boat fleet will continue to grow to a point where there will eventually be more electric boats than [boats powered by internal combustion engines]."

In his talk addressed to the delegates, Desmond described the progress electric boats had made in the past 30 years and summarized his vision for the future, including the creation of a World Electric Boat Association.

Desmond echoed similar sentiments that Constantine Constantinou of Greenline had concerning the challenges electric and hybrid boats face. "The challenge will be to convince owners and operators that there is no need for range anxiety. We need to realize that electric boats are calming, even therapeutic, in a world where stress is a serious threat."

Van Gruisen, when I spoke to him last, offered up that battery technology will be last frontier when it comes to electric boats.

"It's the last piece of the puzzle. As battery technology increases, we'll hopefully see electric boats going faster and farther."

Wall Street

Fast Ferry Gets a New Power Package

While many owners discuss ideas to suitably maintain maritime service while slashing operating costs, Seasteak LLC, owners a 43m fast ferry Wall Street, put words into action with a dramatic propulsion switch that saw the company maintain sailing schedule and speed while reducing fuel consumption 30% and CO2 emissions 50%.

Wall Street, a 43m fast ferry owned by Seastreak LLC of Atlantic Highlands, NJ, was originally built by Gladding-Hearch Shipbuilding and launched in 2003, the third of four sister vessels. As built, Wall Street was equipped with four KaMeWa A50 waterjets powered by four Cummins KTA50 diesel engines of 1424kW each and a total output of 5696 kW. At the time of construction, the vessel was state-of-the-art, and the four-engine package was selected with an emphasis on speed and reliability on the Atlantic Highlands, NJ, to Manhattan service.

As the equipment aged and fuel prices skyrocketed, however, the decision was taken to investigate repower options for the ferry, as the owner sought a reduction in both emissions and fuel consumption, as well as reduced maintenance cost and reduced wake during operation.

Seastreak's director of vessel engineering developed estimates based on Servogear's Ecoflow Propulsor concept. In cooperation between Servogear, Norway, Incat Crowther Design (the vessel's original designer) and Seastreak, the repowering was studied.

With the assistance of a U.S. government energy efficiency improvement loan Seastreak made the decision to remove one ferry from service and refit it from a quadruple engine/water jet vessel to a twin engine twin screw Servogear CPP propulsion system.

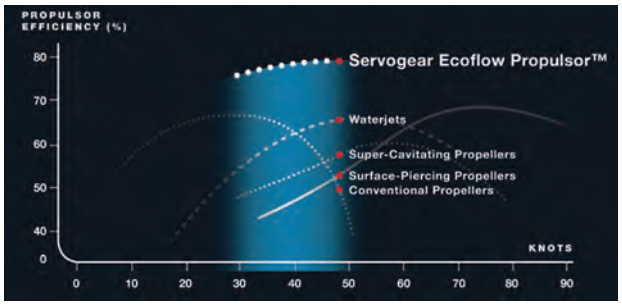
In addition, the owner decided to power the vessel with a pair of MTU 16V4000M53 diesel engines rated 1840 kW each. In looking at the vessel's operational profile, Servogear's controllable pitch propellers, tunnel design and rudders promised a significant fuel saving at the vessel's 32 knot operating speed. With Incat Crowther providing a comprehensive design service, preparing detailed drawings and documentation including revised Coast Guard submissions, the contract to perform the work was awarded to Midship Marine in Louisiana. The engine re-powering entailed a re-configuration of the vessel's aft. The topsides and the undersides of the hulls were removed from the waterline down, from the forward engine room bulkhead aft. New engine beds, longitudinal stiffeners and plating were fabricated to support the MTU-engines and ZF-gearboxes. Servogear designed tunnels lower hull resistance and provide optimal inflow of water to Servogear's propellers and rudders.

Together with interior and exterior modifications, Wall Street today is 15 tonnes lighter than when originally built.

At sea trials the vessel recorded speeds of 36 knots, and at equivalent dead-

Seastreak's Wall Street Repower Synopsis

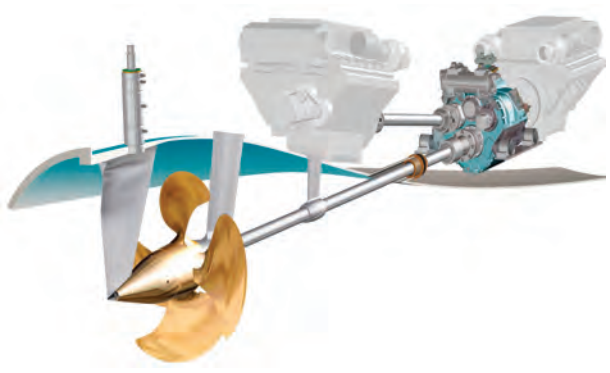
Installed power:	Reduced from 5696 kW to 3680 kW (35%)
Fuel consumption:	Reduced 30% (est. $500,000/year)
Weight:	Reduced 15 tonnes
CO2 emissions:	Per-passenger value halved



weights, this represents a reduction in top speed of three knots, despite a significant reduction in power. When the increased passenger capacity is considered, the refit means that per-passenger CO2 emissions are halved.

The Servogear Ecoflow Propulsor

Servogear is a Norwegian company, and like many of its brethren, it was born in the early 1970s to serve a large, dynamic and technically stressed fishing fleet around Norway. Established in 1973 in Rubbestadneset, Norway, today the company serves a diverse customer base globally, from fast ferries to offshore service vessels to workboats and yachts. It employs 48 and to date has delivered more than 1500 gears and propulsion systems worldwide. The Servogear Ecoflow Propulsor concept is highlighted by a variable pitch propeller in a unique propeller tunnel. The entire system is inclusive of: a special effect rudder; shaft and support brackets; reduction gearboxes, and stern tubes.



Servogear propeller bracket & propeller

Caterpillar

Cat tackles Tier 3 and Tier 4; Completes Berg Deal

Caterpillar 3516B engine with 3500 emissions upgrade.

By Eric Haun

Caterpillar Marine and Power Systems was one of the most active companies at the 2013 International Workboat Show in New Orleans, debuting several new products that are compliant with EPA Tier 3 and 4 regulations, and finalizing the acquisition of propulsion equipment manufacturer Johan Walter Berg AB.

Caterpillar Inc., which is one of the biggest names in industrial equipment, engines and turbines, recorded 2012 sales revenues of $65.9 billion. Contributing to that sum is Cat's globally-operating subsidiary, Caterpillar Marine and Power Systems, which was established in 1996 to conduct all sales and service operations for its Cat and MaK marine power and propulsion products. According to Caterpillar Marine project manager Luiz Pustiglione, the company is in the midst of a strong 2013, especially in the tug/salvage and offshore sectors. "[Cat is] continuing to drive innovative solutions and services to the market," he said.

Tier 4

In New Orleans Cat unveiled its first marine engines to reach U.S. EPA Tier 4 requirements: the Cat 3516C, Cat 280-8 and Cat 280-12. Targeting the tug/salvage and offshore industries, Caterpillar's Tier 4 platforms combine fuel efficiency (approximate 5% fuel reduction) with selective catalytic reduction (SRC) aftertreatment system to meet the Tier 4 NOx requirements.

Though Cat said it anticipates expanding its Tier 4 compliant line with the launch of several additional offerings in the near future, for now the existing Cat Tier 4 options are as follows:

- The Cat 3516C will be available in ratings of 2,240/2,350 bkW at 1,800 rpm, and an auxiliary or diesel electric propulsion solution at a 2,250 ekW,
- The Cat 280, in both 8- and 12-cylander configurations, is available at 2,460/2,710 bkW at 1,000 rpm and with auxiliary engines and diesel electric propulsion generator set available of 2,7185/2,400 ekW at 900 rpm for the C280-8 option, and 3,700/4,060 bkW at 1,000 rpm with auxiliary and diesel electric of 3,320/3,640 ekW at 900 rpm for the C280-12.

Caterpillar already possesses a range of EPA Tier 3/IMO II compliant propulsion options. One of them, the Cat C32 ACERT, became available this year as an EPA Tier 3 certified auxiliary option and generator set. Now with a separate circuit aftercooling system (SCAC) for three power ratings (A-C), the system removes seawater from its coolers. According to Cat, the C32 ACERT provides favorable operating costs and longer oil change intervals, while the C32 ACERT offers seven WOSR ratings.

Berg Acquisition Complete

Also in New Orleans, Cat Marine announced the finalization of its acquisition of Johan Walter Berg AB and its subsidiaries. Berg's core brand, BERG Propulsion, which manufactures mechanically and electronically driven propulsion systems and marine controls, will now fall under the umbrella of newly formed Cat Propulsion Systems.

With this Caterpillar follows the trend toward becoming a one-stop-shop for full powertrain needs, from the engine to the propeller.

According to representatives from Cat, there are already more than 2,000 vessels operating with Cat/Berg integrated power and propulsion. To simplify this arrangement, Cat customers can now obtain a power solution and thruster/propeller package from one source, without a third-party vendor.

Nigel Parkinson, managing director of Caterpillar Marine Power Systems, said, "As a result of [this acquisition], our customers can rely on Caterpillar and the Cat dealer network to provide the total package: a complete propulsion system that is supported globally."

Propulsion system bundles from Cat now include controllable pitch propellers, transverse thrusters, azimuth thrusters, aftermarket parts and remote control systems to correspond with all Cat and MaK medium and high speed engines.

Tom Frake, Vice President of Caterpillar's Marine and Petroleum Power Division, said Caterpillar is targeting additional acquisitions, like Berg, as the company aims to maintain growth in the marine division. Frake said that Cat spent roughly $400 million in the last two years on research and development, a trend that he noted is likely to continue as the company plans future investments.

Company research and client feedback led Caterpillar to recently expand its customer support with new repair solutions and extended warranty coverage. Operators such as Hornbeck Offshore and Harbor City Ferries have already purchased customizable service and repair options as part of the company's new 3406 bundled repair solution, a customizable kit for expedited major engine overhauls. Now temporarily available with the kit is complimentary two-year, 6,000-hour warranty extended service coverage, with an option for up to three years and 12,000 hours.

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The complete package from Konrad and Cummins incorporates Konrad drives and Cummins engines.

Konrad

Announces Cummins propulsion package partnership

By Eric Haun

Sterndrive specialist Konrad Marine formally entered a partnership with diesel engine manufacturer Cummins Marine to jointly offer a complete propulsion package to the commercial, military and recreational maritime markets, a partnershipo announced October 9 at the Workboat Show in New Orleans.

The package combines Cummins' new QSB 6.7L diesel engines (230-425 hp) and Konrad Series 600 sterndrives to present a full propulsion offering, ultimately providing customers with a simplified, tested option from a single source. Also included are the engine mounts, flywheel coupling, bellhouse adapter, transmission and cooler, direct mount assembly, sterndrive and propellers. Controls, displays, gauges, remote mounted systems and water pickup can be purchased as optional add-on features.

The Cummins 6.7 engine is offered in ratings of 230 MHp at 3,000 ID, 250 MHp at 2,600 HO/HD, 305 MHp at 2,600 HO/MD, 355 MHp at 2,800 ID, 355 MHp at 3,000 HO, and 380 and 425 MHp at 3,000 HO/ID. Konrad sterndrives available though the package are the 620 single prop (up to 20 inches), the 660 high speed dual prop (up to 16 inches) and 680 heavy loads dual prop up to (20 inches).

VT Halmatic Wind Dancer has been fitted with a Cummins engine and Konrad drives.

The offering will be sold primarily through Cummins distributors with help and support from Konrad. The partners will together qualify, configure, sell, install and support customers with regionally tailored sales/service plans.

"Cummins and Konrad have been working together for more than 15 years and have thousands of successful installations to our credit," said Julie Heifner, Marketing Director, Konrad Marine. "The concept of coupling Cummins engines and Konrad drives is a proven success in each of the diesel market segments including military, commercial, and recreational."

Though Konrad said a majority of its marine drives already operate with the Cummins B series, the companies believe an official collaboration would put forward a more reliable option, resulting in predefined, tested and approved packages with simplified installations.

"Formalizing our offering and our relationship is great news for our customers – ensuring them the highest level of consistency and efficiency from both factories in manufacturing, pricing, distribution, and support," Heifner said. "The package is designed to maximize customers' return for their investment in performance, durability and longevity."

www.konradmarine.com
www.marine.cummins.com

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Scania

13L Inline; 16L V8 for EPA Tier 3

Scania's 13-liter EPA Tier 3 engine, intended for propulsion and auxiliary use, along with the 16-liter EPA Tier 3 engine, debuted last month at the Workboat Show in New Orleans. The engines, as are all Scania powerplants, are based on the company's new modular engine platform, a platform used across marine, industrial, power generation, truck and bus applications globally. The units are built for simplicity of service and repair, and the company is quick to point out that most can be carried out by a single service technician, owing to the fact that each cylinder has its own head, which together with wet cylinder liners makes for easy overhauls in confined spaces. The camshaft is located high in the block and the timing gears are rear-mounted to increase the accuracy of engine timing and reduction of noise. The output ratings for Scania's newest version of the 13-liter marine propulsion engine ranges from 250-675 hp, and will continue to have outputs up to 750 hp for use in international and exempt markets. For auxiliary applications the range for EPA Tier 3 is 269-426 kW. A few notable points on the engine are Scania's centrifugal oil cleaner designed to remove small particles from the lubrication oil, while reducing the size of the replaceable filter cartridge. Also, the Scania saver ring placed at the top of each cylinder liner is designed to reduce carbon deposits on the edge of the piston crown and reduces cylinder liner wear. Even with higher performance and tighter emission levels, Scania has been able to increase maintenance and oil change intervals by 25% (now 500 hours) in comparison to its predecessor.

Scania 16-liter V8 EPA Tier 3 Engine

Scania's 16-liter V8 EPA Tier 3 engine, intended for propulsion and auxiliary use, was also on display in New Orleans. Scania V8 engines are engineered to produce high power while maintaining a size that is compatible for auxiliary equipment. The V design reduces the overall length of the engine which also makes for easy installation. Ancillaries can be effectively accommodated inside the footprint of the engine.

The output ratings for Scania's newest version of the 16-liter marine propulsion engine ranges from 550-900 hp, and will continue to have outputs between 550-1,000 hp for use in international and exempt markets. For auxiliary applications the range for EPA Tier 3 is 468-553 kW, and the current range will continue to be offered between 430-596 kW for international and exempt markets. Scania said users can also expect to see an increase in the V8's output ratings that are used for keel cooled applications, moving up to the highest output. Scania also has a new type-approved instrumentation that facilitates installation via a user-friendly and flexible web interface; the marine operator can adapt the information on the displays and choose any required data to be shown. There are program templates for water temperature, engine speed, oil pressure and fuel consumption.

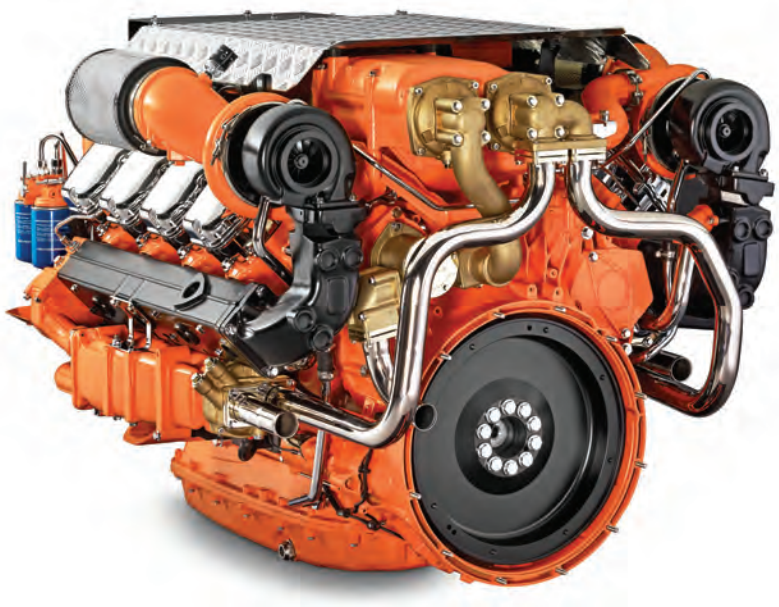
www.scaniausa.com

Scania 13-Liter Inline Engine

Auxiliary power	
Power:	269-426 kW at 60 Hz
Propulsion power	
Power:	250-675 hp, 186-503 kW
Swept volume:	12.7 liters
Length:	59 in.
Width:	38 in.
Height:	46 in.
Dry weights	
With heat exchanger:	2,623 lb.
With keel cooling:	2,513 lb.

Scania's 16-liter V8 engine

Auxiliary power	
Power:	468-553 kW at 60 Hz
Propulsion power	
Power:	550-900 hp, 405-662 kW
Swept volume:	16.4 liters
Length:	61 in.
Width:	49 in.
Height:	48 in.
Dry weights	
With heat exchanger:	3,682 lb.
With keel cooling:	3,527 lb.



Scania 16-liter V8 EPA Tier 3 Engine

The Switch

New Drive Train Tech for the Shipbuilding Sector

The Switch is a Finnish manufacturer of permanent magnet motors, generators and converters which recently launched what it dubs as a 'next-generation drive train' for energy efficient power generation and propulsion of merchant vessels. The solution, according to the company, combines The Switch's permanent magnet and frequency converter technology to help open new opportunities for hybrid propulsion systems in the shipping sector.

Electrical drive trains based on permanent magnet (PM) technology from The Switch are designed to provide advanced control with a permanent magnet motor and a frequency converter as the major components. The controller acts as the "brains" for energy efficiency, designed to the network stable regardless of external conditions.

The Switch claims that its solution is "game-changing" as it enables vessels to produce electricity efficiently for the ship's network, while allowing the operator to keep the auxiliary generators off and allow the main engines to operate at variable speed and generate electricity.

While soaring fuel prices, chronic overcapacity and lagging business have many in the deepsea sector scrambling for innovative means to shave operating costs, Jukka-Pekka Mäkinen, President and CEO of The Switch, contends that the investment helps owners to realize immediate payback. "It will enable ship owner to save up to $67,000 per month in fuel costs, which may add up to 7% more profit per year."

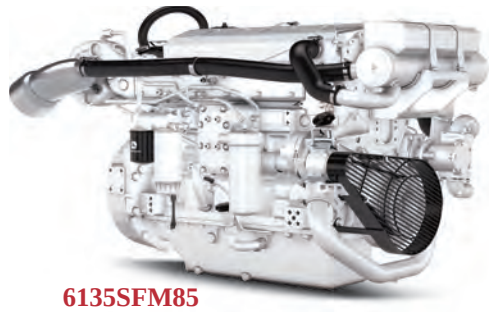
Permanent magnet generator technology has gained a successful track record in other industries, offering flexible and fuel efficient operation. PM machines can be more compact, lighter in weight and smaller in size.

According to the manufacturer, adding a frequency converter to a shaft generator allows a ship to control its speed and ensure a stable source of electricity for the ship's network. The frequency converter allows the ship to choose between taking power from the main engine or from the auxiliary generators, as deemed best.

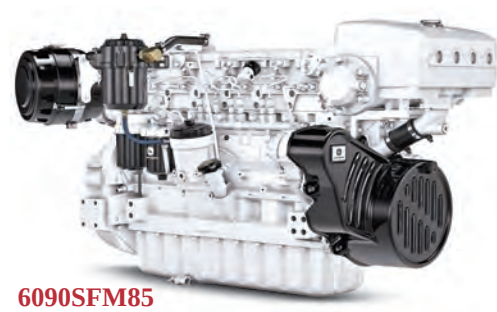
www.theswitch.com

John Deere

Tier 3 Engine Line Up



6135SFM85



6090SFM85

Photo: John Deere Power Systems

John Deere Power Systems (JDPS) said it will meet U.S. EPA Marine Tier 3 emissions regulations with a lineup of diesel engines from 74-559 kW (99-750 hp). New PowerTech 9.0L and 13.5L Tier 3 propulsion and generator-drive engines join the previously announced 4.5L and 6.8L Tier 3 models. The PowerTech 6090AFM85, PowerTech 6090SFM85, PowerTech 6135AFM85 and PowerTech 6135SFM85 propulsion and generator-drive engines are the latest additions to the JDPS Tier 3 lineup. JDPS added two new 9.0L models to its lineup of Tier 3 marine engines: the PowerTech 6090AFM85 and PowerTech 6090SFM85 propulsion and generator-drive engines. The PowerTech 6090AFM85 is an air-to-coolant aftercooled version of the John Deere 9.0L engine. It is available in four different propulsion ratings from 213-317 kW (285-425 hp); gen-set ratings include 222 kW (297 hp) at 1,800 rpm for 60 Hz and 195 kW (261 hp) at 1,500 rpm for 50 Hz.

The PowerTech 6090SFM85 is a turbocharged and air-to-seawater aftercooled engine. The model is available in five different propulsion ratings from 242-410 kW (325-550hp); gen-drive ratings include 222 kW (298 hp) at 1,500 rpm for 50 Hz and 278 kW (373 hp) at 1,800 rpm for 60 Hz.

JDPS 13.5L Tier 3 propulsion and generator-drive engines include the PowerTech 6135AFM85 and PowerTech 6135SFM85. The PowerTech 6135AFM85 is the largest John Deere air-to-coolant aftercooled engine, and is available in four different propulsion ratings from 272-429 kW (365-575hp); genset ratings include 334 kW (448hp) at 1,800 rpm for 60 Hz and 278 kW (373 hp) at 1,500 rpm for 50 Hz. The PowerTech 6135SFM85 is the most powerful engine produced by John Deere. The turbocharged and air-to-seawater aftercooled engine features six cylinders and electronic controls, providing high torque at low speeds. The 6135SFM85 model is available in five different propulsion ratings from 317-559 kW (425-750 hp); gen-drive ratings include 416 kW (558 hp) at 1,800 rpm for 60 Hz and 334 kW (448 hp) at 1,500 rpm for 50 Hz.

www.johndeere.com/jdpower

GE Power Conversion

To Provide Hornbeck Vessels DP

Hornbeck Offshore will employ GE Power Conversion's latest generation DP technology for its four new multipurpose supply vessels (MPSVs). In their role as MPSVs, they can operate as either a subsea construction vessel capable of performing complex subsea construction operations or as a resupply and support vessel to ultra deepwater drilling in the Gulf of Mexico, or anywhere else in the world as required by their charterers. "The DP solution and its user interface is the heart of a ship's positioning system. When we can continue to work with a company that knows us, has supplied us with systems in the past and, with our input, can supply us with a next generation system we can rely on, it remarkably enhances our mission to provide value-added business solutions for our own customers," said Carl G. Annessa, EVP and COO at Hornbeck Offshore. "By using GE's solution, we gain efficiency and flexibility thanks to a commonality of systems, as well as access to a global team of experts."GE will power, propel and position the new ships by delivering the integrated diesel-electric system including generators, propulsion and thruster drives, motors, switchboards, LV distribution, transformers, Class 2 DP, power management, alarm and monitoring, vessel control and an integrated bridge system comprising a comprehensive navigation and communications suite including radars, ECDIS, GMDSS and a full suite of internal and external communications systems. GE is also equipping Hornbeck's series of 10 PSVs.

EPA's Vessel General Permit (VGP) & You

Nothing stirs the maritime pot like new regulation, and coming soon to you (in less than a month) is the new iteration of the Vessel General Permit (VGP). The VGP applies to vessels operating in a capacity as a means of transportation, that have discharges incidental to their normal operations into waters subject to this permit, except recreational vessels. Unless otherwise excluded from coverage, the waters subject to this permit means "territorial seas" of the U.S. The Clean Water Act (CWA) does not require NPDES permits for vessels or other floating craft operating as a means of transportation beyond the territorial seas, such as in the contiguous zone or ocean. The Environmental Protection Agency (EPA) is issuing a replacement VGP permit under its authority from the CWA. **The new VGP provides effluent limits for 27 specific discharge categories.**

The types of vessels covered under the VGP include commercial fishing vessels, cruise ships, ferries, barges, mobile offshore drilling units, oil tankers or petroleum tankers, bulk carriers, cargo ships, container ships, other cargo freighters, refrigerant ships, research vessels, emergency response vessels, including firefighting and police vessels, and any other vessels operating in a capacity as a means of transportation. While all non-recreational vessels, which are not vessels of the armed forces, may seek coverage under this permit. The permit requirements are generally targeted to vessels that are at least 79 feet in length. **The EPA estimates that the domestic vessel population subject to the VGP is approximately 60,000 vessels; it estimates approximately 12,400 foreign flagged vessels are subject to the VGP requirements.**

Lubricants Companies Invest

As with any new industry rule, those that stand to gain business from new requirements work well in advance to ensure that its product and service line-up is well-positioned to prosper. This has been the case with VGP, particularly with lubricant and fluids manufacturers that for years have been tasked to refine product that are more environmentally benign while maintaining performance standards.

"To ensure ExxonMobil Marine Fuels and Lubricants can help operators to meet the stringent requirements, we have developed a new comprehensive series of synthetic, environmentally acceptable lubricants, the Mobil SHC Aware range," said Iain White, Global Field Marketing Manager, ExxonMobil Marine Fuels & Lubricants. The new Mobil SHC Aware range has been formulated to not only help engineers comply with the new marine operating practices, but to enhance vessel reliability, minimize maintenance costs and reduce potential environmental impact. The Mobil SHC Aware range includes:

- Mobil SHC Aware H hydraulic fluids
- Mobil SHC Aware ST stern tube lubricants
- Mobil SHC Aware Grease EP 2 multi-purpose grease
- Mobil SHC Aware Gear range of gear oils

"RSC Bio Solutions has a legacy of developing these kinds of products since 1996, and we have worked with OEMs and other industry stakeholders for quite some time to deliver technically sound, environmentally acceptable products with high performance," said Mike Guggenheimer, President & CEO, RSC Bio Solutions.

"In light of the recent changes to the VGP regulation, RSC Bio Solutions undertook a significant process to repeat our documentation and testing studies on biodegradation, toxicity, bioaccumulation to ensure we would be able to unequivocally certify our products as compliant. RSC Bio Solutions has also extended our production and distribution network as the market for EALs has grown on a global stage.

Our EnviroLogic EALs (100 Series and 3000 Series) are suitable, proven and approved for a wide range of applications, including controllable pitch propellers, thruster and hydraulic fluids and other oil-to-sea interfaces including lubrication discharges from stern tubes, thruster bearings, stabilizers, rudder bearings, azimuth thrusters, propulsion pod lubrication, wire rope and mechanical equipment subject to immersion. Applications for our SAFECARE cleaners include deck and equipment washing, general purpose cleaning, degreasing, parts cleaning and oil stain removal," Guggenheimer concluded.

In a discussion on the show floor in New Orleans last month, Panolin maintains that it was already well-ahead of the VGP game as it has nearly 30 years experience producing environmentally-considerate lubricants. Panolin offers its VGP-compliant Greenmarine products to help owners and operators meet the imminent EPA requirements. Panolin Greenmarine lubricants use fully saturated synthetic esters and specially developed additives to achieve 100% VGP and sVGP compliance without sacrificing performance. The range includes hydraulic fluids, gear oil and production line control fluids, as well as lubricants for stern tubes, gear boxes, cables and sliding parts. These products have proven themselves through harsh continued use in dredging, offshore, subsea, marine and hydropower applications with customers around the world. These synthetic lubricants are designed to separate from water easily and quickly due to their fully saturated ester compound, and possess self-drying characteristics when heated. Their higher affinity to water and moisture content allows for water separation and removal, providing long-term product stability and durability. By also decreasing the frequency of oil changes and enhancing operating efficiency, these products effectively reduce CO2 emissions.

Castrol Marine believes in developing an entire range of marine grade lubricants based on an unfolding legislative program, and at the same time securing OEM approvals ahead of time. But it also believes its coordinated efforts to share regulatory knowledge with customers will not be sufficient; only by working with customers to forecast the size and location centers of demand for its EAL compliant range can it claim to offer a truly market responsive approach.

Castrol BioStat and BioBar ranges are registered under OSPAR (Convention for the Protection of the Marine Environment of the North-East Atlantic) and therefore meet the criteria for being EALs under the VGP. Owners will also need to be assured that the products they select meet acceptable standards in terms of performance. Here, Susannah Linington, Castrol Marine Environmental Specialist, explains that Castrol Marine has spent the four years since the revised VGP was first raised securing OEM approvals for BioRange products in the marine context.

As important as performance is that the product is documented to meet the new requirements, ultimately the vessel owner is responsible. "Claims for 'environmentally responsible' products are made widely but can sometimes be misleading," said Linington. "It is a great step forward having defined criteria for determining the environmental performance of marine lubricants. This means that environmental claims can be backed up by relevant scientific testing."

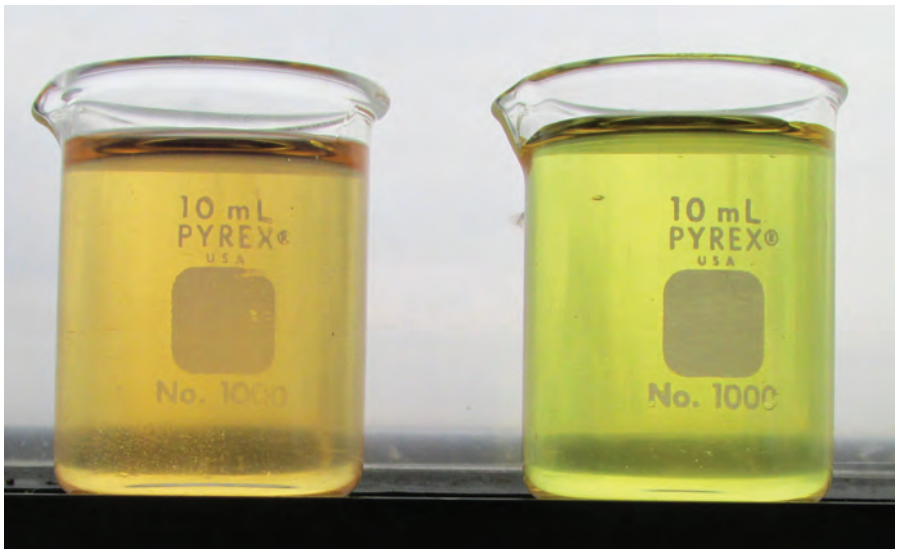
According to Linington, Castrol's first principle for BioRange was to offer drop-in replacements for lubricants based on conventional mineral oils.

Finally, Vickers said its HYDROX BIO, ECOSURE HSE and BIOGREASE EP2 ranges of Environmentally Acceptable Lubricants (EALs) meet the detailed ecological definitions and requirements laid down in the 2013 Vessel General Permit (VGP). Vickers Oils has approvals for its EALs from many of the relevant equipment manufacturers. Stocks are carried in ports around the world.

What's it Going to Cost?

It wouldn't be a new rule if it didn't hit your bottom line. The table below provides the EPA's projected low end and high end estimates concerning the General Inspection and Paperwork costs associated with compliance across the board for the VGP.

Vessel Class	Low End Estimate	High End Estimate
Commercial Fishing	$34,496	$254,545
Freight Barges	$193,893	$193,893
Freight Ships	$20,593	$20,593
Passenger Vessels	$15,322	$15,322
Tank Barges	$34,839	$34,839
Tank Ships	$8,661	$8,661
Utility Vessels	$102,182	$102,182
Total	$409,986	$630,036



PAG's; one and all: DOW's UCON Trident PAG Hydraulic Lubricant (orange) and American Chemical Technology's Trident Gear Lubricant (bright green shade yellow).

Are PAGS the answer?

Ron van Wachem, President of Coast Lubricants and Nanaimo Shipyard Group, reasons that PAGS are the best solution to meet the new VGP requirements.

In December 2013, the EPA through its Vessel General Permit (VGP) will introduce the mandatory use of "Environmentally Acceptable Lubricants," or EALs. These products include the lubricating oils that are directly used in applications referred to as "oil to sea interfaces" where the only thing holding the oil from entering the water is a simple seal or gasket. Understanding what this all means to you is important. The U.S. EPA has determined that four major types of lubricants meet all the necessary required criteria to be classified as an "approved EAL" are as follows:

- Vegetable Oils
- Synthetic Esters
- Polyalkykene Glycols PAGs
- Water

The Case for PAG's

PAG's do not sheen the water, are non-toxic and not classified as "oil" by the U.S. Coast Guard and Transport Canada. PAG fluids are approved by the US EPA as acceptable EALs due to both the rate of biodegradability and low aquatic toxicity.

Beyond these traits, PAGs demonstrate superior load carrying ability, superior thermal stability (withstanding temperatures up to 250 F), material compatibility, are fire resistant and are not only heavier than water (specific gravity of approximately 1.03), but also dissolve readily when mixed with water.

Since these products completely dissolve and dissipate when discharged into water, they do not form an oil slick. The slick itself, regardless of the toxicity or biodegradability of the oil in the event of a spill accounts for much of the initial mortality in marine wildlife in the initial stages of the discharge.

One of the reasons the U.S. EPA enacted the 'Clean Water Act of 1990" and the "Non-sheening regulation 40 CFR 435" was to try to reduce the environmental impact of any type of free oil floating in the surface of the water. If the fluid is neither a hazardous chemical and is not considered oil, it is exempt from this act as well as OPA 90 oil spill cleanup regulations. This will not only reduce or eliminate fines but can reduce the scope and costs associated with aquatic oil spill cleanup procedures and remediation.

PAGs can be designed and tailored achieve certain characteristics or capabilities in order to perform very specific functions or performance requirements to suit the application ("designed," not refined).

Finally, PAG fluids are suited to the marine environment. They have very minimal or a negligible reaction to the presence of moisture or water, so corrosive acids and gums are not produced, as they would be with hydrocarbons and especially vegetable oils and vegetable esters. They can accept up to 1.5% water contamination (15,000ppm) before any performance degradation. There is no saturation point as there is with conventional hydrocarbons (maximum saturation point of most mineral oils is 200 ppm), but viscosity and lubricity will

Don't Forget: Seawater is a Free EAL

If your vessel is trading in U.S. waters, you need to be aware of the new oil to sea interface law that comes into effect on Dec. 19, 2013. According to the new U.S. Environment Protection Agency Vessel General Permit (VGP), all vessels built on or after Dec. 19, 2013, must use an environmentally acceptable lubricant (EAL) in all oil to sea interfaces. For all vessels built before this date, unless technically not feasible, ship owners must use an EAL in all oil to sea interfaces. Additional information on the EPA's VGP can be found at http://cfpub.epa.gov/npdes/vessels/vgpermit.cfm#final.

Most ships use mineral oil to lubricate the propeller shaft, and the oil is contained in the stern tube by the aft seal – which is the oil to sea interface. In most cases, you cannot simply replace the mineral oil with seawater or other oil-based EAL's. Oil-based EALs need to be compatible with the sealing materials to ensure leakage is controlled – shipowners will need to check with their seal supplier and it may be necessary to upgrade the sealing rings or upgrade to a new seal. Typically, costs of oil-based EAL's are 3-5 times more expensive than mineral oils. If you are using an air seal, you are still required to use an oil-based EAL, as it is not possible to guarantee that oil leakage will never occur.

Still a concern for ship owners is that oil-based EALs are still considered a pollutant under the Oil Pollution Act of 1990 (OPA 90) and U.S. Clean Water Act (if there is a sheen). Any discharges of oil-based EALs still require reporting of the discharge to the U.S. Coast Guard, as well as having clean-up and remediation costs. Even though biodegradable lubricants may be deemed non-toxic by OECD testing, their presence on the water surface is a threat to seabirds.

For newbuildings, some ship owners are specifying seawater lubricated propeller shaft bearing systems, as more than 600 commercial ships are using a seawater-lubricated system that uses no oil – meaning full compliance with the VGP. (Some shipowners such as Princess Cruises, COSCO, Disney Cruise Lines, U.S. Gypsum Corp., CSL Group, Algoma Corp., Flinter Group, ConocoPhillips, Carisbrooke Shipping and Staten Island Ferries have chosen to use seawater as the propeller shaft lubricant.)

Currently, the U.S. EPA recommends that all newbuild vessel operators endeavor to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment.

Existing ships can be converted to seawater-lubricated propeller shaft systems as these systems typically fit in the same space as an oil lubricated system. The oil-to-seawter conversion is accomplished during a planned drydock where corrosion resistant shaft liners and a water lubricated forward seal were preordered and the shaft and non-metallic bearings were ready for install when the ship drydocked.

Typical netting and rope around rotating shaft damages aft seal.

So when it comes to discharges from a ships propeller shaft system, the shipowner that trades in U.S. waters has two choices for their existing ships and ships they plan to build: 1) replace mineral oil with an oil-based EAL to lubricate the metal bearings and ensure the seal is compatible with the EAL, or 2) convert or build a ship using a seawater-based system using non-metallic prop shaft bearings.

By Craig D. Carter, MBA, Director of Marketing and Customer Service at Thordon Bearings Inc.

slowly be reduced as the water content is increased. PAG fluids also offer excellent corrosion protection if affected by water; after all, water glycol hydraulic fluids used in the steel and smelting industry contain up to 45% water. Vessel owners are now all looking at the new EPA VGP regulations which come into effect at the end of this year. They need to realize what they are trying to achieve now and in the long run. Environmental compliance should be at the top or near the top of that list. Next should be cost effectiveness and performance. In the past, many ship and equipment managers avoided using vegetable oils and mineral oils as they are viewed as costly and inferior lubricants that require much more maintenance and bring their own set of problems. The petroleum and lubricant industry often dismiss PAGs because they are not compatible with other conventional oils and are not produced by major refiners. PAG fluids such as Dow's UCON Trident AW, BASF Plurasafe Enbio TC, and American Chemicals Technology's Neptune (including EP and XP) lubricants are anhydrous, or contain no water, and offer the performance characteristics listed above. PAG fluids have already solved high heat and varnish issues in harsh applications such as compressor and turbine fluids, where even PAOs were failing due to the severe heat and friction (American Chemical Technologies have now received approval from GE to use PAGs in its turbines). Shipowners are now realizing that PAGs can offer more than just a solution to the VGP issue but also the benefit PAGs can have to their compressors and other equipment that are subject to harsh operating conditions in marine environments. PAGs are often said to be very costly, but take into account their performance characteristics, long life, environmental footprint, etc., and they can be proven to be cost effective.

The U.S. Coast Guard uses PAG type lubricants.

Lukoil: Cylinder Oil to Reduce Wear, Consumption

Lukoil Marine Lubricants reports that it has expanded its sales in the 2012 business year by 74% to around $200m. Established in 2008, the subsidiary of Russian oil group Lukoil continues to grow rapidly. As Lukoil Marine Lubricants CEO Victor Zhuravskiy recently said, "Totally supported by our parent company, we have succeeded in developing an efficient, global enterprise that is currently leading the sector in terms of growth."

As for operative and technical expertise, since entering into the global lubricating oil business Lukoil has relied on its Hamburg site. "Here we are in close proximity to our customers, because Germany, and Hamburg in particular, remains one of the world's most important shipping hubs. The combination of Russian raw materials, worldwide leading additive technology and German engineering has become a success factor for us." **To round off the connection to Hamburg, shipping line Hapag-Lloyd's Hamburg Express also uses Lukoil products for lubrication.**

Stefan Claussen, technical and marketing director at the Lukoil Marine Lubricants Hamburg office, sees two factors as being the main reasons for success: "We are constantly expanding our global network. In addition, we were the first company to recognize the requirement for new, high alkaline cylinder lubrication oil and began development at an early stage."

The practice today of reducing ship speeds (slow steaming) can significantly reduce fuel consumption costs. However, the constant partial and low burdening of a ship's engines requires high alkaline cylinder lubrication oils with a base number of at least 70 mg KOH/g – a measurement of the capability for neutralizing acidic residue that forms during the combustion of heavy oil. The performance, consumption and emissions of ship engines have been further optimized in recent years, resulting in ultra-long-stroke engines that are operated at even lower rpms.

"The new operating conditions and new engines require a higher than ever level of alkalinity in the cylinder lubrication oil, which can be achieved either through increasing consumption or increasing cylinder lubrication oil alkalinity to, ideally, 100 mg KOH/g," said Claussen. "Whether under slow steaming conditions or in the new consumption-optimized engines, the consumption of cylinder lubrication oil with a higher base number is significantly reduced by up to 25 to 45% and protection against wear is also enhanced."

Lukoil consequently recommends the use of cylinder lubrication oils with base numbers of 70 and 100 mg KOH/g to its customers. The 'flagship' product amongst these is the newly developed LUKOIL NAVIGO 100 MCL. "In cooperation with the engine manufacturers MAN and Wärtsilä, we have demonstrated the new oil's performance capability on a variety of ship engines," said Claussen. "As an example, the wear rate was improved and cylinder oil consumption reduced in a state-of-the-art MAN S80ME-C Mk 9.2."

Agip Rebrands as Eni

Powers Ahead in North America

Agip has recently rebranded as Eni, while simultaneously announcing plans to increase penetration of its lubricant brands in North America across all industries. Gianfranco Mosconi (above) President and CEO of Eni USA R&M Co., shares the vision behind the strategy.

Gianfranco Mosconi, with a Bachelor in Civil Engineering and a Master's in Hydraulic Engineering, has been working for Eni since 1984. He started in charge of the Logistics Department; transferring to the Lubricants Business Unit were he has been in charge for Production Department and then the Supply and Sales Departments. For the past three years he has served as the President and CEO of Eni USA R&M Co. Inc., the company that produces and sells lubricants in the North America market.

On September 28, eni held an event in Laguna Seca (Monterey, Ca), with the focus to launch the new eni lubricants product lines to its U.S. and Canadian Distributors. (Laguna Seca is a Superbike motorcycle race, and eni is a title sponsor.) The new product lines are eni i-Sint (passenger cars lubes) eni i-Sigma (heavy duty lubes) and eni i-Ride (motor bike lubes already launched in 2012). "All Agip product names have been replaced with eni the new international brand name," said Mosconi.

While Mosconi reports good reaction to the change, complete with a moden appearance and the new eni i-Sigma product, he stressed staying committed to the company's past success. "Naturally, our legendary six-legged dog and our company colors continue to be our logo," Mosconi said. "The dog standing proud and strong, supporting the successful brand change from Agip to eni."

The challenge to further penetrate North America lies in building stronger relationships with distributors and national accounts, Mosconi reckons. "In addition to our new products eni i-Sint and eni i-Sigma with OEM's specs, we offer our distributors other products that cover all market applications: marine oil, compressor oil, hydraulic oil, cutting oil along all conventional and semi-synthetic engine oil. Let me emphasize once more that our distributors are our partners, to whom we provide any support they need, from technical assistance, dedicated training to product literature in order to increase sales. This perfectly fits with eni's global lubricant strategy to build on local partners to be closer to the market. The unique values of eni, the local market knowledge and network of our distributors are the special ingredients to succeed in North America."

Don't Be Fooled By These Misused Words.....

Environmentally Friendly →

"Inherently" Biodegradable →

Green →

Effective December 19, 2013 Marine Lubricants Are Either Environmentally Acceptable Lubricants (EAL's), Or They Are Not

US EPA Criteria:

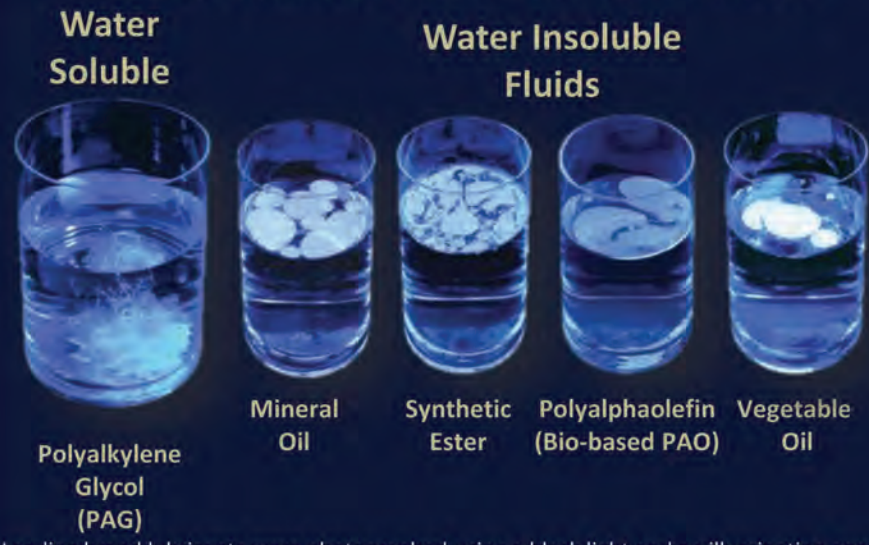
1. ***Biodegradation*** – The process of chemical breakdown caused by microorganisms or their enzymes in which said chemical may be decomposed and absorbed by the environment.
   - Lubricants must be rated "Readily Biodegradable." "Inherently Biodegradable" does *NOT* qualify as an EAL.
2. ***Aquatic Toxicity*** – The damaging effect on marine life and population resulting from exposure of toxic substances. Aquatic toxicity is measured by the concentration of parts per million (ppm) or milligrams per liter (mg/L) that kill a given percent of species being tested.
   - Lubricants must be rated "Practically Non-Toxic" or "Relatively Harmless."
3. ***Bioaccumulation*** – The build up of foreign chemicals within the tissues of a living organism over time.
   - Lubricants must not create bioaccumulation in living tissues or accumulate with an acceptable amount of risk as determined by the foreign European Ecolabels and allowable by the US EPA.

How is Your EAL Going To Handle Water Contamination?

EAL Product	Change in Acid Number mg KOH/g	Total Acidity of the Water Layer mg KOH
Polyalkylene Glycol (PAG)	-0.01	Water Solubilized
Polyalphaolefin (Bio-based PAO)	-0.08	6.9
Synthetic Ester	0.83	19.37
Vegetable Ester	2.02	3.23

Test Method – Hydrolytic Stability – ASTM D-2619 using 75g of fluid and 25g of water are sealed in a bottle then placed in a 200°F (93°C) oven and rotated for 48 hrs. Fluids that are unstable to water under conditions of the test form corrosive acids and insoluble contaminants. Reported values are Acid Number Change in the fluid, and Total Acidity of Water – *both equally damaging to components*.

US EPA Clean Water Act Also Requires That A Fluid Cannot Create Surface Sheen



Leading brand lubricants were photographed using a black light and an illuminating agent

Neptune® Series Lubricants Meet All US EPA EAL Requirements, Leaves No Surface Sheen, & is Water Soluble

American Chemical Technologies, Inc.
485 E. Van Riper Rd.
Fowlerville, MI 48836
Tel: 800-938-0101 ♦ Fax: 517-223-1703
Web: www.americanchemtech.com

Petrobras' P-55 FPU in Rio Grande, Brazil, where it was built to BV class.

What's new in November with Floating Production

By Jim McCaul, International Maritime Associates

Currently, 319 oil/gas floating production units are now in service, on order or being remarketed for reuse. FPSOs account for 66% of the existing systems, 73% of systems on order. Another 25 floating LNG processing systems are in service or on order. Liquefaction floaters account for 16%, regasification floaters 84%. No liquefaction units are yet in service – all 4 are on order. In addition, 102 floating storage units are in service, on order or available. (See table right)

Growing Number of Available Units

Sixteen production floaters (13 FPSOs, 3 Semis) are off field and being remarketed for redeployment. Another FPSO and an FSRU on order do not yet have a field contract – and a new FPSO just delivered to Brazil (OSX3) could come on the re-sale market as the field operator (OSG) has financially collapsed.

Trend in Inventory

The inventory of oil/gas floating production units is 15% greater than five years ago and 66% higher than ten years back. This comparison includes all units in service, on order and off field – but excludes LNG processing units. If the latter are included, the growth is 21% and 79% respectively.

Orders to Date in 2013

Since the beginning of the year there have been orders for 24 production floaters with a total contract value of

Number of Floating Production and Storage Units

In Service, On Order and Off Field/Being Remarketed (as of 1 November 2013)

	Total	Active	On Order	Off Field
Oil & Gas Processing				
FPSO	211	158	40	13
Production Barge	9	8	1	0
Production Semi	48	40	5	3
Production Spar	23	19	4	0
TLP	28	23	5	0
Total	319	248	55	16
LNG Processing				
FLNG	4	0	4	0
FSRU	21	8	13	0
Storage Systems				
FSO	102	94	7	1

~$19 billion. The orders include 11 FPSOs, 2 TLPs, 1 Spar, 2 Barges (1 oil/gas, 1 LNG), 7 FSRUs and 1 MOPU. Details for orders to date in 2013 are available at www.imastudies.com.

The pace of production floater orders thus far this year has been running above the long term average. Over the past 15 years orders have averaged 1.2 units per month. The order intake pace this year has been averaging 2.4 units per month.

But the market could be hitting resistance. FPSO orders in particular have been relatively weak. Over the past five years an average of 15 FPSOs have been ordered annually. At the moment it looks like this year will not reach this level of orders.

Backlog of planned floater projects – 218 floating production projects are in various stages of planning as of beginning November. As shown below, close to 60% entail use of an FPSO.

Planned Projects

by Type Production System Required
(as of 1 November 2013)

Type of System	# of Projects
FPSO	125
Other FPS	35
FLNG	21
FSRU	25
FSO	12
Total	218

Where Planned Projects are Located

Brazil is the major location where future floating production projects are in the planning stage. 22% of visible planned projects are located in Brazil. Several Brazilian projects will require multiple production units. Libra could require 12 production units, Jupiter 6 units, Lula 2+ units. When these large projects are taken into account, Brazil represents almost 30% of visible floating production system orders in the planning stage. A breakdown of planned floating production projects by location is below.

Location of Floating Production Projects

in the Planning Stage
(as of 1 November 2013)

Project Location	# of Projects
Brazil	49
Africa	48
SE Asia	34
No. Europe	20
GOM	18
Aust/NZ	15
Med	11
SW Asia	12
Other	11
Total	218

About IMA & Jim McCaul

IMA provides market analysis and strategic planning advice in the marine and offshore sectors. Over 40 years we have performed more than 350 business consulting assignments for 170+ clients in 40+ countries. We have assisted numerous shipbuilders, ship repair yards and manufacturers in forming a a plan of action to penetrate the offshore market. Our assignments have included advice on acquiring an FPSO contractor, forming an alliance to bid for large FPSO contracts, satisfying local content requirements and targeting unmet requirements through technology development.

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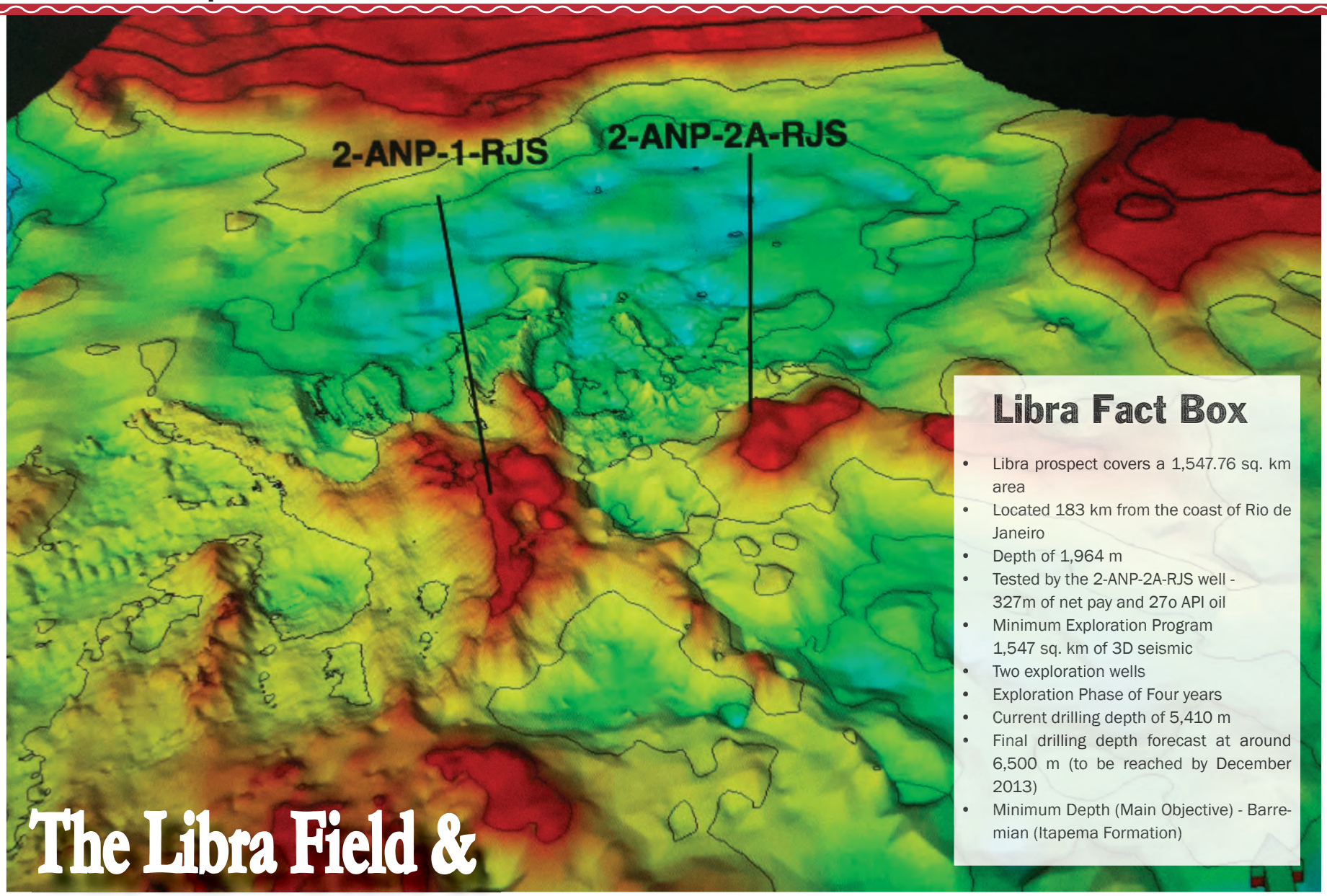


Libra Fact Box

- Libra prospect covers a 1,547.76 sq. km area
- Located 183 km from the coast of Rio de Janeiro
- Depth of 1,964 m
- Tested by the 2-ANP-2A-RJS well - 327m of net pay and 27o API oil
- Minimum Exploration Program 1,547 sq. km of 3D seismic
- Two exploration wells
- Exploration Phase of Four years
- Current drilling depth of 5,410 m
- Final drilling depth forecast at around 6,500 m (to be reached by December 2013)
- Minimum Depth (Main Objective) - Barremian (Itapema Formation)

The Libra Field & Brazil's Pre-Salt Policy

By Claudio Paschoa, Rio de Janeiro

Brazil's Libra pre-salt field, in Block SS-AUP1 in the Santos Basin, with estimated recoverable oil volumes of 8-12 billion barrels of oil equivalent (BOE) and in place volumes of between 25-40 billion BOE, was the country's first pre-salt field to be auctioned. The rules governing this historical auction have been shunned by important super-majors such as Exxon Mobil, Chevron and BP and also by major players such as the BG Group and Statoil. Many industry analysts were surprised that state-owned players from China, India and Malaysia dominated the list of companies that have agreed to the controversial terms imposed by the Brazilian government, through its National Petroleum Agency (ANP). Magda Chambriard, head of ANP, said that she had expected "more than 40 companies to bid for Libra," expressing surprise at having only about a quarter that interest actually materializing. She may well have been surprised, but it is highly doubtful that the policy making nucleus in Brazil's government was in any way surprised, as the state policy is to maintain tight control over pre-salt E&P. The new rules being implemented for this auction, such as Petrobras being the sole operator of the field and having a minimum 30% stake in any consortium, along with the highly criticized decision to create another state-owned company, Pré-sal Petroleo S.A. (PPSA), to act as manager of the winning consortium without imputing capital and having 50% vote in the Operational Committee's deliberations, along with veto rights, are a reflection of the government's policy.

Local industry analysts, who asked to remain unnamed, maintain that these and other new rules such as the production-sharing scheme were designed to attract other state-owned players, in detriment to the international super-major players, which are mostly private companies. The reasons for this preference is that these state-owned players participating in the auction, having significantly less, if any, experience in operating deepwater pre-salt fields, are therefore more agreeable to Petrobras' operational control and the significant fact that these state-owned players are more interested in obtaining the physical oil than in the profits from oil sales because they need the oil for their own national development.

Eleven companies agreed to the auction terms and paid the roughly $1 million participation fee, after which they received the data package concerning the Libra field. Of these 11 companies, seven can be considered super-major players because of their market value, according to Bloomberg/PFC Energy estimates as of December 31, 2012. The fact that they paid the participation fee does not necessarily confirm that they would definitely participate in the auction, and the payment fee was compulsory and individual to each company, even those wishing to submit bids through a consortium. Therefore, some of the com-

panies listed could choose to forfeit the fee and not participate in the auction, and one did just that; Repsol pulled out of the auction at the last moment. Additionally, Mitsui and Petronas failed to deposit financial guarantees, thus withdrawing participation rights. With the high investments involved, which include EWTs and other field development costs, along with around $7.5 billion as bonus on signing the 35 year long, nonrenewable E&P contract, virtually guaranteed that the companies involved will form consortiums, with no company competing individually. The ANP has estimated that it could take as much as $183 billion to develop the Libra field.

When the rules were changed in 2010, many local and international oil industry leaders and analysts expressed concern that the production-sharing model would reduce investment interest in Brazil's pre-salt provinces, which include areas in the Santos, Campos and Espirito Santo Basins. After the rules were confirmed for the Libra auction, more than 200 requests for changes were made and turned down by the ANP, who said the area's size and potential meant that the government could charge almost anything it wanted for the rights. "Libra is beyond any possible comparison nowadays to other fields," said Magda Chambriard during a global road show to promote the auction.

"If companies participate, it is because they see potential value. This is the biggest auction in 30-40 years around the globe."

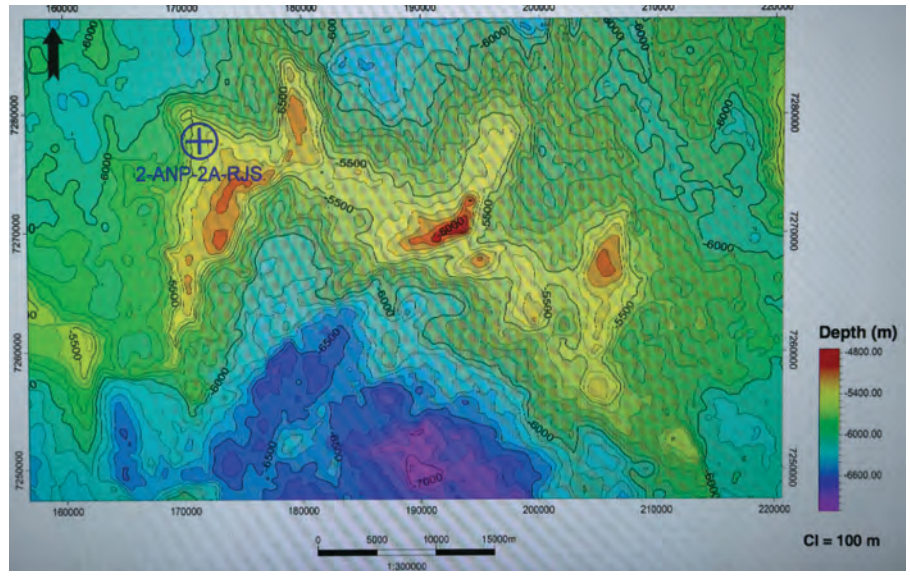
Brazil's government expects to receive around $300 billion in royalties and other taxes from Libra over 30 years.

(Photo Tania Rego)

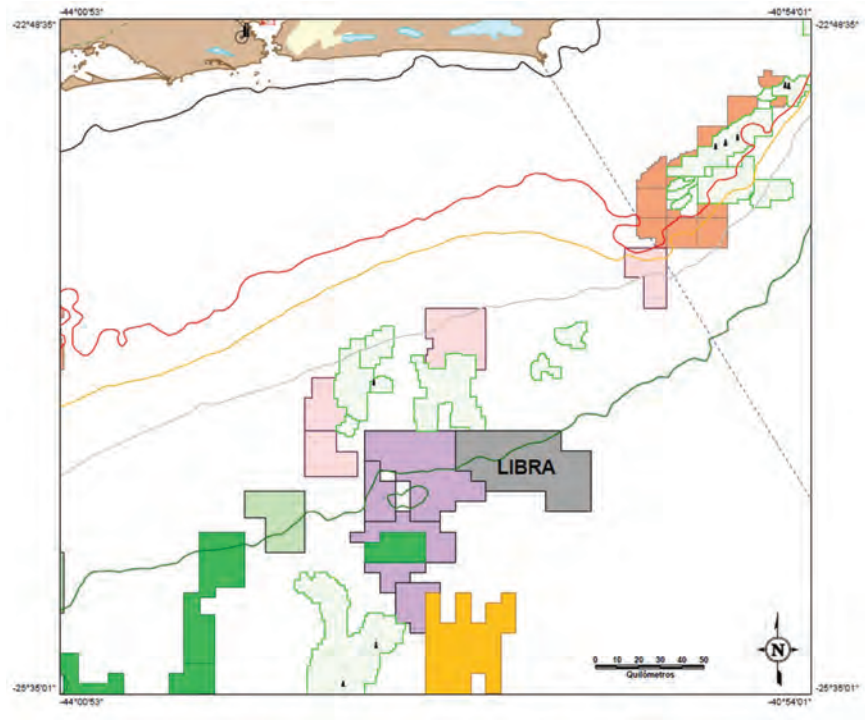
Graça Foster, President, Petrobras

(Photo Alberto Stuckert Filho)

ANP Director **Magda Chambriard** (left) and Brazilian President **Dilma Rouseff** (right).



(Image ANP)



(Image ANP)

Top Right: Structural Depth of Base; Bottom Right: Salt Libra map.

Oil rights in the rest for Brazil's post-salt plays will continue to be sold on a concession basis, where oil companies own all the oil, but pay royalties of at least 10% on production. João Carlos França, President of the Brazilian Petroleum Institute (IBP) had this to say: "What surprised me was Exxon not participating. But every company has its strategy. Libra is very large; it demands high investments, with high risk and many regulatory uncertainties in the sharing model. It's not known how the PPSA will perform managing the fields. It's a great doubt."

The PPSA organization may be viewed with skepticism and considered a risk by some, but the fact is that the company was created specifically to manage the pre-salt resources efficiently. The risk is still there, yet by choosing a CEO with a technical background instead of a political appointee, President Dilma Rouseff showed how seriously the PPSA is being taken by the Brazilian government. This is an important indicator that the government expects the PPSA to keep a tight managerial and supervisory control over the winning consortium to guarantee that the oil costs (the costs related to oil production) do not skyrocket, which could adversely affect the amount of oil delivered to Brazil and the winning bidders.

Local content requirements for equipment and services also pose serious concerns to major players. According to executives from major oil companies operating in Brazil, there is a growing fear that local industry will not be able to fulfill demands and meet deadlines, thus slowing down Libra's development and possibly even delaying Libra's production startup, which would also delay any profit gains. By contract, the minimum local content during the exploratory phase is set at 37%. During the EWT, this drops to 15%. For the development phase modules to begin by 2021, local content requirements reach 55%, and for development phase modules beginning in 2022 this increases to 59%. President Dilma Rouseff announced in September, that the development of the Libra pre-salt field would require between 16-18 new rigs or FPSOs to reach the goal of producing 1 million BOE per day. This goal has since been raised to 1.4 million BOE per day. Between 60-90 support vessels are also forecast to be required. This will be a major boost to the already thriving Brazilian shipbuilding industry which has reached a workforce of roughly 70,000, up from an all-time low of only 2,000 workers at the turn of the century.

The President of PPSA will be Oswaldo Antunes Pedrosa Jr. He is a 63 year old engineer with a PhD from Stanford. Pedrosa worked for 30 years in Petrobras, where incidentally, he was chief of current Petrobras President, Graça Foster. After retiring from Petrobras he joined the ANP at its inception in 1998. Since 2010 he has been working with HRT O&G as Executive Director of the Polvo field, where HRT hold a 60% stake. "There needs to be a convergence of interests between the PPSA and its partners, including Petrobras as pre-salt operator." Pedrosa said. "We also have to supervise the operator in order to guarantee that the main objectives of a company of this nature are reached. The main objective is to maximize the results for both the partners and the state. Now, during our operation, there will always be managerial conditions and procedures, which will allow the PPSA to reach high level agreements with the pre-salt operator, which is Petrobras."

Libra Auction Result

With the first pre-salt auction scheduled to take place at a hotel located in Barra Beach on the west side of Rio de Janeiro during a commercial holiday on Monday, October 21, the Brazilian government made comprehensive security plans to impede demonstrators from reaching the event venue. Worker and teacher demonstrations have been commonplace in Brazil during the last few years, although they usually end in some form of confrontation with security forces. Before the bidding round started, there were demonstrations by oil workers and others totaling around one hundred people, about 500 meters from

the venue, where the security cordon was placed. There were also confrontations with some demonstrators, and some of the 1,100 soldiers used as security suffered injuries.

Back at the event venue at the Windsor Hotel, there was a bit of an anticlimax, as in the end only one consortium deposited its bid in the ballot. With the lack of competition, the consortium comprised of Petrobras (10%), Shell (20%), Total (20%), CNPC (10%) and CNOOC (10%) offered the established minimum 41.65% in profit oil to the federal government, winning the first Pre-salt bidding round held by the Brazilian National Petroleum Agency (ANP). With the established a 30% stake to be acquired directly by Petrobras, the National Operator's total participation in the consortium will be 40%. A signature bonus of around $7.5 billion is to be paid by the winning consortium in a single payment, and the total amount payable by Petrobras will be around $3 billion relative to its participation in the consortium. The contract states the block exploration phase will last four years. The minimum exploratory program, to be carried out during this period, includes 3D seismic for the whole block, two exploratory wells and 1 extended well test.

Petrobras highlights that recoverable oil volume estimates, costs, investments and schedule of the production systems of this block will be progressively released in a timely manner as the minimum exploration program is developed.

The national operator believes that the integration of expertise and experience of the European partners, Shell and Total, with their wide expertise in deepwater development and by their long experience in managing the design and implementation of large projects, will contribute to achieving good production results in Libra. The participation of the Chineses companies, CNPC and CNOOC, complements the requirements for a strong and active consortium, leveraged by the financial strength of the Chinese companies. Peter Voser, Chief Executive Officer of Royal Dutch Shell, said, "The Libra oil discovery in Brazil is one of the largest deep water oil accumulations in the world. We look forward to applying Shell's global deep water experience and technology, to support the profitable development of this exciting opportunity."

Brazilian President Dilma Rouseff, commenting on the complaints being made by the nationalist demonstrators, said, "According to the auction results, 85% of the total profit to be produced by the Libra field will be owned by the Brazilian State and Petrobras. This is very different to privatizing."

He added, "Brazil is and will continue being a country open to national or foreign investment, which respects contracts and preserves its sovereignty. For

Companies in first Pre-Salt Auction

- CNOOC International Limited (China)
- China National Petroleum Corporation (CNPC) (China)
- Ecopetrol (Colombia)
- Mitsui & Co. (Japan)
- ONGC Videsh (India)
- Petrogal/Sinopec (Portugal-China)
- Petrobras (Brazil)
- Petronas (Malaysia)
- Repsol/Sinopec (Spain-China)
- Shell (Holland)
- Total (France)

Consortiums will be composed of a maximum of five companies.

(Source: ANP)

Warty comb jellyfish (Mnemiopsis leidyi) float in the water with a larger jellyfish and over some crabs on the seabed, Egersund, Naalaugvika, South West Norway. Comb jellyfish are amongst many species that are typicaly sucked in as ballast water for boats and ships.

On Ballast Water, Time is Running Out

By Alan Johnstone

The MEPC 65 resolution was meant to help facilitate the long-awaited ratification of the IMO's Ballast Water Management (BWM) Convention. But has it actually done more harm than good? The ballast water treatment supplier sector and environmental lobby are unequivocal in their assessment. Alan Johnstone reports.

"My initial reaction was guarded, but hopeful," confesses Lars Erik Mangset of the WWF, when asked about his response to the MEPC 65 draft resolution on ballast water in May.

"Retrofitting existing vessels with ballast water treatment (BWT) systems was always one of the key hurdles on the road to ratification of the BWM convention, so if this was addressing that concern for shipowners then we could accept it. With this resolution we thought, 'right, there's no more excuses'."

It appears he's no longer quite as hopeful, as he adds with a sigh: "But what has happened since? You tell me."

That's a challenge that Tore Andersen, the CEO of ballast water treatment (BWT) system specialist Optimarin, is keen to take on.

"On the order front, very little," he admits candidly, "especially with regards to retrofitting. But there is movement in the sector – movement of the wrong kind. And the MEPC 65 resolution, which is yet another chapter in a long running saga defined by on-going uncertainty and frustration, has to take some responsibility for that."

The Long Road to Ratification

The long running saga Andersen references is the glacial progress of the IMO's Ballast Water Convention, introduced back in 2004. And, with only 37 countries representing 30.32% of the world's tonnage having ratified the convention to date (35% is required), it looks like it may run on for some time yet.

As Mangset points out, MEPC 65 was meant to change this, effectively relaxing the deadlines for the installation of BWT systems (recommending that ships built prior to ratification need not install systems before their first renewal survey after that ratification).

When the resolution is passed in November it will give shipowners, in some cases, years of previously unexpected breathing space to plan retrofit installations across their global fleets.

"That's far from ideal," Mangset states, "but it is manageable if it's coupled with concerted political action to convince some of the remaining major flag states, like Panama, to climb on-board the ratification process. It needs to be a balancing act."

Unfortunately, as he sees it, the scales have been tipped very heavily to one side: "There's been no action," he stresses, "which sends out entirely the wrong message to the industry."

Something that Andersen and his peers in the BWT sector can attest to.

The Threat of Inaction

"There's more and more of a 'well, let's just wait and see what happens' mentality, and that is beginning to undermine our industry," notes the Optimarin boss.

To consolidate this point, Andersen nods in the direction of Desmi. The pump solutions specialist announced in mid-September that it was to cease offering customers its Desmi Ocean Guard BWT system due to market "uncertainty" and the aforementioned "wait and see attitude." An official release from the firm said that it would now concentrate its efforts on "the sale of our other products focusing on green technologies" but expects to return to ballast water "as the market matures."

"That is a real shame," Andersen states, "but at least a business of their nature has other divisions and technology to fall back on. BWT specialists like ourselves – remember we've been working on this since 1995 and installed the world's first commercial BWT system in 2000 – don't have that. This is our exclusive focus."

Optimarin has invested what Andersen

"Five or six years ago, the main argument against ratifying the convention was the lack of technology on the market. Well that is no longer the case; there is now a good commercial environment, with a variety of solutions."
(Such as Optimarin BWT System, pictured below)

Lars Erik Mangset, WWF

calls "considerable sums" in developing its simple, reliable and easy to install filtration and UV irradiation system, emerging as a leader for vessels up to approximately 60,000dwt. It boast sconfirmed orders for 250 ships and has installed around 100 systems, with further "considerable sums" spent on ensuring that these units are all DNV, IMO and US Coast Guard approved. But Andersen said, "It is worrying, but more than anything else it's hugely disappointing."

A sentiment shared by Mangset.

"Five or six years ago, the main argument against ratifying the convention was the lack of technology on the market. Well that is no longer the case; there is now a good commercial environment, with a variety of solutions (an estimated 40 systems are now approved by the IMO).

"However, as we're seeing now, the longer the ratification process takes, the greater the sense of uncertainty and the greater the threat to those suppliers. This puts the further technological development of solutions at risk, while the withdrawal of suppliers weakens the sector and provides less options for shipowners, who may therefore delay their decision making even further."

This, he states, is not what the industry needs… and as for the environment…

Silent Invasion

The damage to the sector is one thing, the catastrophic on-going impact of untreated ballast water on marine ecosystems around the world another. Mangset calls ballast water "the second biggest threat to global biodiversity after climate change."

He explains: "Each year about 10 billion tons of ballast water is transported around the world, with around 7,000 marine species carried every single day in ballast water tanks.

"These species, often aggressive and fast-producing, can out compete native flora and fauna when deposited in untreated ballast. Back in 2009 we conducted a study that found that 84% of the world's 232 marine eco-regions had reported findings of invasive species, with international shipping being the primary pathway for pest organisms. The damage being inflicted on a daily basis, right now, is just breath-taking."

Mangset says that the same report found that between 2004 and 2009 the spread of invasive species had resulted in global economic losses of around $50 billion (2004 to 2009). Losses came not only from depleted fish stocks, but also from damage to local environments, infrastructure and industry (the Zebra Mussel is a case in point, with the Eastern European invader causing havoc in the US by blocking up water inlet pipes for coal-fired power stations, costing the energy industry tens of millions of USD every year).

Need for a New Impetus

"But despite this colossal damage," Andersen says, as he moves onto the green cause, "there is no real political impetus to ratify the BWM convention and finally stop these invisible invaders. Many of the remaining major flag states, who could push the convention across that 35% boundary overnight, are quite simply not taking responsibility and signing up."

In the face of the never-ending delays, Andersen says that more could be done to protect both the environment and the shipowners that are forward-thinking enough to invest in BWT systems pre-ratification. He believes that introducing 'grandfather clauses' is one way to stimulate activity.

"Grandfather clauses that protect the investments of shipowners would really help," he notes. "Then, if regulations and standards were to change and become more exacting, the ships that were already fitted with BWT systems would be exempt. That would tackle the sense of uncertainty and encourage shipowners to take responsibility for their ballast water today.

"With each further day of procrastination the damage amplifies – to the environment and the industry. It's the invasive species that should be at threat by now, not the ballast water industry itself."

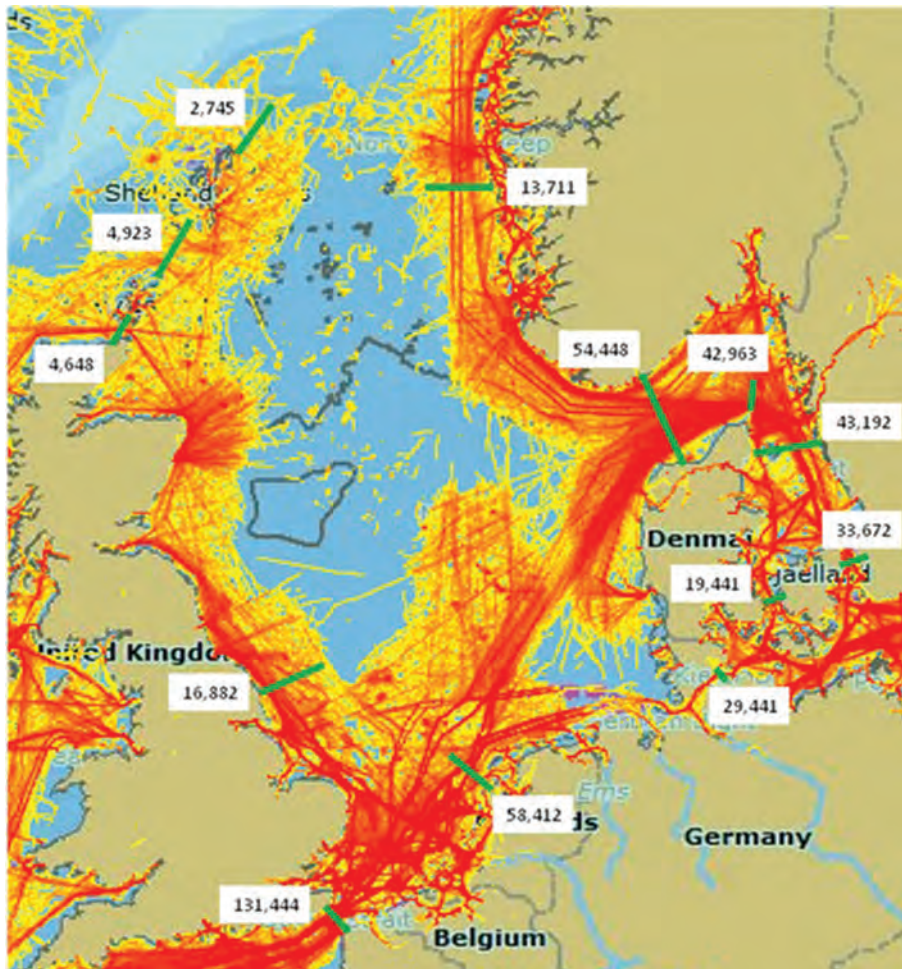
Simulation runs, conducted by ACCSEAS, putting the mariner into a potential future of an e-Navigation environment, including the integration of route recommendation from a shore-based coordination center

Standardization for Safer Shipping of

e-Navigation & Training

By Dr. Michael Baldauf, Associate Professor at World Maritime University

e-Navigation aims to harmonize navigation systems and ultimately make the mariners' job easier, but its implementation will necessitate extensive changes to maritime training. Dr. Michael Baldauf of the World Maritime University, discusses the reasons for change, progress made so far, and further changes that will need to be made to reap the benefits of e-Navigation. In recent years, bridges have become increasingly 'smart' with a plethora of new equipment, systems and interfaces. New pieces of navigation equipment and sophisticated systems have been introduced both onboard and ashore, primarily to improve safety. New equipment such as Automatic Identification Systems (AIS), Voyage Data Recorders (VDR), Simplified Voyage Data Recorders (S-VDR), Integrated Navigation Systems (INS), Integrated Bridge Systems (IBS), and numerous others, are found on state-of-the-art navigational bridges, providing the mariner with vast amounts of useful information. Indeed, some of these tools are mandatory for vessels from regions covered by the International Convention for the Safety of Life at Sea (SOLAS).



Shipping traffic density in the North Sea Region. The labels show the total number of ships passing each line from both directions during 2012.The yellow to red colour gradient shows the relative density of shipping in the NSR. The empty area in the middle of the North Sea as well as in the German Bight, are areas without AIS coverage (it does not mean that there is no traffic).

The advent of Electronic Chart Display and Information Systems (ECDIS) was a major cornerstone but, in order to ensure that all electronic equipment works and performs optimally, it must be integrated under an overarching framework - just as all of the instruments in a large orchestra need to be tuned and harmonised to produce a good overall effect. This is what e-Navigation, a concept developed by the International Maritime Organisation (IMO) together with the International Association of Lighthouse Authorities (IALA), plans to achieve by standardising navigational tools in an all-embracing, over-arching system.

e-Navigation will bring together disparate systems, making the mariner's job easier and subsequently, enhance navigational safety and efficiency. It will connect ship and shore by powerful communication systems and help all the operators on board - captains, pilots, navigating officers, engineers, as well as the vessel traffic service (VTS) and search and rescue operators, to effectively fulfil the tasks they are responsible for.

Education and Training Before e-Navigation

Before e-Navigation, the introduction of new systems into shipping was accompanied by related training measures. The IMO laid down all of the minimum requirements for seafaring personnel in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). While this established the basic minimum requirements, Model Courses with specific training requirements were defined for special purposes and particular equipment. For example, the ARPA/Radar Model course or the ECDIS Model course, has become mandatory for navigators. Manufacturers and suppliers of navigational and technical equipment offer specific training courses for users to support the effective operation and handling of their systems in practice, but these systems are not standardized and therefore neither is the training on them. Mariners may be able to use equipment from one manufacturer, but not from another. This could have an impact on their career progression, as their experience and training may be not be interchangeable with those needed to operate other vessels. There are also significant safety implications of not being trained properly on the equipment they are operating.

The Impact of e-Navigation

So what impact, if any, has the introduction of the e-Navigation concept had?

ACCSEAS, a European project that is developing and implementing a practical e-Navigation test-bed to harmonize the exchange of electronic maritime information, has been assessing the impact of e-Navigation so far by conducting interviews and simulation runs with experienced mariners. Over the last year, ACCSEAS has conducted several simulation sessions, putting mariners into a potential e-Navigation environment with aspects such as the integration of route recommendation from a shore-based coordination centre. Mariners were also interviewed about their knowledge and training experience of e-Navigation.

The interviews showed that, while e-Navigation has a worldwide community, knowledge of the concept is still at a rather low level. Almost all of the interviewees had received no training in the concept of e-Navigation and the closest e-Navigation came to be mentioned was briefly as a part of BRM (Bridge Resource Management).

Most interviewees had learned about the concept from articles in industry magazines and journals, therefore most were self-informed rather than having undergone any specific training. More surprisingly, teachers and lecturers at recognized maritime education and training (MET) institutions were not fully aware of e-Navigation. While interviewed mariners expressed their wish to be informed and educated before the introduction of the e-Navigation based new systems and concepts, most of the maritime universities, academies and other training institutions consulted said it is largely not a subject of training modules, lectures or other types of courses at all.

(Continued on page 67)

For Ashley Wilber, apprenticeship training & academic degree is the

Pathway to Success

__Edward Lundquist__ talks to welder and apprentice instructor __Ashley Wilber__ at BAE Systems Ship Repair's Norfolk shipyard.

Tell me how you came to be a welder here at BAE Systems Ship Repair.

I have been here at BAE Systems going on seven years now. I was just doing odd jobs out of high school – Hardee's, driving jobs like delivering pizzas – anything that was making money. I have a cousin, who at the time was an electrician apprentice, and he was telling me about the shipyard. I'd never heard of a shipyard even though I drove past it all the time. I would always look to see if the Disney boat was in the dry dock. I'd say, "Hey, that's Mickey Mouse. What is it doing in there?" I just never knew what it was.

My cousin told me about the apprenticeship program, and how it was a good opportunity—you go to school, work and get a paycheck. It sounded like something to look into, so I began to research each trade to see what was in high demand and who was hiring for that trade at that time. If things didn't work out at the shipyard, would I be able to find work? I applied and was accepted. I decided that welding was what I really wanted to do. I was selected, went through my four years, and graduated from with my Associate's Degree in Maritime Technologies from Tidewater Community College as valedictorian. I was also Virginia Ship Repair Association (VSRA) Junior Tradesman of the Year for the area.

My instructor was my mentor. He was very knowledgeable, and I really looked up to him. Working with him, I was trained and certified as an aluminum welder, and assigned to do 5 XXX critical welding on the cruisers. I became a crew leader directly after graduation. After a couple of months of being a crew leader, I was designated "STRIPES," which is a supervisor lead person; and a couple of months into that, I was working on the LHDs – the big deck amphibious ships – doing aluminum foundations. The company sent me to Hawaii for five and a half months to help with the removal and replacement of uptakes on the USS Port Royal and USS Chosin. I was a welder on the Port Royal, then a supervisor on the Chosin, and led the crew out there. We finished a couple months ahead of schedule; I was very proud of how that

job came out. When I returned to the yard in Norfolk, I wanted to see what it was like on the other side of the "green line." In the shipyard, there's a green line literally painted on the ground. On one side is the production area where you have to wear all of your safety and personal protective equipment. The other side is the offices, and guys that get us the work out here on these ships.

So you took an office job?

I applied to be a contract estimator, and got a position estimating on government contracts. A lot of times, as you get into the availability, a job will grow, and requires additional funding. I would estimate it, and negotiate a reasonable price with the customer to fix that certain item. But after about nine months I realized that I still wanted to weld, and be a part of the weld shop. The desk was not for me. Sadly, my mentor passed away and his position became open. My instructor motivated me, pushed me through and showed me some good skills that I felt I could pass on to the up and coming apprentices. I talked to the head of the shop and told him I really wanted to be an apprentice instructor. I was chosen for the position. Now I'm an apprentice instructor and a craft supervisor. My first priority is the apprentices, but I also help out with certain jobs on the ships, and maintain procedures and certifications, and I certify everyone in the yard who is qualified to weld—subcontractors, welders, ship fitters, and mechanics. If you are going to weld any type of material, you come through me first. We are in the process of getting new procedures and certifications so we can be able to weld different things—the more we can weld, the more work we can get.

When you are instructing apprentices, do you have anything to do with their classes at school?

I am involved as far as keeping them up on their grades, their attendance and their studies. If I get a report that a person is not doing so well, I pull them in and talk to them, and let them know about tutoring or other classes or resources that are available to them. They have core classes such as English, reading, and math. The apprentice program trains you for leadership, with public speaking classes along with Excel and PowerPoint. But when you first get into the program you also have a class called "Ships Nomenclature." For me, since I had never been on a ship, this class was my first introduction to the shipyard. I learned how to get around on a ship, tie knots, and basic safety practices. Some people take it lightly, but it's a very important class, and if you have never been on a ship, it's vital.

What's involved with the welding school, and what do you teach there?

The company made a significant investment in a new training facility. My apprentices rotate through the weld school every six months and receive different certifications each time. Mechanics that come through are given the same training and guidance as an apprentice, just in a shorter time. I train them all to do good quality work on the vessels.

Is it a case where some people pick

things up faster, and others may take a little longer to get certified?

Some need a little extra guidance. That's why they come to the school. I don't hesitate to grab my welding gear and give them a demonstration of what I expect of them.

So a welder here at BAE Systems Ship Repair doesn't specialize as an aluminum-only welder, or a steel welder.

They're going to learn how to weld steel and aluminum. The more certifications you have the more flexible you are. If we feel you're capable of receiving a certification, we go ahead and try to give it to you. Some have a harder time grasping a concept, so we let them work with what they have and try for additional certifications at a later time. Aluminum takes more skill and patience than standard steel certifications.

Why is aluminum harder?

The testing is much stricter. For example, when they conduct NDT—nondestructive testing—they put dye penetrate on it and if it bleeds through, then it's a bad weld. Steel is not as strict. Some ships have superstructure made out of aluminum, and with all the twisting and turning from the ship, that soft material cracks easily. Aluminum is a lightweight, soft, low strength metal. Every time you get a ship in here it's going to have some aluminum cracking. The processes we use to weld aluminum gives you a highly concentrated heat zone to prevent distortion.

As a craftsman, what's the difference between welding steel and welding aluminum?

With steel, you can weld, clean it and get your supervisor to do a visual test and you can walk away. Aluminum is a completely different material; and it's inspected to a higher standard than steel. It has to be good, sound metal; look good; be clean; and stand up to the non-destructive testing process. It's just not getting a visual inspection, they're actually conducting test. With 5XXX aluminum, every weld pass has to be checked by a QA inspector, which takes more time to finish the job. If it is not done properly, it will show. Basically, there is no way to cover up bad welding with aluminum.

Do you use robotic welding?

We have machines—called Moggies—in the shop that we were testing and getting certified on to weld different material in different positions. We have an aluminum Moggy for our big inserts. The way it works is you set it up, set the temperature and put it on track and instead of someone sitting there taking three days to weld it by hand; you can take a few hours and get the job done right and in less time.

"Welding is my passion. If I'm not welding, I would like to help someone else learn how to weld."

Do you still need a certified welder to set that up?

You have to be certified. We go through the whole process of checking every layer as if it was on the ship as a critical weld in a controlled environment passing the non-destructive testing. The yard itself is certified and we do have certified mechanics.

So that would be something that you would do in a fabrication shop before you bring it over to the ship.

Yes. We have a fabrication shop in the yard where we put together a lot of big pieces then take them to the ship to be installed.

What do you find to be the most challenging part of teaching welding?

The different people . Everyone has different personalities, and they learn at a different rate. What one person may get, others may not, so you have to spend more time with them. Sometimes an apprentice does not understand a particular certification and I have to skip over that procedure with them. I research different ways of explaining and teaching different processes. I don't know it all and I have to do my own research. So if I have a person that's struggling on one thing and I feel that I'm not getting through to them, then I will try to find a different way to show them that they may grasp.

What do you find most gratifying about teaching apprentices?

When they get it after I have shown them different ways of approaching it. When they pass the test, they smile and feel good about themselves—it's like a kid at Christmas. I feel good because I helped them do something that they are proud of. I feel like I've had a good day if I helped at least one person.

What do you see for you in the future?

I'm not sure. I've already been over in the office, but I wasn't ready to get away from the shop. I wasn't ready to leave welding. I still go on the ships regularly and might come back over the green line, you never know. But for now, I'm happy where I'm at. Welding is my passion. If I'm not welding, I would like to help someone else learn how to weld.

Do you see a greater influx of women getting into the program?

As far as welding goes, I have seen it grow in the apprenticeship program. We've gone from one to two females, and now we have five. I see it continuing to grow. They say females make better welders, anyway. We have a steady hand.

I think over the years people think of welding as a man's job, but people are now realizing that it's a profession, a trade that anyone can aspire to. So what would you say to somebody who was thinking about becoming a tradesperson, perhaps in the ship repair, ship building industry?

Do your research. Look into it and make sure that's what you want to do, especially working in the shipyard. You're outside working in the elements. You might get wet, and maybe you can't weld that day. You're producing heat, and maybe it's already 90 degrees out there. So you have to be prepared for it. Some people think about welding equals money. That's all good and fine, but you have to like what you're doing first; you have to want to learn; and you have to get good at it so you can make money. You have to have that passion. You have to get into it.

Is welding something that virtually anyone can learn, or do you need to have an aptitude for it?

If you asked me this a couple years ago, I would have said anybody can weld. When I was an apprentice, and would go out on the boat, and all around me were guys that could weld; who had passed the test; and had the experience. But now, as an apprentice instructor and seeing students come in straight from high school, or maybe different companies where they did more book work and not so much hands on welding, I see now that it's not for everyone.

Do you ever sometimes think about what you would be doing if you hadn't become an apprentice here?

I would probably be looking in the paper for a job, seeing who is paying the most. I don't know. I do know I'm glad I am here at BAE Systems at this point in my career. I would not want to be anywhere else right now.

(Continued from page 63)

In this research, ACCSEAS found that ship operators would like to have harmonization of alarms and warnings when navigating in shore-based monitored areas. For example, warnings triggered by a collision and grounding avoidance system ashore must be harmonized with the system onboard in order to avoid confusion and delay. As a minimum, the training and education of users both onboard and ashore should be complementary.

Interviewees also supported the idea of standardized human-machine-interfaces, which they think would help to make training more effective and efficient than it is today. Greater standardization would mean that mariners are able to safely use systems, even if unfamiliar with them - much as the standardization of cars has meant that anyone who has learned to drive can safely operate any model of car.

There has been little change in training since the concept of e-Navigation was introduced. It is clear that new training requirements need to be implemented for e-Navigation, which introduces new applications such as enhanced anti-collision displays, dynamic tidal and current information integrated into ECDIS, as well as completely new services like route broadcast and route suggestion services for enhanced traffic management and coordination. Equally as important, navigators will need to be trained on the constraints of these systems, how to spot errors, and how to interpret warnings and alarms. Captains, pilots and navigators must be much more aware of the limits of any system used for navigation. VTS operators must take care when broadcasting information gathered from shore based sensor systems and inform the users of the reliability of the given information accordingly. This will hopefully combat an existing over-reliance on systems, which can cause mariners to miss important changes or warning signs. It's likely to get harder before it gets easier as, before harmonized systems can be universally implemented, the e-Navigation community will need to decide on the standards, enforce them, and ensure all mariners are trained on them. The long-term training implications of e-Navigation, however, are positive. A higher level of standardization on navigation systems will lead to more standardized training, and this will be easier for the navigation community to provide and enforce in the future, and simpler for the mariner to complete.

The role of the ACCSEAS project primarily is to assess where there are training gaps and understand how training can be improved and made accessible to the mariner. It aims to develop and offer supporting training materials for all of the services designed within the e-Navigation test-bed and actively make these available to the shipping community.

About the Author

Dr. Baldauf is Associate Professor at World Maritime University and the Chief Instructor of Maritime Simulation researches on training needs and gaps related to e-Navigation. This research is carried out under ACCSEAS, an EU-funded research and development project.

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The Drawing Board

Innovative OSV Design from the ground up

The offshore market continues to be a significant driver for marine innovation, as vessels and their operators are critical factors to ensure that offshore operations – increasingly conducted in deeper, more hostile waters further from shore – are conducted in a safe and efficient manner. Here Maritime Reporter examines some notable recent designs, developments and deliveries.

Eastern Shipbuilding Group, which has been extremely busy of late in the offshore sector, delivered M/V HOS Red Rock (Hull 202) to Hornbeck Offshore Services, LLC. Hornbeck's first vessel, the HOS Red Dawn (Hull 201), was delivered on June 21, 2013 and is currently servicing offshore drilling operations in the U.S. Gulf of Mexico. Hornbeck's third vessel the HOS Renaissance (Hull 203) and is currently at Eastern completing final outfitting, regulatory and DP-2 trials. Delivery of the HOS Renaissance is scheduled for November 2013. The HOSMAX 300 Offshore Support Vessels feature the following capacities:

Total Fuel Oil Capacity	241,141 USG
Fuel Oil Day-tanks	20,190 USG
Drill Water/Ballast Capacity	562,822 USG
Potable Water Capacity	57,494 USG
Liquid Mud Capacity	20,846 bbls. 10 tanks
Dry-bulk Mud	14,347 cuft. seven tanks
Methanol Capacity	1,605 bbls. two tanks
Clear Deck Area	10,585 sq. ft.

HOS Red Rock is the second of four vessels designated as the HOSMAX 300 series by Hornbeck Offshore and are Diesel-Electric powered, twin Z-drive propelled OSV's measuring 292 x 64 x 24.5 ft. These high-tech vessels feature four Caterpillar 3516C 16-cylinder turbo-charged Tier III diesel generator engines each rated at 1,825 kW at 1,800 rpm. Main propulsion power is provided by two GE Energy furnished Hyundai 2,500 kW 690VAC electric motors driving two Schottel SRP 2020 FP Z-Drives with nozzles rated at 2,500 kW at 1,025 rpm each for a total of 6,704 Hp.

Schottel also provides two STT 4 fixed pitch tunnel thrusters rated at 1,180 kW at 1,170 rpm, each with direct coupled Hyundai 690VAC electric motors. GE Energy Power Conversions provides the complete system integrated diesel electric package, including the propulsion and thruster drives, motors, control systems, DP system, switchboards, motor control centers, automation and navigation/ communication electronics. These vessels are capable of a maximum speed of 14 knots with a cruising speed of 12 knots. The fully integrated bridge is arranged for increased visibility and features the latest technology in navigation, communication equipment.

The remaining six OSVs under contract are 302 x 64 x 26 ft. designated HOSMAX 310 Offshore Support Vessels. The total below-deck capacities of the HOSMAX 310 include 285,649 gals of diesel fuel, 609,227 gals of drill/ballast water, 21,509 barrels of liquid mud, 14,347 cubic foot of dry-bulk mud, 2,212 barrels of methanol and 62,538 gals of potable water.

Ulstein's latest design contract for Vroon Offshore Services pushes the total number of offshore ship designs sold from the firm past the 100 mark. This milestone has been achieved in 14 years, with 74 of the contracts signed for the company's X–BOW design, launched in 2005.

In total 25 different ship owners have ordered Ulstein designs, with 16 different shipyards building the vessels. Ulstein said 62 have been built at yards worldwide, while 38 have been built at Ulstein's yard, Ulstein Verft, on the west coast of Norway.

The latest contract on two PX121 PSVs (ship numbers 100 and 101) that was ordered by Vroon Offshore Services (Netherlands), will be constructed at COSCO (Guangdong) shipyard in China. The vessels are destined for European waters.

Although Ulstein's latest designs were introduced in 1999, the company has a history of developing ship designs that stretches back to the beginning of the 70s (its UT-designs, later sold out of the group, made an early impression). Ulstein contends that 2005 was the year that the global shipping market really "woke up" to the X–BOW design.

This X-Bow design, first seen on the AHTS Bourbon Orca, is designed to reduce movements and eliminates wave slamming and bow impact, stabilizing the work platform and improving comfort on board.

The lines of the hull create tangible performance benefits, with positive effects on fuel-efficiency, speed and motions, which extend the operational window, especially under poor weather conditions and in rough seas, Ulstein said. Test results show

(Photo: Eastern Shipbuilding)

Eastern Shipbuilding Group delivered M/V HOS Red Rock (Hull 202) to Hornbeck Offshore Services, LLC.

that the shape of the hull reduces power consumption by 7-8% compared to vessels with conventional hull lines.

Leevac recently launched the new Platform Supply Vessel (PSV) MV Torrens Tide at the company's Houma shipyard. The Torrens Tide is a MMC-designed 879 Platform Supply Vessel that will be certified for worldwide operations. Chris Vaccari, owner and CEO of LEEVAC, says the Torrens Tide is a unique project for LEEVAC Shipyards as the vessel was relocated from Tidewater's Shipyard in Houma to LEEVAC's Jennings facility for final completion. The new PSV will return LEEVAC's Houma yard for final outfitting, commissioning and testing, with delivery in April 2014.

Damen Shipyards Galati delivered the third Platform Supply Vessel (PSV) in a series of six to World Wide Supply of Norway. This six-ship order heralds a new era in offshore construction for Damen Shipyards Group. World Pearl is built to Damen's new PSV 3300 design. The first of the Class PSV 3300, World Diamond, was delivered in July to the Norwegian company.

Delivery of the new design involved extensive CAD/CAM modeling by Damen Shipyards Gorinchem in the Netherlands and model testing at Maritime Research Institute Netherlands (MARIN). The 3300 is part of a new range of Damen PSVs. With an 80.1m length, the PSV 3300 has a deck load of 1,500 metric tons. The new type can be used to transport crew and equipment

(Photo: Ulstein)

Incorporating the X-Bow design, the inspection, maintenance and repair vessel Seven Viking was built for Subsea 7 and Eidesvik and entered service in 2013.

MV Torrens Tide launch.

(Photo courtesy of Leevac Shipyards)

to and from offshore platforms but it also offers firefighting and oil pollution recovery capability. Equipped with azimuth thrusters and dynamic positioning (DP2), the design is distinguished by slender hull lines to meet challenging conditions, minimize fuel consumption and to enhance crew comfort.

Brazil's **Oceana Offshore** will build a pair platform supply vessels (PSV) with an option for two additional vessels based on the PX105 design from Ulstein. The vessels will be built at the new yard, Oceana Shipyard in Itajai, Brazil, and are scheduled for delivery in April and May 2016, respectively. The PX105 design is a large platform supply vessel with accommodation for 23 people. The will measure 88.9 x 19 m. With a DWT of 4,700 tons they comply with Petrobras' PSV 4500 tender. These vessels have a high operational window and can take on complex assignments far from shore. They come with the X-BOW hull line design feature, in which slamming and abrupt stops from waves are eliminated. The vessels are cost-effective and fuel-saving, and the crews get more efficient rest, which also increase safety.

Island Offshore took delivery of M/V Island Duchess from the Vard Brevik yard in Norway, the second vessel in a series of four PSVs of Rolls-Royce UT 717 CD design to be delivered from Vard Brevik in 2013 and 2014. M/V Island Duchess was christened together with its sister vessel M/V Island Duke during a naming ceremony earlier this summer, and is heading for the spot market as soon as it leaves the yard.

The vessel measures 84.5 x 17 m with a deadweight of 3,800 tonnes and a deck capacity of 800 sq. m. M/V Island Duchess will be used to transport pipes and general deck load, liquid cargo as well as cement and barite to drilling rigs in the North Sea.

Oceaneering International selected BAE Sys-

Artist rendering of the subsea support vessel BAE Systems will build for Oceaneering International.

(Photo: Damen)

World Pearl.

tems to build a subsea support vessel for offshore drilling. The vessel will be used to augment Oceaneering's ability to provide subsea intervention services in the ultra-deep waters of the Gulf of Mexico. Construction will take place at the company's Mobile, Alabama shipyard, and, when complete, the U.S. flagged vessel will measure 353 x 72 ft.

The DP2 vessel will be Marin Teknikk of Norway's MT6022 design and will be equipped with a 250-ton crane capable of reaching 4,000-m water depth. It will be powered by GE tier IVi-emission compliant engines, and by energy efficient and environmentally compliant power and propulsion systems.

Jaya Holdings delivered its second new Multi-Purpose Platform Supply Vessel (MPSV), Jaya Vigilant. It sailed from Jaya's shipyard in Batam and was immediately on hire by its charterer for a term program in East Africa. The vessel will load a Remotely Operated Vessel (ROV) spread and mobilize across the Indian Ocean to load further subsea equipment for the client in Durban in October. "[Jaya Vigilant] has a 50-ton subsea crane with active heave compensation for service in water depths of up to 3,000m," said Jaya Holdings' CEO Venkatraman Sheshashayee. "We have installed two HiPAP ultra short base line transponders to give very accurate station keeping for subsea work, in addition to the

Jaya Vigilant has accommodation for 60 and is compliant with the SPS Code 2008. It has 1,000 sq. m. of clear deck space, a modern fast rescue craft, FiFi One for emergency response and full under deck cargo capacities for mud, bulk, brine and marine gas oil. Jaya has added additional power supplies on deck to support the seabed coring, ROV and hydro-graphic survey spread requirements, and the vessel has its own water maker to increase autonomy.

Jaya Vigilant

(Photo: Jaya)

Product Tanker Hijackings

Understanding Trends & Tendencies in the Gulf of Guinea

By Dirk Steffen

Gulf of Guinea piracy presents a radically different picture compared with Somali piracy. Since decades it has been a kaleidoscopic mix of short duration hijackings, militant disruptions, kidnappings, robberies and thefts, depending on the location and the setting. It was not until recently, however, that piracy in the region attracted significant international media attention due to the increase in hijackings of product tankers in the region.

It is uncertain when this phenomenon started exactly, but the hijacking of the Valle Di Cordoba on December 24, 2010 is generally held to be the first successful short duration hijacking in the Gulf of Guinea, where the hijackers had targeted the ship specifically for its cargo of gasoil.

They stole approximately 5,000 metric tonnes of the cargo and disappeared again within a span of less than 72 hours. It provided a template for at least 87 further attacks until the end of August 2013, of which 34 culminated in hijackings, although not all were successful in the theft of cargo. More than 117,000 metric tonnes of refined petroleum products – gasoil and gasoline – with a market value in excess of $100 m have been stolen from product tankers since 2010.

Myths and Risks

It is important to highlight that the tanker hijackings are for the most part closely linked to organised crime in Nigeria, which is in turn deeply embedded in that country's business and political culture. Cargoes are targeted by influential businessmen, politicians and military officers who provide buyers as well as political and security cover for the operation. Nigerian product importers (of which there are now 140 compared to just six in the late 1990s), local agents, banks and charterers provide target information. It is not a perfect system and leaves some room for opportunism. Nigerian sources suggest that about 20% of the attacks against tankers are planned by rank-and-file pirates, rather than by criminal "business consortia". All these groups have also been very adaptable over the last three years in moving their operations from where Gulf of Guinea states were attempting to increase security measures to stem attacks outside their ports.

The changeable nature of organised crime makes it difficult to predict. Nonetheless, this has not prevented a number of myths from developing in the security industry, particularly where tanker hijackings have been conflated with the wider occurrence of kidnap-for-ransom attacks against offshore targets. For a long time, for example, pundits claimed attacks were moving farther out to sea and forecast a Somali piracy situation. This appeared plausible when on October 2, 2012 a chemical tanker was attacked 136 nm from Cotonou. This obscured the underlying trend that attacks were, in fact, moving closer to shore as more opportunistic attackers with less target information entered the fray. Although attacks did take place as far as 500 nm from Nigeria, the mean average distance from the shore of all tanker attacks between 2010 and 2013 is only 22 nm, with four out of five attacks occurring closer than 40 nm from the shore in 2013. This distance can easily be covered by unsupported speedboats.

Suggestions have also been made that daytime attacks have become more frequent. Closer examination shows, however, that tanker hijackings are overwhelmingly a night-time phenomenon, except off the Niger Delta. Here, attacks follow the local pattern, which has always included an equal distribution of day and night-time attacks. An increasing number of attacks against tankers outside the Niger Delta (due to lower naval maritime situational awareness) have thus created the illusion of a change in the region-wide attacker modus operandi favouring more daytime attacks.

It has often been asserted that Nigerian piracy is more violent than in other regions, such as Somalia, and that it is becoming increasingly more violent. This is an emotionally charged topic. Hijackings are highly traumatic for many seafarers, especially in the attacks against local and oil & gas offshore shipping where casual and excessive violence remains very pronounced in Nigeria. The same level of violence is not observable in the context of the tanker hijackings. Although the number of weapons discharges outside or inside the ship has doubled since 2010 the number of casualties has remained stable and at a low level. Most crew injuries are sustained from beatings by the captors and these are not significantly at variance to the norm.

Inadequate Countermeasures

Following a surge of attacks on tankers off Cotonou in 2011, attacks against product tankers have now stabilised at about two to three per month, encompassing countries such as Ivory Coast, Togo, Benin and Gabon. West African countries' demand for imported petro-

Fig. 1: **Valle Di Cordoba is generally held to be the first victim of a successful attack against a product tanker with the intent to steal the cargo in the Gulf of Guinea in recent years.**

leum products and the impact that static ship-to-ship operations have on the security posture of vessels ensure that the business opportunities for the criminals remain extant for the foreseeable future.

The success of these attacks is also a result of inadequate preparedness by ships and ship operators. Charter parties which disregard the risks of prolonged exposure to potentially criminal business partners, lax information security, lack of vigilance and complacency have made the job easier for the hijackers. Out of 10 exemplary cases that were researched in depth by Risk Intelligence, five ships did not observe the attack until the attackers were on the bridge. Some of those vessels ostensibly had security measures equivalent to ISPS Code level 2 in place or had otherwise indicated that they had posted additional lookouts. Consequently, any other security measures, such as citadels (where ships had any), SSAS or naval response failed to have any impact on preventing the hijacking.

A typical shortcoming is the lack of region-specific guidance. While there is a half-hearted attempt to supplement BMP4 with Gulf of Guinea guidance, ISPS Code mandated measures are usually far too generic to address the threat. For example, several ships had deck patrols on a fully lit deck – as per their ship security plan requirements – with the result that the deck patrol had no visibility beyond the illuminated deck area and was in turn backlit by the deck light. The attackers ambushed the deck patrols before they were able to raise an alert.

This basic failure in understanding how security measures need to be adapted to local conditions is just one of many. Specific to the region, furthermore, is the primary focus in the Gulf of Guinea on avoidance and information security. While there are limits as to how much information that is vital for conducting business can be compartmentalised, target denial by the ship is a powerful instrument that can be deployed. Many elements can be included in the charter party without becoming commercially unviable for either side.

Conclusion

The tanker hijackings will remain a feature of Nigerian piracy for the foreseeable future. Like other forms of maritime crime in the area, it may become more cyclical as more opportunistic attacks occur, but the better-organised groups become more judicious in their targeting. Organised crime may come under pressure as regional governments, including the Nigerian government, will have to demonstrate their intent to suppress maritime crime – at least until the matter is out of the headlines of the international press. In the meantime, the use of crewmembers as human shields, as was the case aboard the French-flagged tanker ADOUR in June 2013, may provide the potential hijackers with a means to safeguard against too-robust naval intervention by local and foreign navies.

Despite cyclical changes, tanker operators still need to adapt some of their security procedures or run the risk of their vessels being hijacked. The consequences do not seem to be great at first glance – especially when compared with Somali piracy. But a number of ship owners have found themselves in court being sued by their charterers for the value of the stolen cargo on the grounds of having paid insufficient attention to the risk assessment and lack of implementation of effective security measures in the Gulf of Guinea.

About the Author

Dirk Steffen is the Director Maritime Security at Denmark-based Risk Intelligence. He has been involved in Nigerian maritime and oil & gas offshore security since 2003.

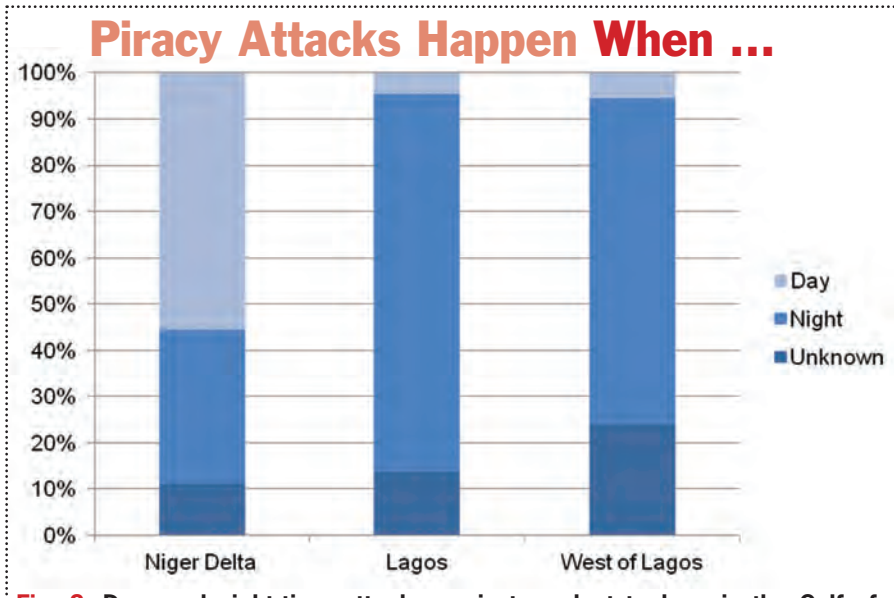


Fig. 2: Day- and night-time attacks against product tankers in the Gulf of Guinea – distribution depending on geographic location. (Source: Risk Intelligence)

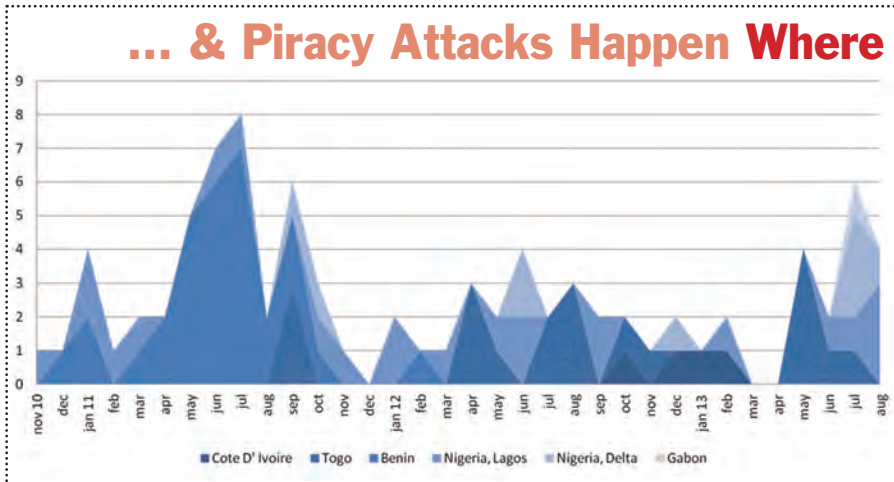


Fig. 3: Geographic distribution of attacks against product tankers in the Gulf of Guinea between November 2010 and August 2013. (Source: Risk Intelligence)

Trinidad & Tobago Maritime Sector

Shipbuilding, Repair endorsed by government to diversify economy

The recent 2013-14 National Budget of Trinidad and Tobago firmly highlighted the government's intention to endorse Shipbuilding and Repair as a means of diversifying our traditional oil and gas economy.

Trinidad & Tobago is in the middle of the world's shipping lanes with an approximate 31,000 voyages per year passing within 25 nautical miles, positioning the location as an attractive choice for vessels traversing these principal routes. In addition, approximately 14,000 ocean-going vessels pass through the Panama Canal each year and this is expected to double after mid-2015, with the completion of the ongoing $5.25 billion expansion.

Two major dry docking project proposals, are being spearheaded by local Shipbuilding & Repair stakeholders, namely Etienne Mendez of Trinidad Dry Dock Company Limited (TDDCL) at Sea Lots and Chivon Thornhill of New World Shipyards Limited, at La Brea. In addition to the core dry docking facilities, it is the intention that TDDCL will maximize the potential of their Sea Lots project by embarking on the development of a number of on-site, downstream projects including a Marine and Industrial Park, and Residential and Commercial Centers, resulting in facilities that cater to their own internal requirements.

As mentioned in the recent National Budget, the Government of the Republic of Trinidad and Tobago (GoRTT) has engaged China Harbor Engineering Company Limited (CHEC) which is a world-renowned international contractor that is a subsidiary of China Communications Construction Company Limited (CCCC) for a feasibility study, revolving around the establishment of a new trans-shipment port with dry docking facilities to be included and also located in La Brea, south western Trinidad. This is to be financed by a small part of a Three billion United States dollar developmental aid package on offer (since 2011) by the Government of the People's Republic of China to the Caribbean island region and is available on the basis of first come, first served. The dry docking facilities proposed by New World Shipyards Limited is a separate project to be financed mainly by private sector equity investors, but will be considered holistically, as part of the overall port development planning process.

Simultaneously, the extension of the highway to Point Fortin, through La Brea will definitely hasten and encourage the development of the south western peninsula, as a designated growth pole area. This is in keeping with an SRDC proposal to the current administration for interim use of a part of the newly built, 300 meter long former ALUTRINT Smelter dock and underutilized warehousing, located at Brighton Port, La Brea immediately adjacent to where offshore oil and gas steel platforms are currently being fabricated. This location is situated away from Chaguaramas which is located in the North-western part of Trinidad, and has long been seriously constrained by one road access and egress already exceeding its maximum vehicle carrying capacity. The lack of available lands for new tenancy in the development of additional deepwater shore side operations is also a disadvantage.

On the August 29, 2013 a consultation on the Draft Strategic Plan for the Maritime Industry for the period 2013-2018 was held at The Courtyard Marriot, Invaders Bay, port of Port of Spain. This timely review of the existing Strategic Plan was completed by KPMG, a global advisory with offices in Trinidad and Tobago and hosted by the Ministry of Trade, Industry and Investment and the Maritime Industry Development Committee, now chaired by Mr. Ernest Ashley Taylor, President of the Point Lisas Industrial Port Development Corporation Limited.

Among the suggestions made at this consultation by the SRDC, is that urgent and serious dialogue be jointly undertaken with the Ministry of Energy and Energy Affairs, The Ministry of Finance and the Economy and the Ministry of Trade, Industry and Investments, with regard to the provision of competitive marine bunkering fuel cost (available to both local and international ships) which can be used as an incentive for more ships to not only utilize our bunkering services, but other supporting maritime services, including ship repairs, logistics, ship stores, etc. This will create a demand curve for these and other related services, thereby encouraging the rapid growth of our domestic maritime sector, which is highly labor intensive.

Trinidad and Tobago can quickly become an international magnet for competitive maritime services, in much the same way as both the Republic of Singapore and the Republic of Panama have achieved, by using their strategic geographic and competitive advantage to benefit their economies. The completion of the new Ultra Low Sulfer Diesel (ULSD) Unit being finalized by Samsung Engineering, as part of Petrotrin's Clean Fuels Program in its continuing effort to improve the profitability of the Pointe-a-Pierre Gulf of Paria refinery will support this move, while meeting the stringent new diesel quality specifications required for the global shipping market.

Already, one global ship owner, Oldendorff Carriers GmbH & Co. KG with its headquarters located in Lübeck, Germany has established an offshore iron ore

trans-shipment facility, since July 2012 to take advantage of our strategic geographic location between South America and their distant bulk commodity markets. The direct result is that Oldendorff Carriers Trinidad and Tobago Limited, an affiliate of Oldendorff Carriers GmbH & Co. KG has already become one of Petrotrin's largest customers due to their six million tons per annum of iron ore operations being located nearby.

Oldendorff Carriers trans-shipment operations, located some six nautical miles off the westerly coast of Trinidad, in the Gulf of Paria, has also provided high paying continuous employment for some 100 nationals of Trinidad and Tobago and presently entails the movement of iron ore which is loaded onto Handymax vessels in the port of Santana in the Amazon River, Brazil, where the maximum draft of 11.50 meters on the river, limits the carrying capacity to approximately 45,000 tons of ore, per vessel. Upon completion of all trans-shipment cargo operations, fully laden Capesize vessels (180,000-200,000 metric tons) sail after only 6-8 days from their Gulf of Paria Free Zone area to arrive at their final destinations in offloading terminals located in the People's Republic of China or the Arabian Gulf.

As was recently done by the Ministry of Trade, Industry and Investments, GoRTT for the Foreign Used Car industry, restrictions should also be removed for entry and expansion of industry players in the domestic maritime sector. Restrictive policies can negatively impact growth and expansion of the global maritime industry and can be seen in our local ship bunkering industry. For example, a case can be seen with Aegean Marine Petroleum Network Inc. (NYSE: ANW) which is an international marine fuel logistics company that markets and physically supplies refined marine fuel and lubricants to ships in port and at sea. Currently, Aegean has a global presence in 20 markets, including Trinidad and Tobago, Vancouver, Montreal, Mexico, Jamaica, West Africa, Gibraltar, the United Kingdom, Northern Europe, Piraeus, Patras, the United Arab Emirates, Singapore, Morocco, the Antwerp-Rotterdam-Amsterdam (ARA) region, Las Palmas, Tenerife, Cape Verde, Panama and Hong Kong.

Since the establishment of Aegean Bunkering Trinidad operations, offshore the North and East coasts since 2009, it has been actively seeking with very limited success to expand its permitted coverage area to also include the calm waters of the Gulf of Paria, which offers the benefits of one of the largest sheltered harbors in the world and is a drawing card for some of the 31,000 ship voyages per year, passing within 25 nautical miles. Some of these ocean going ships, collect their varied bulk commodity shipments of Cement, Methanol, Liquefied natural gas (LNG) , Urea and Steel rods from the several industrial ports scattered along the western coastline.

Compared to the Republic of Singapore, an island economy seven times geographically smaller in size than Trinidad and Tobago, the situation is different. In Singapore there are a total of 68 accredited bunker suppliers, 67 of which can supply all grades of marine fuel and 1 which is licensed to supply Marine Gas Oil (MGO) only.

With their huge global ship owner account base, Aegean Marine Petroleum Network Inc., is eagerly looking to expand their Trinidad and Tobago bunkering operations, pending a review and grant of an expansion to their existing Bunkering License, by the Ministry of Energy and Energy Affairs, GoRTT. This current situation can be compared with our Trinidad and Tobago National Petroleum Marketing Company Limited (NP) having a near monopoly for several decades for the exclusive supply of land based retail petroleum fuels and lubricants for the automotive sector. With the establishment of the United Independent Petroleum Marketing Company Limited (UNIPET) and the subsequent explosive expansion of their operations, including the supply of Compressed Natural Gas (CNG) fuels, I have yet to hear of one complaint…

The above update clearly demonstrates the determination of both the government and private sectors, in shaping our future economy away from the traditional oil and gas sectors. There is still room for growth in the maritime industry.

About the Author

Wilfred de Gannes – Chairman & CEO, Shipbuilding & Repair Development Company of Trinidad and Tobago Limited (SRDC) which is the commercial business entity of the T&T Shipbuilding & Repair Maritime Cluster. He is also the Editor of the Trinidad and Tobago Shipbuilder & Repair News (http://issuu.com/shipbuildingandrepair).

Seatorque Boost for Brazil's Biggest Superyacht

Brazilian superyacht builder MCP Yachts credited Seatorque Control Systems for contributing to the outstanding performance of its latest launch – the Hemisphere 140 Raffaella II. Incorporating Seatorque's enclosed drive shaft system, the 43m aluminum vessel, powered by twin Caterpillar C32 1825 HP engines, achieved a top cruising speed of 22 knots during sea trials with an 85% load and 167 metric tons displacement, said MCP president Manoel Chaves. The vessel features a pair M3-400 single-piece Seatorque shaft systems, each 22 ft. long, accommodating the vessel's four-inch diameter shafts.

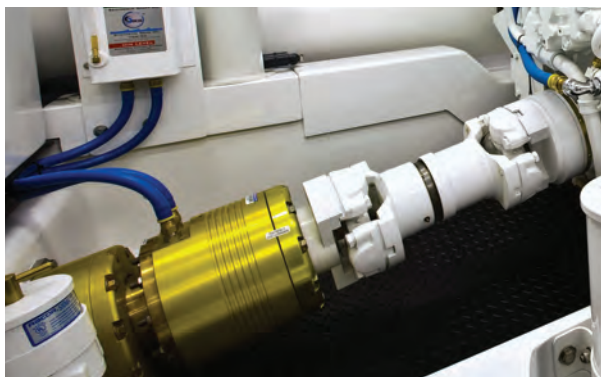
"The vessel's light weight, propeller design and shaft system all add together to make a huge difference," said Chavez. "In all my years on the water, I have never witnessed a vessel this size with a comparable power package to cruise at this speed. Thanks to Seatorque's enclosed shaft system, the vessel achieved maximum horsepower, experienced zero shaft noise and vibration, and produced very little wake."

Launched in July, Raffaella II is the largest yacht built in Brazil to date and reportedly the largest aluminum yacht ever built in South America. The vessel was designed by MCP in collaboration with Vripack and built at the MCP shipyard in Guarujá . It is the third vessel built by MCP Yachts to include the Seatorque Enclosed Shaft System.

According to Seatorque executive vice president Jana Stolper, the Seatorque Enclosed Shaft System is growing in popularity among superyacht builders, as evidenced by the 2012 installation on the highly-acclaimed McConaghy Yachts Adastra, designed by John Shuttleworth. This futuristic 140-foot trimaran, powered by a single Caterpillar 1,000 HP C18 engine, features an Seatorque ST-300, 32-foot, one-piece enclosed shaft system.

The Seatorque Enclosed Shaft System is a self-contained, oil filled, shaft and thrust bearing assembly designed for yachts of all sizes. The system is supplied as a single unit from the propeller end to the engine input coupling accommodating any length shaft and diameters up to seven inches. Operating as a self-contained unit, the Seatorque system allows propeller thrust to be fielded by internal bearings and delivered through the shaft's mounting system supported by the structure of the vessel, rather than the vessel's engines and isolators. This reduces vibration and noise and increase the life expectancy of the engines and transmission mounts. The Seatorque system connects the shaft to the engine using flexible universal joint assemblies. This eliminates leaking stuffing boxes, seals, cutlass bearings and associated shaft wear. The use of universal joint assemblies also eliminates damaging engine-to-shaft misalignment and reduces installation and alignment time by more than half. The elimination of cutlass bearings and stuffing boxes results in an average eight percent increase in horsepower, allowing for greater fuel economy and range. In addition, water flow is undisturbed by the non-rotating casing of the shaft assembly, allowing clean water flow to the propeller. This translates into an increase of thrust arc around the propeller, contributing to the efficiency of horsepower delivery. "The Seatorque system replaces the traditional multiple-component shaft system with a single piece of equipment that is simple to install and improves the performance and efficiency of any vessel, while greatly reducing shaft noise and vibration," said Stolper. "These are very important benefits for yacht owners, especially those accustomed to long-range travel."

www.seatorque.com



The MCP Hemisphere 140 Raffaella II is the largest yacht built in Brazil to date and the largest aluminum yacht ever constructed in South America. Powered by twin Caterpillar C32 1825 HP engines, Raffaella II achieved a top cruising speed of 22 knots during sea trials producing a minimal wake. The Seatorque Enclosed Shaft System is a self-contained, oil-filled shaft and thrust bearing assembly designed to increase horsepower, fuel economy and engine life while minimizing shaft noise and vibration. The system is supplied as a single unit from the propeller end to the engine input coupling accommodating any length shaft and diameters up to seven inches.

World-First A Purely Gas-Powered Tug

Rolls-Royce reports on Sanmar Shipyard's completion of what it is calling the world's first gas powered tug. The ceremony was held in Istanbul, Turkey, recently. Sanmar completed the first of two tugs for Norway's Buksér og Berging, which each feature two Rolls-Royce Bergen C26:33L6PG engines fueled purely by liquefied natural gas (LNG).

The first boat, named Borgøy, will enter service next month following a series of sea trials. It will be operated by Norwegian state oil company Statoil at its Kårstø gas terminal.

The Rolls-Royce propulsion package includes the gas tank and supply system and two of the latest design US35 azimuth thrusters that ensure the tugs have rapid maneuvering and positioning capabilities – essential for tug operation.

Neil Gilliver, Rolls-Royce, President – Merchant, said, "The completion of this vessel is highly significant for Rolls-Royce, Sanmar Shipyard and Buksér og Berging. We are extremely proud to have worked together on this successful project which heralds a new era for tug boat propulsion.

"Gas is gaining in popularity as a maritime fuel, and its environmental credentials, combined with lower costs ,are seeing many operators select it over traditional fuels across a range of ship types.

"Most of the world's tug fleets operate close to shore, where emissions regulations are most stringent. As LNG becomes more widely available, I have no doubt that many major ports will soon opt for this clean, lower cost and smoke-free fuel to power their tugs."

The combination of Rolls-Royce gas engines and the latest thruster design, mean that the Borgøy and its sister vessel's CO2 emissions, will be around 30% lower than conventionally-fuelled tugs. They will also comply with all known future emission regulations.

Neil Gilliver, Rolls-Royce, President, Merchant (front left) congratulates Ali Gurun, Sanmar Shipyard, Project Director.

MR DIGITAL

When you leave the page and head to the screen, Maritime Reporter offers the most digital and online news offerings. Here are select stories from last month on MaritimeProfessional.com

Panama Expansion Gets Latin America Moving

The widening of the Panama Canal has put a rocket up the infrastructure plans of ports across the Americas. The expected launch of Panama 2.0 is "sometime in 2015" and ports across the U.S. East Coast - at least the ones that have received funding - are busy digging away to make the channels and berths deep enough for the big ships.

But it is not only U.S. ports that are getting ready. In the Caribbean and South America, ports that have never featured high on any "potential hub" list are building and expanding their own facilities in a bid to capture the increasing business.

Baranquilla and Cartagena in Colombia, Suape and Santos in Brazil, ports on Mexico's Gulf coast and the Caribbean - all are working on improving seaside and inland port access. Emerging markets trade has dropped off this year after several years of impressive growth. It is giving the ports across Latin America, and Africa too, for that matter, some breathing space to sort out the considerable infrastructural shortcomings ports across the developing world share.

A serious amount of work needs to be done in all these ports, especially those that handle direct exports and imports. Transhipment is easier to cope with - you build a bunch of deep berths and a big yard and focus on improving productivity and lobby the shipping lines like hell to include you on their schedules. But the ports that are handling direct containers inbound or for export need massive improvements to their road and rail networks. In some cases the terminals need to be relocated outside busy city limits.

The problem is that everyone wants to be a hub, and that is not possible. Fortunately, it is not a zero sum game. Ports that do manage to become hubs and can handle the huge container volumes that accompany that status will need a robust feeder network to keep their terminals busy.

This is where the smaller ports come in. The infrastructure investments are needed regardless of whether they become the busiest ports in the region or act as a feeders for the hubs. What they will have to overcome, however, is an approach described by a speaker at the Air and Seacargo Americas conference here in Miami recently as “let them come and we will build it.”

Make no mistake, it is a race with very lucrative benefits. The ports that can quickly develop the ability to handle large volumes of containers efficiently will pick up momentum that will be hard to stop.

Still, pouring concrete is the easy part. The real work will lie in convincing governments to adjust protectionist regulations and remove barriers to trade.

Posted by Greg Knowler, Hong Kong, on MaritimeProfessional.com

Nerves Abound in the U.S. Over the P3 Alliance

Perhaps Maersk is taking revenge on Virginia. Although details are still coming through and being thrashed out, it seems that Virginia is possibly getting less attention from the P3 Alliance than it would like.

In terms of direct port pair calls, Norfolk is getting 10 a week, compared with 15 for Savannah and 14 for New York. Los Angeles/Long Beach are showing their muscle with 23 calls (according to MSC, whose figures are slightly different to those of its two partners.) Analysts were expecting a snub of some sort to Virginia after it rejected Maersk’s offer to operate all the Virginia Port Authority’s terminals, and the thinking is that Maersk already had a vague plan for an alliance when the offer was made. In fact, it’s not too far-fetched to speculate that some sort of hub was being planned in that region, but this idea has now been squelched. (Notwithstanding the fact that ex-Maersk exec is the new Executive Director at the VPA.)

But even LA/Long Beach are nervous about the new arrangement. Long Beach harbor president Thomas Fields told a meeting, sponsored by the Pacific Merchant Shipping Association, of discussions with the shipping lines, “They told us in no uncertain terms that they would be drastically cutting down on the number of ports and terminals where they send their ships. They have choices like never before.”

As Fields also points out, the Big Box retailers only send about 20% of their cargo through Long Beach/LA, down from more than 60% 10 years ago.

And even the Federal Maritime Commission is nervous. Chairman Mario Cordero wants a meeting with opposite numbers from Europe and China on the effects of the alliance. “One of my concerns relates to media reports that a combined east-west fleet of 346 vessels will be reduced to 255 vessels once the proposed Alliance is consummated,” said commissioner William Doyle.

Ports need to concentrate on their infrastructure as much as on issues like the volume of business. PortMiami director Bill Johnson told the TOC Americas recently, “The U.S. has historically been a leader in building smart infrastructure, but for decades now we have lagged. Not only am I talking about port infrastructure but you have to connect that infrastructure through a smart and intelligent road system, by rail, and through intermodal centers. There is an ongoing need for strategic investment in ports. I see the investment in China and in other parts of the world and they have outpaced the United States significantly for decades,”

The link between more business and better facilities is ironclad.

Posted by Martin Rushmere, W. Coast U.S., on MaritimeProfessional.com

FLUYT

The merchant vessel responsible for 17th century Dutch trade dominance

The fluyt or fluitschip was one of the first ocean-going ships built exclusively for commerce. Previously, ships tended to be built to perform the dual role of fighting battles and carrying cargo. Thus, their construction was fairly robust and they carried cannons, ammunition and combat personnel. The Dutch did away with that. The fluyt was lightly constructed. It carried only sufficient armament to fend off pirates and the entire crew was working sailors. To maximize cargo capacity while minimizing crew size, the main deck was relatively small, but the hull bulged out on the sides, creating a “fat-bottomed” or pear-shaped cross-section. This design also had the advantage of reducing ship tolls, particularly through the Øresund, where the Danish toll was based on the dimensions of the main deck. The fluyt carried three stubby masts, with the fore and main square-rigged and the mizzen lateen-rigged. While not speedy, these vessels were inexpensive, both to build and to operate. Typically about 80 feet in length, they operated with a crew of about 35 men. They could carry twice the cargo of their counterparts at half the cost. First built in 1595, they soon allowed the Dutch to dominate international maritime trade, first to the Baltic and then to India and the Far East.

The fluyt was the favored vessel of the Dutch East India Company, which dominated the Far East trade for almost a century. It took the British a surprisingly long time to adopt and modify the design, which they referred to as an East Indiaman vessel.

Posted by Dennis Bryant on MaritimeProfessional.com

THE PROPULSION EVOLUTION

Naval architect focus on enhancing ship propulsion efficiency

As the shipping industry faces rapid and comprehensive changes in various sectors, naval architects find themselves facing the brunt of the heavy demands not just from the regulatory change being brought into place but also the increasing pressures to shore up engine efficiency, reduce pollution and, above all, the growing need to have ship designs which owners find cheaper and easier to operate.

Taking the bull by the horns, the Institution of Naval Architects of India (INA) has created a forum under the banner 'INAVATION Technical Meet' to help members and other interests keep abreast of various developments and new technologies being developed. The recent INAVATION Technical Meet held recently - a quarterly event - brought into focus a fundamental issue that has gained significant importance, "Propulsion and Maneuvering - Vendors and Manufactures Forum".

Featuring the "Developments on Wartsila 2S Generation X Engines and 2S low pressure DF engines" Sarad Sinha of Wartsila India explained that the company is committed to continuously improving efficiency because it means profitability for the customer and protection of the environment. "Fuel flexibility is an important matter as the customer has the option to decide on the type of fuels he can switch to," he said. "Wärtsilä is passionate about optimizing lifecycle value by offering whatever its customers in the marine industry need from the most complete offering of marine products, integrated solutions and services."

A synopsis of the marine engine design evolution over the last few decades focusing on the utility of higher stroke / bore ratio and increased propeller diameter formed the basis of the development. To the query "What is the market asking from us?" he explained, "Ships have specific design and engines have to adapt to the design. Normally engine price is 10% the cost of the ship and we are constantly looking to reduce this. The key requirements of the owners are reliability, total cost of ownership and serviceability, best ship performance and attractive overall cost. Earlier container ships had to operate at high speeds but now this has changed."

Wärtsilä's portfolio includes a range of products, solutions and services aimed at both land-based power plants and ship installations. As part of the portfolio, Wärtsilä offers catalysts (SCR) that reduce nitrogen oxide (NOx) emissions and scrubbers for removing sulfur oxides (SOx). They also offer complete oily water treatment systems for power plants and marine applications that meet the most stringent standards, as well as ballast water treatment (BWT) systems which are vital to prevent organisms from one ecosystem upsetting the ecological balance in another. Their range of offering cover total service packages, including start-ups, installations, engineering work and maintenance and repairs.

Speaking on another aspect of the evolution that has taken place Jussi Kuusisto of Rolls Royce Marine India featured "Developments in Azimuth Propulsion Technology". According to him there were several benefits of Azimuth Thrusters to convention propulsion. "They have superior maneuverability, provide direct trust and turning on the spot, improved crash stop, improved dynamic positioning capabilities; real redundancy in propulsion and steering." He said that flexibility in design provides freedom in location and shafting, reduced building costs with compact package, simple hull form and short engine room. They can be installed late in the building process and service without dry-docking (if delivered as bolted-inversion).

Why use natural gas as a marine fuel? Kuusisto points out, "It is a simple, clean and efficient system. Single fuel – optimize; smoke free exhaust, inherently safe engine. Basically LNG is the tug fuel of the future."

In his Keynote address by Prof R. P. Gokarn, world renowned authority on naval architecture and propeller design spoke on his favorite subject about improving propeller efficiency in ships. As ships have become larger, faster and more powerful, and drafts of water levels have remained constant he presented various option available to designers in enhancing propeller efficiency. This include reducing energy loses, having higher diameter propeller and reducing the rpm (revolutions per minute), etc. He touched upon various theories and rules associated as well as operating conditions that affect efficiency.

Posted by Joseph Fonseca, Mumbai, on
MaritimeProfessional.com

OBITUARIES

Marc La Monte
CEO of Heidmar

Heidmar reported the passing of Marc La Monte of Wilton, Conn. La Monte passed away while on a business flight in Europe on the morning of October 14, 2013. La Monte was a respected member of the international shipping industry for 27 years, and he served as President and CEO of Heidmar Inc. since April 2012. Prior to becoming CEO, Marc had been the Managing Director of Heidmar's VLCC tanker pool, Seawolf Tankers. Before joining Heidmar, Marc spent 16 years at Overseas Shipping Group. Marc is survived by his wife, and three children.

Daniel B. Branch: Past President, Navy League

The Navy League of the United States announced the death of its past national president, Capt. Daniel B. Branch Jr., USN retired. He died on Oct. 21, 2013, of complications from mesothelioma cancer at the age of 75. Dan was born in Greenbelt, Md., in 1937, and graduated in 1959 from the U.S. Naval Academy. Dan achieved the rank of captain during his 30 years of service in the U.S. Navy.

Jesse M. Calhoon
Maritime Industry Labor Leader

The Marine Engineers' Beneficial Association (M.E.B.A.) said that Jesse M. Calhoon, the M.E.B.A.'s longest serving President died on October 22, 2013 at the age of 90. His service as M.E.B.A.'s top executive and Chairman of the Board of Trustees spanned over 20 years and six U.S. Presidencies. Calhoon was born in Belhaven, North Carolina, on April 4, 1923 into a farming family that supplemented their income by fishing. He first went to sea as a coal passer in Norfolk, Vz. in 1939 at the age of 16. He joined up with the National Maritime Union and shipped out as a fireman and then oiler before sailing in convoys in support of the allied effort in World War II.

Jesse M. Calhoon (left) with Richard Nixon

Reinhard

Fox

Taylor

Michel

Reinhart: Maersk Line President, CEO to Retire

John F. Reinhart announced his retirement as President and CEO of Maersk Line, Limited (MLL). He will continue to lead the company until his departure at the end of January 2014. "I have been blessed to be part of the A.P. Moller - Maersk Group for almost 23 years, and it has been my privilege and honor to work together with you for the past 14 years," Reinhart wrote to MLL colleagues.

Chouest Appoints Fox to Lead Alaska Ops

The Edison Chouest Offshore group of companies (ECO) announced the appointment of Rick Fox as senior vice president and general manager of Alaska operations. Fox will be responsible for leading all ECO vessel activities in the Arctic, as well as overseeing the operation of Chouest affiliates Fairweather, LLC, Deadhorse Aviation Center, Tulugaq, LLC and VDOS, LLC (Virtual Data Operations Support).

Topaz Marine Engineering appoints Taylor MD

Topaz Marine Engineering appointed Geoff Taylor as its new Managing Director. Taylor joins the company following a period as an independent marine consultant. Prior to this he enjoyed a career spanning 27 years with Dubai Drydocks and Drydocks World.

Michel Takes the Helm at Webb

R. Keith Michel (Webb '73) was inaugurated as the 15th president of Webb Institute on October 24, 2013. Michel assumed office on July 1, 2013, following the retirement of RADM Robert C. Olsen, Jr. USCG (Ret.), who filled the role for eight years. Chairman of the Board of Trustees, Dr. George Campbell Jr., conducted the presidential inauguration. Speakers included the city of Glen Cove Mayor, Ralph Suozzi, Honorary Trustee Charles Kurz II, current Senior Henry Jansen, Webb Alumni Association President Matthew Tedesco (Webb '91) and Dean Richard P. Neilson (Webb '70).

Ermakov Appointed Transas CEO

Transas Group announced Valery Ermakov took over the responsibilities of Chief Executive Officer, Transas Group as of October 22, 2013. Prior to joining Transas Group, Valery Ermakov served as First Deputy CEO – COO at the Russian telecom giant - OJSC MegaFon.

Anagnostis Takes WISTA USA Helm

At the global Women's International Shipping & Trading Association (WISTA) annual meeting and conference held in Montreal, Jeanne Grasso, a partner at Blank Rome LLP, was elected to the Executive Committee of WISTA International. Grasso has been the President of WISTA USA for the past five years, during which time its membership has increased by nearly 30% to become the largest in the global Association. Grasso relinquishes the Presidency of WISTA USA to Alexandra Anagnostis, President and Owner of Total Marine Solutions. Anagnostis sees an opportunity to "push the profile" of WISTA USA as it continues to promote women in maritime. "WISTA has proven to be one of the most effective networking organizations in the maritime industry for female executives," said Anagnostis.

Westlawn Adds Dean of Naval Architecture

Westlawn Institute of Technology, the not-for-profit educational affiliate of the American Boat & Yacht Council (ABYC), welcomed RADM Gordon G. Piché USCG (Ret.) as Dean of Naval Architecture. Piché was also elected to Westlawn's Board of Directors. Piché is a graduate of the U.S. Coast Guard Academy, with a BSE in general engineering. He holds an MSE in naval architecture and marine engineering and an MSE in engineering mechanics from the University of Michigan.

Maersk Tankers, Damco Appoint New CEOs

Morten Engelstoft has been appointed CEO of Services & Other Shipping in Maersk, effective January 1, 2014. In addition Morten Engelstoft will take over the position as CEO for Maersk Tankers, as Hanne B. Sørensen has been appointed CEO of Damco. The changes in Maersk Tankers and Damco will also be effective from January 1, 2014.

Trailer Bridge Appoints Miskowiec, Wegrzyn

Trailer Bridge, Inc. announced the appointment of Dave Miskowiec to the role of Executive Vice President, Commercial. In his new role he will be responsible for all commercial activity focusing on automotive, NVOCC and charter barge - heavy lift sectors within Trailer Bridge. Miskowiec began his career at Trailer Bridge in May of 1997 and has since served in numerous executive capacities, most recently as Vice President of Sales.

Also, Jacob Wegrzyn has been named Vice President of Sales, responsible for all sales activity in the United States, Puerto Rico and the Dominican Republic.

Anagnostis

Grasso

Martinez

Heidmar Appoints Ognibene Interim CEO

Heidmar's Board of Directors appointed Ben Ognibene to the position of interim CEO, in the wake of the death of CEO Marc La Monte. Ognibene became Heidmar's COO in July 2013. That promotion followed a career at almost every level of the company's Pool management business, during which time he worked closely with both Pool partners and more recently chartering clients. Ognibene started at Heidmar in 2004 focusing on the creation of Heidmar's Aframax Pool, Sigma Tankers.

SENER Hires Martinez

Héctor Martínez has been appointed Commercial Director of SENER's Marine Strategic Business Unit in Mexico in addition to his responsibility as Commercial Director of the Aerospace Strategic Business Unit in the same division. Born in Mexico, Martínez is an Electromechanical Engineer, graduated from the Pan-American University specializing in Industrial Engineering and holds a master's degree in Business Administration from the IPADE Institute. In his new position, Martínez will seek business opportunities in Marine Engineering and will engage in licensing of the FORAN system, one of the most marketed CAD/CAM software programs used for the construction of ships and offshore devices, as well as in space, aeronautics and defense.

DMW Marine Group Hires Redder

DMW Marine Group hired Monty Reeder as its Inside Sales Manager and New England, Canada and mid-Atlantic direct Sales Representative. Reeder graduated from Ursinus College and previously represented Iron Mountain. Mark Gregory will now be responsible for direct sales in the Southeastern U.S. and Gulf Coast while Bo Weidner will continue to handle the West Coast of the U.S. and Canada. Doug Weidner will maintain his position as Sales and Operations Manager for DMW Marine Group.

Billings Tapped to Top OMSA

The Offshore Marine Service Association announced that it will begin a transition of leadership. Several months ago, President and CEO Jim Adams informed the OMSA Board of Directors that he would be stepping down by the end of the year to manage a startup business that he and his partners have developed in his hometown of Louisville, Kentucky. Ben Billings has been selected to assume the role of President and Chief Executive Officer, joining OMSA on November 1, 2013 for a month of transition work and begin his role as President and CEO on December 2, 2013.

Riva to Serve as Chief Surveyor of ABS

Joseph "Joe" Riva was appointed to the position of ABS Vice President and Chief Surveyor. This role is responsible for guiding and overseeing all ABS survey activities, applying a strong knowledge of ABS Rules and Guides and international regulations to create consistency and quality in service delivery. Riva will succeed Linwood "Lenny" Pendexter, who has held the position for ten years.

Keppel to Operate Mexican Yard with PEMEX

Keppel Offshore & Marine (Keppel O&M) signed an MOU with PEMEX Exploracion y Produccion (PEP) and P.M.I. Norteamérica, S.A. de C.V. (PMI), both subsidiaries of Mexico's national oil company, Petroleos Mexicanos (PEMEX). The MOU is to jointly develop, own and operate a yard facility in Mexico, the first phase of which is to support the construction of six KFELS B class jackup drilling rigs for PEP.

Vigor Renames Fabrication and Alaska Operations

Vigor Industrial renamed two of the company's subsidiaries. U.S. Fab, Vigor's fabrication and shipbuilding subsidiary, is now Vigor Fab. Alaska Ship and Drydock, which operates the Ketchikan shipyard in Alaska, is now Vigor Alaska. Vigor Fab and Vigor Alaska join three other subsidiaries under the Vigor name:

- Vigor Shipyards, which provides repair, maintenance and modernization services to the U.S. Navy and Coast Guard
- Vigor Marine, which provides fixed-price ship repair, refit and modernization services to commercial customers
- Vigor Machine, which provides machining work for a variety of industrial applications, including turbines and generators

Stena Polaris Completes Northeast Passage Voyage

After 35 days at sea, the Stena Polaris has arrived at the port of Yousu in South Korea. It sailed via the icy and harsh Northeast Passage along Russia's northern coast. Stena Polaris began its voyage on September 17 in the port of Ust Luga in the Gulf of Finland with a cargo of 44,000 tons of naphtha. The voyage is a joint project between Stena Bulk and South Korean Hyundai Glovis, the shipping arm of the Hyundai Group. The ship is built to ice class 1 A specifications in accordance with DNV, which means that it is well equipped to sail in ice-covered waters where broken ice can be up to 0.8 m thick. The P-MAX tankers were designed and built by Stena and Concordia Maritime.


Holcomb


Billings


James


Mund


Rafferty


Arnold

Holcomb Joins EBDG

Richard Holcomb has joined the Elliott Bay Design Group (EBDG) as a senior naval architect. Holcomb is a registered professional engineer (PE) and the latest hire at the growing firm, which has been acquiring new talent in response to increased customer demand for its services across the country.

Vestdavit Appoints James U.K. Director of Ops

Norway-based boat handling system and specialized davit supplier Vestdavit has appointed Andy James as Director of Operations for the U.K. Andy James served 25 years in the Royal Navy as an engineer, including working ashore as a workshop manager in a shipyard and as a project manager for new equipment. At the VT Group (later BAE) he helped implement and provide a fully commercial model of support to a fleet of six RN warships.

Mund Named Technical Director

Licensed Professional Engineer and Naval Architect Andrew Mund has been named AdvanTec Marine's Technical Director, leading marine engineering and design initiatives for all five of the companies that make up the AdvanTec Marine family: Diamond Sea Glaze, Freeman Marine, Manly Marine, Pacific Coast Marine and Steelhead Marine.

Ingram Barge Announces Promotions

Craig E. Philip, CEO, Ingram Barge Company, announced several changes and promotions for the Marine Group.

Dave O'Loughlin has been promoted to Senior Vice President, Vessel Operations and Strategic Sourcing, reporting to Kaj Shah, President, Ingram Barge Company. Mr. O'Loughlin will head up vessel operations and oversee a strategic sourcing team comprised of the external services and purchasing departments.

Brian Rafferty has been named Vice President, Customer Service, reporting to Mr. Shah, responsible for Ingram's dry cargo customer service and logistics planning functions.

Leigh Ann Baird has been named Vice President, Liquid Sales and Customer Service reporting to Dan Martin, Senior Vice President and Chief Commercial Officer. She will be responsible for Ingram's liquid barge fleet sales and customer service.

Chuck Arnold has been promoted to Vice President, Business and Strategic Development, reporting to Mr. Philip. He will be responsible for business development and oversee a portion of the planning and analysis group.

Dan Mecklenborg, Senior Vice President, Chief Legal Officer and Secretary, has assumed responsibility for Custom Fuel Services in addition to retaining responsibility for Ingram's legal, claims, safety and governmental affairs functions.

David Sehrt, Senior Vice President and Chief Operations Officer for Ingram Barge Company, will assume responsibility for the Barge Maintenance and Facilities teams, as well as continue his responsibility for Ingram's Vessel Engineering function.

Willard Marine Appoints Hunter

Willard Marine appointed Taylor Hunter as director of sales. Hunter, an experienced senior-level sales executive, will assume overall responsibility for the company's sales in the U.S. and internationally. He will be based in Willard Marine's corporate offices in Anaheim, Calif.

Intellian Appoints Snooke

Intellian appointed Charlie Snooke as global director sales engineering. He has more than 20 years' experience in the marine electronics business, having provided installation and technical support for a wide range of navigation and communication equipment suppliers.

Shearer Group Continues Expansion

The Shearer Group, Inc. (TSGI) announced the continued expansion of its naval architecture and marine engineer practice near Houston. Over the past year the company has made five new additions: Joshua Sebastian, P.E., Engineer Manager; Michael Capitain, Naval Architect; Ronald P. Sikora, Designer; Jacqueline Ellis, Designer; and Jo Ann Pitzer, Administrative Assistant.

New Drydocking Solution from WSS

Wilhelmsen Ships Service (WSS) launched a new service for the ship repair market, an offer aimed to streamline drydocking operations by allowing customers to take advantage of integrated ships agency, safety and equipment services from a single source. Paul Rogers, WSS Commercial Director for Northeast Asia, said the service was developed to create added value in the drydocking process. "Drydocking is a critical component of a vessel's lifecycle, but is one that is also expensive, complex, highly technical and prone to unforeseen complications," said Rogers. "Planning for drydocking can take months and the process itself needs close day to day management." As well as providing dedicated ships agency during the drydock, WSS can coordinate supply of marine chemicals and safety services, handling of crew and personnel and management of any specialist services that may be beyond the yard's capability.

Laborde Picked as Vapor Power Distributor

Laborde Products was selected as Vapor Power International Marine Distributor for the North American marine markets. "The Vapor Power heaters really complement our growing position in the inland tank barge industry and gives us another arrow in our quiver when providing a turnkey package to our heated barge customers," said Doug Oehrlein, Laborde Products' VP sales & marketing. "The Mitsubishi powered mechanical tank barge power units and the Vapor Power heaters are the right product for our heater barge customers," said Oehrlein. The new relationship also positions Laborde to provide the Vapor Power heater product support through the company's three branch offices and 17 marine dealers.

Laborde Opens New Texas Division

Building on its mission statement, "The Right Product, The Right Service, The Right Support," Laborde Products, Inc., headquartered in Covington, La., is opening a new division, Laborde Equipment Services (LES) in San Antonio, Texas. This new facility will provide service to the rapidly expanding San Antonio metro area and the exploding oil and gas Eagle Ford Shale market. LES will provide fast, on-time service for all makes of diesel and gas engines and engine driven equipment, as well as hydraulic and electrical service. They will also stock and provide parts for a broad range of support. Laborde Products, Inc. has been providing manufactured prod-


Mecklenborg


O'Loughlin


Sehrt


Baird


Hunter


Snooke

ucts including diesel-powered generators, pump packages, pressure washers and other equipment over the past 15 years under its Diesel America trademark. It is a distributor for most of the Gulf Coast and up the Mississippi River basin for Mitsubishi, Yanmar, Hatz and FPT diesel engines (horsepower from 5 to 3,000, liquid and air-cooled options for all types of applications).
Roger Markwardt will head the new division.

Cargotec Buys Aker Mooring and Loading Systems Business

Aker Solutions agreed to sell its mooring and loading systems business to Cargotec for $242m. The unit, known for the Pusnes brand name, provides mooring equipment, loading and offloading systems, as well as deck machinery for the global offshore and shipping markets.

Cargotec's MacGregor Acquires Hatlapa

Cargotec said that its MacGregor business has completed the acquisition of privately owned Hatlapa, a leading provider of merchant ship and offshore deck equipment. Cargotec announced the intention to acquire Hatlapa in July 2013 in a transaction valued at approximately $215.5m. The acquisition further strengthens MacGregor's line of winch products as well as expands the offering to include steering gear, compressors and deck handling equipment. Hatlapa will be integrated into MacGregor's existing operating structure and its results will be consolidated into MacGregor's financial figures as of November 1, 2013.

OceanSaver BWT Earns USCG and ISO Approval

OceanSaver achieved a certification double, with the news that its Mark II Ballast Water Treatment (BWT) system has achieved U.S. Coast Guard (USCG) approval, while the company itself has achieved ISO 9001:2008 certification. Based in Drammen, Norway, OceanSaver provides efficient and reliable BWT systems for medium and large vessels, such as VLCCs, LNG Carriers and a variety of tankers and bulk carriers, among others.

OxyClean Gets USCG Approval

On October 11, 2013 DESMI Ocean Guard's ballast water treatment system OxyClean was granted U.S. Coast Guard AMS acceptance. The AMS acceptance covers all salinities ranging from freshwater to marine water. This is the first time the USCG has released an AMS acceptance that covers all salinities, as all previously released acceptances are valid in only marine and brackish water, and hence not valid in freshwater.

Erma First BWTS Receives AMS Acceptance from USCG

ERMA FIRST S.A. received the acceptance letter from USCG, receiving its AMS Acceptance letter on October 11. The ERMA FIRST BWTS is compatible with global legislations and conventions, international requirements and restrictions.

AMS approval is one more reward and ascertainment that ERMA FIRST

ERMA FIRST BWTS is an electrolytic system which incorporates an advanced separation stage based on hydrocyclones.

The separation stage of the system is a unique method of stable operation, achieving extreme sediment removal, while warranties no clogging risk. Its excellent design offers to the user minimal maintenance costs since it is consisted of no moving parts and thus requires no spare parts. The system has been designed to offer low energy consumption in order to reduce environmental impact. It has been carefully formed for easy installment.

Canada's Most Powerful Tug Built With ShipConstructor

As a 100 metric-ton bollard pull ice class tug, the OCEAN Tundra is reportedly the most powerful harbor tugboat to ever be built in Canada. SSI's ShipConstructor CAD/CAM application was used to construct this vessel, as SSI client Robert Allan Ltd. produced the design and SSI's dealer, Navware, and the associated marine engineering firm, Navtech, worked with OCEAN Industries during the production design and engineering of the tugboat.

The project was so successful that OCEAN Industries decided to standardize on using ShipConstructor for future projects. In particular, Ocean Industries was impressed with how ShipConstructor is a specialized shipbuilding application with productivity enhancing features for facilitating engineering and construction. The software's advantages regarding 3D modeling, piping, electrical cables and ventilation were noted. Also, Ocean Industries appreciated ShipConstructor's capabilities for the automatic generation of manufacturing bills of materials, the ability to automatically number parts for cutting and assembly, and the ability to create a build strategy for the construction of the ship. OCEAN Industries found that these features really paid off in terms of increased productivity in the shipyard.

Aker Arctic, Navis Sign DPS for Ice Ops Deal

Aker Arctic Technology and Navis En-


Secretary General Kuba Szymanski

InterManager Welcomes Hollywood Focus on Seafarers

As the new Hollywood movie Captain Phillips premiered globally, InterManager welcomed the focus the movie brings to the role of the seafarer. Captain Phillips, which stars Tom Hanks in the title role, retells the story of the kidnapping by Somali pirates of the U.S.-flagged containership Maersk Alabama. InterManager, the international trade association which represents the world's ship and crew managers, says the movie's worldwide appeal will raise the profile of seafaring and help broaden understanding of what a life at sea is like. Secretary General Kuba Szymanski said, "Seafarers are a hard-working and brave group of people who risk their lives ensuring goods are transported around the world. I am heartened to hear high-profile people like Tom Hanks explaining how this movie has helped them to better understand the importance of shipping and seafaring."

gineering signed an agreement on joint development of Dynamic Positioning systems for ice operation. The companies plan to jointly develop next-generation DP-system technology tailored for ice operation by utilizing their core know how and technologies. The development includes improved control algorithms, testing of the systems and using new more intelligent technology to overcome the ice challenges. The development work will take place in close cooperation with Aker Arctic Technology in Helsinki and Navis Engineering R&D Center in St. Petersburg. The outcome is planned to provide more energy efficient and capable and safe DP-systems, specifically developed for the ice operation. The parties believe that in longer term demand for DP applications in ships intended for ice covered waters will increase and simultaneously open up new possibilities for the operators in ice covered waters.

Delta Wave Opens New Branch

Delta Wave Communications, LLC. said its Golden Meadows, Louisiana branch office is now in full gear, serving that area, as well as Port of Fourchon for marine electronics equipment and service needs.

U.S. Court Case vs. Bollinger Dismissed

The United States filed a complaint against Bollinger Shipyards, Inc. in July 2011 based on allegations that "Bollinger knowingly misled the Coast Guard to enter into a contract for the lengthening of Coast Guard cutters by falsifying data relating to the structural strength of the converted vessels." The case was dismissed by U.S. District Judge Sarah Vance on October 21, 2013.

Chris Bollinger, President of Bollinger Shipyards, Inc., said, "All of us in the Bollinger Shipyards family are gratified by the court's thorough and well-reasoned decision dismissing with prejudice the Department of Justice's allegations against Bollinger relating to our work on the Deepwater project. We look forward to putting this chapter behind us and to focusing our efforts on best serving our customers' needs, including those of the Coast Guard and our other customers."

Prior to the court decision, Bollinger has not discussed the case publicly, and the company said it will not have any further comment at this time, stating, "We believe the public record speaks for itself."

Korean Coast Guard Chooses MTU Propulsion

MTU was chosen by the Korean Coast Guard (KCG) to provide propulsion and onboard power for a new class of patrol vessels in its ever expanding and modernizing fleet. The new 5,000-ton displacement patrol vessel will be powered by four MTU 20V1163M94 engines in a Combined Diesel and Diesel (CODAD) propulsion configuration, with onboard power provided by four 12V4000M23S gensets. The first of the new class of vessels will begin service in 2016.

The newest MTU Series 1163M04 engine has upgraded features with a common rail fuel injection system, an advanced electronic engine management system and an improved combustion process to meet the present IMO2 emission regulations. With its improved lifecycle cost, compact design and best-in-class power density and acceleration characteristics, theMTUSeries1163-04 engine sets the industry benchmark.

Raytheon Anschütz Launches New Gyro Compass

With the new Horizon MF the German navigation system manufacturer Raytheon Anschütz launches a new generation gyro compass which can be operated free of maintenance.

Horizon MF is Raytheon Anschütz' new strap down compass system which uses Hemispherical Resonator Gyros (HRG) to measure angular rates for heading calculation. In a strapped-down system angular rate gyros and accelerometers are not gimballed but mounted stationary in a housing. The sensor measures angular rates and accelerations in three axes. Based on these measurements sophisticated software algorithms compute heading but also roll and pitch. Horizon MF comes as a maintenance-free (MF) sensor with an outstanding lifetime performance, the manufacturer claims. Its Mean Time Between Failure (MTBF) value is more than 100,000 hours which is a multiple of the MTBF values of optical but also classical mechanical gyros bringing forth an outstanding long lifetime and long-term stability gyro compass for seagoing vessels. As part of a gyro compass system Horizon MF provides the same advanced functions like heading selection, heading monitoring, automatic switch-over functions, an independent transmitting magnetic compass and individual speed error correction which are well known for Anschütz gyro compasses. Horizon MF is desugbed to seamlessly integrates with the Anschütz Standard 22 gyro compass. Being the inventor of the mechanical gyro compass, Raytheon Anschütz is leader for gyro compass technologies. Standard 22 is the world's most popular gyro compass, sold and installed more than 12,000 times. Horizon MF complements the Raytheon Anschütz gyro compass portfolio.

www.raytheon-anschuetz.com

Emsys Upgraded to Measure Mass Emissions Rates

WR Systems, Ltd. (WR) already has Type Approval (ABS) for the measurement of mass emissions using its laser-based Emsys Emissions Monitoring System (EMS). The latest upgrade uses in-stack exhaust gas mass flow sensors to measure the total output, and unique calculations provide stack emissions rates in kilograms per hour (kg/h) and total mass emissions in kilograms and metric tons (kg/ metric tons) for each measured gas, including CO2. WR said it has received a significant number of orders for Emsys emissions mass flow systems for new-build contracts in the Far East. WR claims their current order book stretches well into 2015 and is bolstered by many recent contract awards from both domestic and international customers.

www.emsysmarine.com

Thuraya SatSleeve Transforms iPhone into Satellite Phone

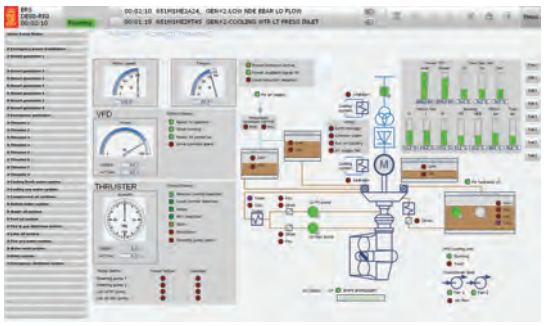
Thuraya SatSleeve supports the diverse communications needs of iPhone users. Ensuring connectivity through phone calls and SMS via satellite mode, Thuraya SatSleeve brings satellite communications to the iPhone. Simply dock the iPhone into the SatSleeve to access satellite connectivity. Available in 12 languages, the SatSleeve App allows users to easily integrate iPhone address books for satellite calls and text messages. An additional feature is that SatSleeve acts as a backup battery for the iPhone. The SatSleeve App is available as a free download from the Apple App Store.

www.globalsatellite.us

Drilling Rig and Ship Simulator

Kongsberg Maritime introduced two new Diesel Electric models for its Engine Room Simulator, K-Sim Engine (previously Neptune). The DE88 Semi-Submersible Drilling Rig model, containing eight Wärtsilä 16V26 engines and eight thrusters, is already available, while the DE66 Drill Ship model, simulating full operation of six MAN 16V32/40 diesel generators powering six thrusters, will be released in Q1 2014.

www.km.kongsberg.com



Martek: "BNWAS Password Protection is Essential"

The recent announcement that the grounding of MV Danio on the Farne Islands off the Northumberland coast on March 16 was due to the ship's Bridge Navigation Watch Alarm System (BNWAS) being switched off has been highlighted by Martek as yet another example of the need for password protection on BNWAS. Martek pointed out that the IMO's BNWAS performance standards set out in MSC.128(75) state that "the means of selecting the Operational Mode and the duration of the Dormant Period (Td) should be security protected so that access to these controls should be restricted to the Master only." Most manufacturers include a physical key to lock the system. Unfortunately, this does not address the need for the controls to be restricted to the master only since any crew member is able to remove the key and take the BNWAS out of operational mode.

www.martek-marine.com

NORTHROP GRUMMAN

Northrop Grumman Radars for USN

Northrop Grumman won a contract by the U.S. Navy to supply three AN/SPQ-9B radar systems for amphibious and Arleigh Burke class ships. Under the $20.4m contract award, Northrop Grumman will supply three AN/SPQ-9B radar systems for delivery in the second quarter of 2015. This contract adds to the 53 radar systems the company has already delivered, or is under contract to deliver. Northrop Grumman began low-rate initial production of the AN/SPQ-9B in 2000 and full-rate production in 2004. The high-resolution, X-band AN/SPQ-9B radar system will improve the vessels' ability to defend against small high-speed threats, such as surface-skimming anti-ship missiles, and will be integrated with the ships' fire-control systems.

www.northropgrumman.com

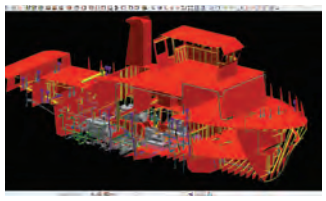
Imtech Debuts SeaPilot 76

Imtech Marine introduces the new multifunctional SeaPilot 76. SeaPilot 76 can be turned into a fully approved combined sea and river pilot and can be connected to both proportional and on/off valves. This makes the modernized Seapilot 76 a good addition to the Sigma-line of Radio Zeeland. The SeaPilot 76 is suitable for the fishing industry as well as inland, coastal and deepsea shipping.

The Seapilot 76, as well as its predecessor SeaPilot75, was developed in close cooperation with Radio Zeeland DMP. The collaboration between Imtech Marine Netherlands (formerly Radio Holland) and Radio Zeeland DMP started 20 years ago.

www.imtech.com/en/marine

FORAN in Indonesia



Stasiun Teknik, a newly created design office from Batam (Riau, Indonesia), selected FORAN as its main design tool for marine consultancy. The engineers and designers have been previously involved in ship design from other companies, and their knowledge allows Stasiun Teknik to successfully accomplish the design from a large variety of ship types and scopes of supply. Their capability covers from initial to production design, and includes steel structure, outfitting and machinery, HVAC, auxiliary structures and electrical design. FORAN System in its latest release, the V70R2.0, guarantees that the designers knowledge is properly applied to the single 3D model database, allowing the critical coordination among all the disciplines within the ship.

www.sener.es

Raymarine Autopilot

Raymarine's new Evolution EV-2 drive-by-wire autopilot system has been certified for use with SeaStar Solutions' Optimus EPS and Optimus 360 electronics steering systems. Optimus EPS systems provide effortless electronic power steering, while Optimus 360 systems add 360-degree maneuvering capabilities using a joystick controller. Both use state-of-the-art CAN bus networking for steer-by-wire control. The Evolution EV-2 autopilot system delivers sharp course keeping and simple operation. Evolution's innovative EV-2 sensor core connects directly to the Optimus CAN bus network. Easy to install, the Evolution autopilot uses simple Dockside Wizard and Automagic calibration.

www.raymarine.com

Jeppesen Updates VVOS Software

Jeppesen has launched updated versions of its Voyage and Vessel Optimization Solution (VVOS) and FleetManager software. VVOS Version 2.3 voyage optimization product is enhanced by incorporating Emission Control Area (ECA) boundaries and adding restricted RPM zones. FleetManager Version 1.4, a shoreside fleet management product, also features improved performance analysis and reporting tools. Jeppesen FleetManager 1.4 has been enhanced to meet the needs of today's shipping customers, with new reporting features customized to the needs of vessels and shore side offices. FleetManager 1.4 is designed to provide accurate, reliable data for a range of ship performance parameters. It allows individual customers to focus on data most important to them and to report it according to their business requirements.

www.jeppesen.com

Harris CapRock & Carnival

Harris CapRock Communications signed a five-year contract with Carnival Corp. to provide communications services onboard more than 100 cruise ships in its 10 cruise line brands. Harris will deploy a fully managed, end-to-end Very Small Aperture Terminal (VSAT) solution utilizing the latest generation of iDirect technology, via a hybrid C- and Ku-band solution. Each ship will be equipped with stabilized antenna systems to provide the optimal level of flexibility and availability. Bandwidth levels will be higher than what was previously delivered to each fleet, which accommodates new service requirements set by Carnival for its guests and crew, as well as for new entertainment solutions across the 10 cruise line brands.

www.harris.com

Computer Gaming & Maritime Training

Videotel is incorporating a new form of training delivery, designed to respond to the demands of the post internet age. It is moving to the ultimate in interactivity, by using gaming technology for serious purposes. Using serious games technology, Videotel is putting the learner into a real life scenario, enabling them to apply their knowledge to specific situations under realistic time pressures. The new Enclosed Spaces training course is designed to build on existing Videotel/Mines Rescue material. However it moves a step further by putting the learner into a realistic scenario which enables them to apply their knowledge to specific situations, for both training and assessment.

www.videotel.com

Carlisle & Finch SmartVIEW Technology

New from Carlisle & Finch, SmartVIEW is a Microprocessor-based Control System which allows Carlisle & Finch Products to be controlled from any screen on board the ship or from a remote PC in another location. The NightFINDER is the combination of a high Intensity Searchlight and Night Vision Camera integrated onto the same Pan/Tilt Base. SmartVIEW enables NightFINDER, as well as any of their standard searchlight products, to be controlled through the Ship's Integrated Glass Bridge. SmartVIEW technology also provides the following additional benefits as well: proportional-speed multifunctional joystick, joysticks which "intelligently switch" from searchlight to searchlight, an ethernet connection allowing digital control throughout the Ship's IT network, and remote internet control from any PC throughout the world.

www.carlislefinch.com

Thomas Gunn Unveils New Digital Chart Management System

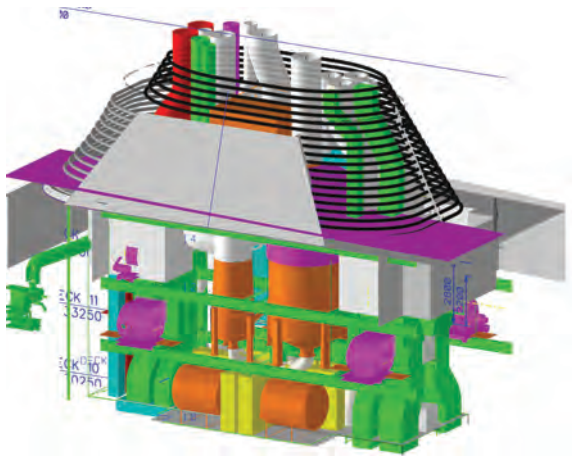
With chart and nautical publication management highlighted as one of the most common reasons for deficiency detentions by Port State Control (PSC), ship operators are calling for new and effective navigation solutions. The features of Thomas Gunn's new Voyager 4 digital chart management system provides ship owners and managers with the tools to ensure that Safety of Navigation standards on board meet PSC and vetting inspection requirements. New Voyager is a complete British Admiralty (BA) update service that includes both the Annual Summary of NMs and Cumulative List of NMs as well as NAVAREA warnings, Loose Leaf publication updates, updates for BA charts and updates for both AVCS and the Admiralty Information Overlay (AIO). It also comes complete with file compression to increase efficiency and minimize data transmission costs and free access to Thomas Gunn's Vessel Management Service – a web portal for ship managers to view individual vessel holdings and monitor a vessel's update and supply status. Enhancements in Voyager 4 include new route-planning tool to make it even easier to identify, update and download information needed for a vessel's voyage including vessel traffic separation schemes and access to added value information such as piracy and port information all via a single chart based interface; new NAVAREA warnings to provide a complete update service; new AVCS and the AIO display providing access to global Temporary and Preliminary Notices and the Admiralty's unique safety checks. Voyager 4 was released into the market in May 2013.

www.globalnavigationsolutions.com

CM-1000 Series: Smart Fluid Handling Tech

Colfax Fluid Handling introduced an Active Valve Control option to its Smart Technology CM-1000 Series intelligent sea water cooling system controller. The CM-1000 Series with optional Active Valve Control may be applied to both newbuild and retrofits. Introduced in April, the CM-1000 Series is designed to enhance shipboard sea water cooling system pumping efficiency while lowering operating and maintenance costs and maximizing uptime. The CM-1000 Series with Active Valve Control offers potential energy savings of up to 85%, and it can reduce maintenance by up to 50 percent and provides safer operation, return-on-investment and long term savings for total ownership. The CM-1000 Series with Active Valve Control uses sensors to monitor real-time operating conditions such as temperatures in the freshwater cooling loop, as well as the pumps' suction and discharge pressure. The sensor signals enable the CM-1000 Series controller to regulate the flow of sea water to the coolers according to varying heat loads from the main engine and generators. The CM-1000 Series controller checks pump status based on the pumps' performance curve, then opens and closes valves in the sea water cooling system to adjust the pumps' duty point for optimal operation. In the case of a 3 x 50% pump setup, Active Valve Control allows for an intelligent cascading pump operation. Because valve adjustments are made automatically, the risk for incorrect manual valve settings is eliminated and incremental energy savings and overall system efficiency are enhanced.

More information is available at **smart.colfaxcorp.com/CM1000** along with the CM-1000 Simulator Calculator that calculates real-world energy savings and CO2 emission reductions for specific Atlantic, Pacific and Indian Ocean routes, based on vessel type and size, water temperature, energy cost and minimum pressure.



Paperless Navigation

Transas Hellas agreed with Minerva Marine to equip its fleet with ECDIS and official charts aiming to shift within a specified timeframe to paperless navigation. In addition to the premium line of Transas ECDIS and Transas Admiralty Data Service TADS (official ENCs), Minerva Marine decided to deploy additional back up arrangements both for hardware and software, including Transas TX-97 vector charts.

Minerva Marine Inc. will also implement satellite tracking of the fleet through the Transas FleetManager Online which will enable, at the final stage, continuous monitoring of the fleet charts collection update status on each vessel.

www.transas.com

TNKC Fleet & BASS Software

BASS won a contract for a fleet-wide system upgrade for the subsidiary of the K-Line group Taiyo Nippon Kisen Co., Ltd. (TNKC). With this upgrade, 107 TNKC vessels will operate on the BASSnet 2.8 Fleet Management System. The ship management company has been operating on BASSnet 2.0 since 2001. TNKC has been enjoying the benefits of optimizing its shipping operations with BASSnet Fleet Management Systems for 12 years. These include the pioneering version of BASSnet SAFIR, a module that streamlines and automates safety information reporting, and BASSnet 2.0, which features multi-level information management solutions such as Easy Info.

www.bassnet.no

Ecospeed Fuel Savings Calculator

Ecospeed displayed the "CLEAN SHIP – EFFICIENT SHIP – GREEN SHIP – PARTNERSHIP" concept during Europort. CLEAN SHIP – Ecospeed can be cleaned rapidly and will only improve in smoothness with each cleaning. EFFICIENT SHIP - The concept is supported by the Ecospeed fuel savings calculator. GREEN SHIP - Ecospeed offers a TBT-free, copper-free and biocide-free solution for the protection of the underwater hull. PARTNERSHIP –covers the in-water cleaning service availability by Hydrex on major shipping routes like the North Sea and Baltic Sea.

www.hydrex.be

Cobham Touchscreen Navtex

The new SAILOR 6390/91 Navtex System from Cobham SATCOM is now available to order. As a black box system, with separate touchscreen user-interface, the SAILOR 6390/91 Navtex System introduces a new approach that Cobham says enhances safety and efficiency, while being fully GMDSS compliant as a standalone device or part of a SAILOR 6000 GMDSS Series installation. SAILOR 6390/91 Navtex follows the recently released SAILOR 6280/81 AIS System, as the second product group in a new series of 100% network integrated SAILOR products. The SAILOR 6391 Navtex System consists of the SAILOR 6390 Navtex Receiver (available separately), which receives Navtex messages on the international Navtex frequencies 490 kHz, 518 kHz and 4209.5 kHz, and the SAILOR 6004 Control Panel, a 7" touchscreen that provides excellent viewing clarity in all light conditions so all messages can be seen and understood.

www.cobham.com

Boatracs' BTConnect AIS

Boatracs BTConnect AIS extends the functionality of BTConnect by integrating real time messaging and vessel tracking with AIS data on a single display. The AIS Man Overboard (MOB) Alarm Notification System, a joint solution development effort between Boatracs and Orolia sister company McMurdo, is a safety solution that enables distress signals from McMurdo's Smartfind MOB AIS beacons to be displayed on BTConnect software for accelerated emergency response.

boatracs.com

GE Dynamic Positioning System

New software from GE's Power Conversion business that enables its Dynamic Positioning (DP) systems to save fuel and put less wear and tear on vessel propulsion equipment is on the shortlist to win an Institution of Engineering and Technology (IET) Innovation Award this year. "Energy Efficient Dynamic Positioning For Ships" was developed from a comparison of concepts through to final production code using model-based design. The new mode was entered in the Model-Based Engineering category for the IET Innovation Awards, which attracted more than 400 entries. During development of the new Energy Efficient DP, GE Power Conversion used model-based engineering to allow the production controller to be used in simulations to ensure accurate results. Studies making use of weather patterns for a full year showed a 12% reduction in fuel use could be expected for representative scenarios.

www.gepowerconversion.com

Robotic Tube Cutting

SMT Systemtechnik GmbH offers a novel robotic tube cutting system. A computer controlled machining system was delivered mid-year to the Polish shipyard Energomontaz Polnoc Gdynia (EPG). Specializing in ship repair and ship conversion EPG shipyard in Gdynia has begun to expand its production profile to the offshore and on special steel products. On the robotic tube cutting system by SMT pipes are mainly intended for the construction of offshore wind turbines to be processed. “We have been able to push on with the job for the EPG throw the door to the growing offshore market,” commented Roland Rüb, sales managers and project developers of SMT Systemtechnik GmbH.

www.smt-systemtechnik.eu

New Brakes from Wichita Clutch

Wichita Clutch added the air cooled, spring-set, air released AirMaKKs SSB high torque brakes to its AquaMaKKs family of clutches and brakes. The AirMaKKs SSB is designed to provide low speed braking assistance in applications including conveyors, cranes and drawworks where they serve as a main brake that provides both parking and E-stop braking functions. Units feature three-part epoxy marine-grade paint and corrosion-resistant coatings for added protection on offshore rig applications. AirMaKKs brakes, featuring stainless steel torque plates, are also available for marine deck applications where sea spray and direct seawater splash are prevalent.

www.wichitaclutch.com

New PowerShark Tool Eats through Biofouling

The PowerShark WB3000, a new rechargeable submersible handheld tool from Waveblade, removes unwanted growth in seconds. Oscillating at a 3,000 rpm frequency with additional harmonics, the tool’s cleaning head actually breaks the chemical bond between materials. The waterproof tool operates both on land and underwater, with a 20-ft. depth rating. The PowerShark WB3000 tool from Waveblade, Inc., measures 16.5” x 3” x 4.3”, while its battery measures 4.5” x 7” x 8.5”. Tool, blade and battery together weigh under 6 lbs. The kit, including PowerShark tool with battery pack and charger, three blades and storage bag, retails for $995.

www.waveblade.com

Home Study Programs

If there’s anything Capt. Guy Sorensen learned in his decades of working with professional mariners it’s that they learn in a variety of ways, times and places. “That’s why we launched our home study programs,” said Sorensen, who founded the Virginia-based Chesapeake Marine Training Institute in 1992. Sorensen offers several home study programs with various options, mainly to prepare deck officers and engineers. The 500/1600 Master/Mate Inland or Near Coastal program prepares mariners to earn their license as a deck officer serving as Master or Mate on vessels not exceeding 500 or 1600 gross registered tons and operating within inland or near coastal waters.

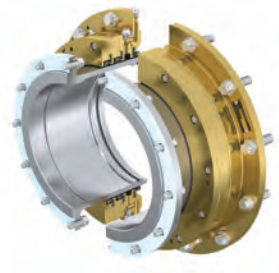
www.chesapeakemarineinst.com

VIKING Expands Training

Saatsea, now renamed as VIKING Saatsea, addresses the need of shipowners and operators to continuously train their crew by offering a combined solution that manages planning and implementation of onboard training as well as the documentation. One example is the requirement for annual onboard training of all Emergency Rescue and Recovery Vessel (ERRV) crew on vessels operating out of Denmark, Norway and the U.K. According to VIKING, it offers a system that manages both onboard training and documentation. The cloud-based mobile solution ensures that the system always works, even when the vessel is not on the internet. The information is synchronized automatically whenever the vessel has the opportunity to come online.

www.viking-life.com

SUPREME Athmos Zero-Pollution Seal

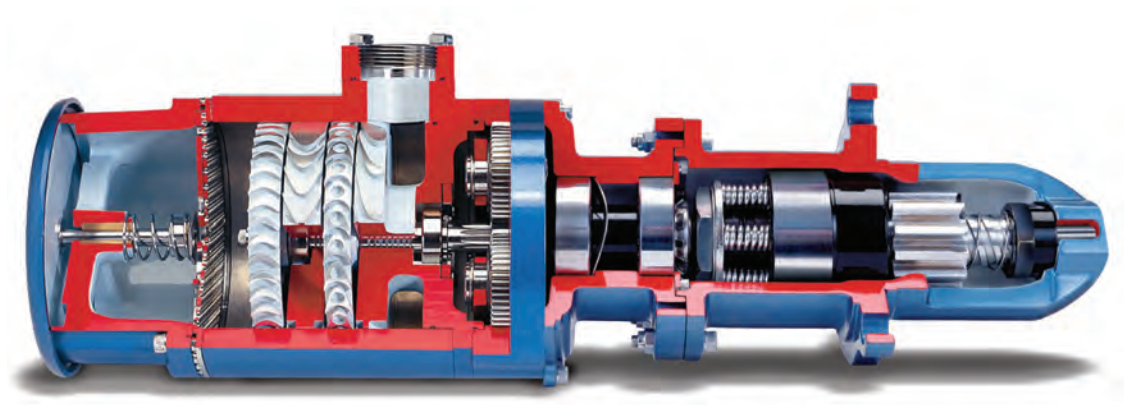


IHC Sealing Solutions launched the zero-pollution SUPREME Athmos seal, a seal designed to enable ships with limited draft up to five meters to prevent oil from being emitted into the environment. Water is prevented from entering the system by collecting any leakages from the seal into a drain tank. Once full, this tank is automatically drained into the vessel’s general waste oil tank. The SUPREME Athmos seal has a fail-safe option incorporating a condition-monitoring function. In the event of the system failing, it switches to the normal sealing mode, the drain tank captures the little oil that the seal uses and the tank indicates when it should be emptied.

www.ihclagersmit.com

New Inertia-Engaged Turbine Air Starter

TDI introduced a new, inertia-engaged turbine air starter designed to improve the reliability of mid size engines (up to 4,882 CID/80 Liters) on marine vessels, as well as engines in other industries. The signature characteristic of the vaneless, TurboTwin T50-I is the 100% starting performance it delivers because of the inertia engagement. “With inertia-engaged air starters there is never an abutment causing an abandoned start attempt, meaning the design of the air starter assures pinion engagement every time. This translates to 100% starting reliability,” said Dave Rawlins, TDI Senior Product Manager. “We have tens of thousands of inertia-engaged starters in the field. The new Model T50-I completes a mid-range product offering with additional performance in a smaller package than either the Model T100-F or the original 52 Series starters.” The T50-I was built in response to marine and mining markets which demand the extra reliability of an inertia starter without the need for engagement controls. T50-I fits on mid-sized engines like the Caterpillar 3400, 3500 and C-175; Cummins KTA 38 and 50, and MTU/Detroit Diesel 2000 and 4000 Series. The simple design allows for one part number to cover a wide range of engines and applications commonly found in many large fleets. It also features TDI’s TURBOTWIN turbine design with open air paths which allow large particles, pipe scale and other contaminants to pass right through the starter instead of getting lodged inside and potentially causing starter failure.



www.tdi-turbotwin.com

2014 Editorial Calendar

MARITIME REPORTER AND ENGINEERING NEWS

ISSUE	EDITORIAL		BONUS DISTRIBUTION
JANUARY **Ad Close:** Dec 20	**Ship Repair & Conversion Edition** **Market:** U.S. Navy: Ships of War **Technical:** Marine Drives: Gears, Thrusters, Waterjets & Propellers MaritimePropulsion.com **Product:** Marine Electronics Equipment & Supplier Guide MarineElectronics.com **Special Report:** Future Marine Fuels & Emission Scrubbing Technology		**Arctic Technology Conference** Feb 10-12, Houston, TX
FEBRUARY **Ad Close:** Jan 24	**Cruise Shipping Edition** **Market:** Marine Accommodation & Interior Outfit **Technical:** Satellite Communication MarineElectronics.com **Product:** Marine Coatings & Corrosion Control **Special Report:** Clean Water Solutions: Ballast Water Treatment, Black, Grey & Potable Water		**Cruise Shipping Miami** March 10-13, Miami, FL **ASNE DAY** Feb 20-21, Arlington, VA
MARCH **Ad Close:** Feb 21	**U.S. Coast Guard Annual** **Market:** RIB & Patrol Boat Report **Technical:** Marine Salvage & Recovery **Product:** Shipboard Fire Suppression Systems **Special Report:** Software Solutions: Remote Monitoring, Condition-based Maintenance & Control		**CMA Shipping 2014** March 17-19, Stamford, CT **Workboats Exchange** April 13-16, Bonita Springs, FL **Sea-Air-Space** April 7-9, National Harbor, MD
APRIL **Ad Close:** Mar 21	**Offshore Edition** **Market:** Making of the Modern OSV **Technical:** Marine Fuel Selection Guide **Product:** Specialty Cranes: Heavy Lift to Cargo **Special Report:** The World's Biggest: Floating Liquefied Natural Gas (FLNG)		**Offshore Technology Conference (OTC)** May 5-8, Houston, TX **Marine Money Houston** May 7, Houston, TX
MAY **Ad Close:** April 25	**Marine Electronics Edition** MarineElectronics.com **Market:** Training & Education **Technical:** Marine Power Guide MaritimePropulsion.com **Product:** Deck Machinery, Winches and Ropes **Special Report:** Oil Spill Response & Recovery		**Posidonia** June 2-6, Athens, Greece **HiperCraft** June, Virginia Beach, VA
JUNE **Ad Close:** May 23	**Annual World Yearbook** **Market:** Maritime Simulation & Training Centers MarineElectronics.com **Technical:** Marine Firefighting, Safety & Salvage **Product:** Marine Spare Parts Guide **Special Report:** 4th Annual Global Maritime Photo Contest		**Maritime Reporter Celebrates "75"** MR turns 75 in 2014. This special standard-size magazine supplement in the June edition traces the history, evolution & future of • shipbuilding & design • marine propulsion • marine electronics & more! 
JULY **Ad Close:** June 25	**Offshore Energy Structures & Systems** **Market:** Classification & Ship Registries **Technical:** ECDIS MarineElectronics.com **Product:** Maritime Tools: Welding & Cutting **Special Report:** Emerging Marine Propulsion Tech MaritimePropulsion.com		
AUGUST **Ad Close:** July 24	**Shipyard Edition** **Market:** OSV Design & Construction **Technical:** Heavy Lifting Solutions **Product:** Clean Water Technology **Special Report:** Ship Maintenance & Retrofit		**SMM** Sept 9-12, Hamburg, Germany
SEPTEMBER **Ad Close:** Aug 22	**Marine Propulsion Edition** MaritimePropulsion.com **Market:** Maritime Security Technology **Technical:** Condition Based Monitoring MarineElectronics.com **Product:** Marine Anti-Fouling Coatings **Special Report:** The Arctic: Challenges & Opportunities		
OCTOBER **Ad Close:** Sept 19	**Marine Design Edition** **Market:** Dredging **Technical:** Pumps, Pipes, Valves & HVAC **Product:** CAD/CAM **Special Report:** The Automated Ship: Command & Control MarineElectronics.com		**SNAME** October 22-24, Houston **SHIPPINGInsight** Stamford, CT
NOVEMBER **Ad Close:** Oct 24	**Workboat Edition** **Market:** Tug, Tow and Pushboats: Brown Water Workboats **Technical:** Deck Machinery, Winches & Ropes **Product:** Vessel & Crew Safety Systems **Special Report:** Gulf of Mexico Builder & Supplier Guide		**International Workboat Show** Dec 3-5, New Orleans, LA
DECEMBER **Ad Close:** Nov 21	**Great Ships of 2014** **Market:** U.S. Navy **Technical:** Shipyard Automation **Product:** Maritime, Port & Harbor Infrastructure & Security **Special Report:** Marine Power Provider's Guide MaritimePropulsion.com		**Surface Navy Association** January, Crystal City, VA

BUYER'S DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyer's Directory Section, contact Mark O'Malley at momalley@marinelink.com

ALUMINUM BOATS

Metal Craft, 347 Wellington Street, Kingston, Ontario, 77552, Canada , tel:(800) 410-8464, fax:(613) 542-6515, laurence.b@metalcraftmarine.com

AUTOMATIC IDENTIFICATION SYSTEM

Saab TransponderTech AB, SE-589 41 Linkoping , tel:46 13 180000, fax:46 13 180011, Info.transpondertech@saabgroup.com

AUTOPILOT SYSTEMS

AG Marine, 5711 34th Ave NW 2nd floor Gig Harbor, Wa. 98335

BOAT BUILDING AND DESIGN

Metal Craft, 347 Wellington Street, Kingston, Ontario, 77552, Canada , tel:(800) 410-8464, fax:(613) 542-6515, laurence.b@metalcraftmarine.com contact: Laurence Bishop, www.metalcraftmarine.com

BOW AND STERN THRUSTERS

Omnithruster, 2201 Pinnacle Parkway Twinsburg,Ohio 44087 , tel:330 963-6310, fax:330 963-6325, widmer@omnithruster.com

CAMERAS

Kongsberg Maritime LTD, Campus 1 Innovation Pk.Balgownie Rd.Bridge of Don Aberdeen AB22 8GT , UK , tel:011 44 1224 226500, Bill.Stuart@kongsberg.com contact: Bill Stuart, www.kongsberg.com/cameras

CAPSTANS

Superior-Lidgerwood-Mundy, Corp., 302 Grand Ave., Superior, WI 75024, USA , tel:(715) 394-2383, stenerelli@lidgerwood.com contact: Sean Tenerelli, www.lidgerwood.com

COATINGS/ CORROSION CONTROL/ PAINT

Hempel A/S, Lundtoftevej 150 DK-2800 Kgs, Lyngby , tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com

Jotun Paints, 9203 Highway 23, Belle Chasse, LA , USA , tel:(800) 229-3538, milton.campo@jotun.com contact: Milton Campo, www.jotun.com

Tri-State Coating and Machine Co. Inc., 5610 McComas Road, PO Box 296, Salt Rock, WV V4W 3S8, USA , tel:1-800-477-4460, fax:304-736-7773, brichmond@tscminc.com contact: Beverly Richmond, www.tscminc.com

CONTROL SYSTEM- MONITORING/STEERING

Prime Mover Controls, 3600 Gilmore Way, Burnaby BC

CORDAGE

Helkama Bica Oy, Lakimiehenkatu 4, KAARINA FI-20780, Finland , tel:+358-2-410 8700, sales@helkamabica.fi

CORROSION CONTROL

CS Unitec, 22 Harbor Avenue, Norwalk, CT 11758, USA , tel:(203) 853-9522, fax:(203) 853-9921, tcarroll@csunitec.com contact: Tom Carroll, www.csunitec.com

Rustibus, 2901 West Sam Houston Pkwy, North Suite E-325, Houston, TX , USA , tel:(832) 203-7170, fax:(832) 203-7171, houston@rustibus.com , www.rustibus.com

COUPLINGS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com contact: Bob Lennon, www.centa.info

CRANE - HOIST - DERRICK - WHIRLEYS

DMW Marine Group, 1123 St Matthews Rd Chester Springs PA 19425

DECK MACHINERY- CARGO HANDLING EQUIPMENT

NABRICO, 1250 Gateway Dr, Gallatin, TN , tel:615-442-1300, brian.corbin@trin.net contact: Brian Corbin, www.nabrico-marine.com

NABRICO, 1250 Gateway Drive, Gallatin, TN 70002-4989, USA , tel:(615) 442-1300, brian.corbin@trin.net contact: Brian Corbin, www.nabrico-marine.com

Superior-Lidgerwood-Mundy, Corp., 302 Grand Ave., Superior, WI B0W 2L0, USA , tel:(715) 394-2383, stenerelli@lidgerwood.com contact: Sean Tenerelli, www.lidgerwood.com

DIESEL ENGINE- SPARE PARTS & REPAIR

Motor Services Hugo Stamp, 3190 SW 4th Avenue Ft. Lauderdale, Fla.33315

DIVING & SALVAGE

Hydrex Headquarters, Haven 29 – Noorderlaan 9 Antwerp 2030, Belgium , tel:32-3-213-5300 (24/7), fax:32-3-213-5321, hydrex@hydrex.be contact: Dave Bleyenberg, www.hydrex.be

Hydrex US, 604 Druid Rd E; Clearwater, FL, USA , tel:727-443-3900 (24/7), fax:727-443-3990, info@hydrex.us contact: Matthew Brooks, www.hydrex.us

DRILLS

Hougen Inc., 3001 Hougen Drive Swartz Creek, MI 48473

DRIVESHAFTS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL , USA , tel:(630) 236-3500, fax:(630) 236-3565, info@centacorp.com contact: Bob Lennon, www.centa.info

ELECTRIC & CONTROL SYSTEMS

Jamestown Metal Marine Services, Inc., 4710 Northwest 2nd. Ave. Boca Raton, FL 33431

ELECTRIC DRIVE SYSTEMS

Avtron, 7555 E Pleasant Valley Rd. Ste100, Independence, OH , USA , tel:216 642-1230, gabrielle.gillota@nidec-avtron.com

ENGINES

Wartsila, Ranta 2, Helsinki , tel:011 358 10 709 0000, fax:011 358 10 709 5700 contact: John Stenbergin, www.wartsila.com

FANS

Schaefer Ventilation, 1 Industrial Blvd. Suite 101, Sauk Rapids, MN

GALLEY EQUIPMENT

Jamestown Metal Marine Services, Inc., 4710 Northwest 2nd. Ave. Boca Raton, FL 33431

LOIPART AB, P.O.Box 694/Metallgatan 2-4, ALINGSAS , tel:+46 322 668 360, fax:+46 322 637 747, loipart@loipart.se

HVAC

Jamestown Metal Marine Services, Inc., 4710 Northwest 2nd. Ave., Boca Raton, FL , USA

INTERIORS

Jamestown Metal Marine Services, Inc., 4710 Northwest 2nd. Ave. Boca Raton, FL 33431

LAUNDRY EQUIPMENT

LOIPART AB, P.O.Box 694/Metallgatan 2-4, ALINGSAS , tel:+46 322 668 360, fax:+46 322 637 747, loipart@loipart.se

LIFESAVING EQUIPMENT

CM HAMMAR AB, CM Hammar AB August Barks Gata 15 421 32 Västra, Frölunda, Sweden , tel:+46 31 70965 50, fax:+46 31 497023, info@cmhammar.com , www.cmhammar.com

LIFT EQUIPMENT

DMW Marine Group, 1123 St Matthews Rd, Chester Springs, PA

MAGNETIC LIFTING SYSTEMS

Walker Magnetics, 2195 Wright Brothers Avenue, Columbus, OH , tel:603.303.0508, kknights@walkermagnet.com

MARINE CONSTRUCTION/REPAIR

Metal Craft, 347 Wellington Street, Kingston, Ontario, 77552, Canada , tel:(800) 410-8464, fax:(613) 542-6515, laurence.b@metalcraftmarine.com

MEASURMENT & CONTROL PRODUCTS

Omega Engineering, 1 Omega Drive, Stamford, CT

METEOROLOGICAL INSTRUMENTS

R.M. Young Company, 2801 Aero Park Dr., Traverse City, MI , tel:231-946-3980, fax:231-946-4772, vsherman@youngusa.com

NAV/COMM EQUIPMENT

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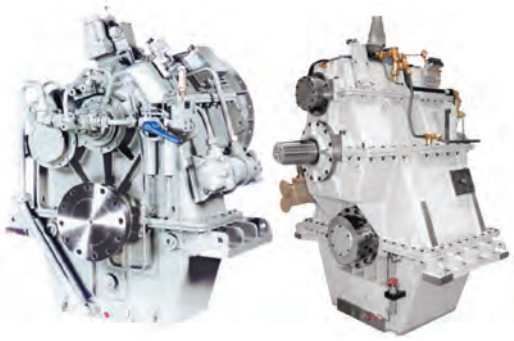

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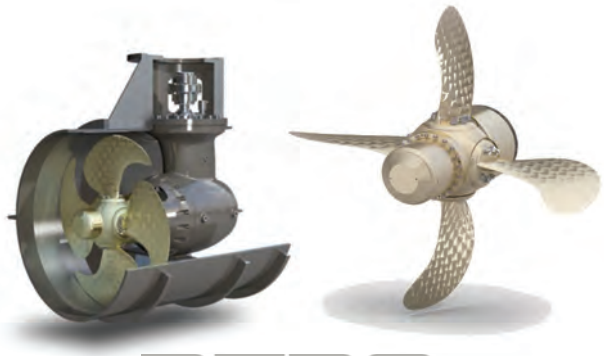

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