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MARITIME REPORTER AND ENGINEERING NEWS

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NOVEMBER 2011

Workboat Edition

FOSS
West Coast Icon Becoming Global Enviro Steward

Oil Spill Clean-Up
Elastec/American Comes Clean in "X" Challenge

Hedgehog
Cummins Launches Epic Engine Platform

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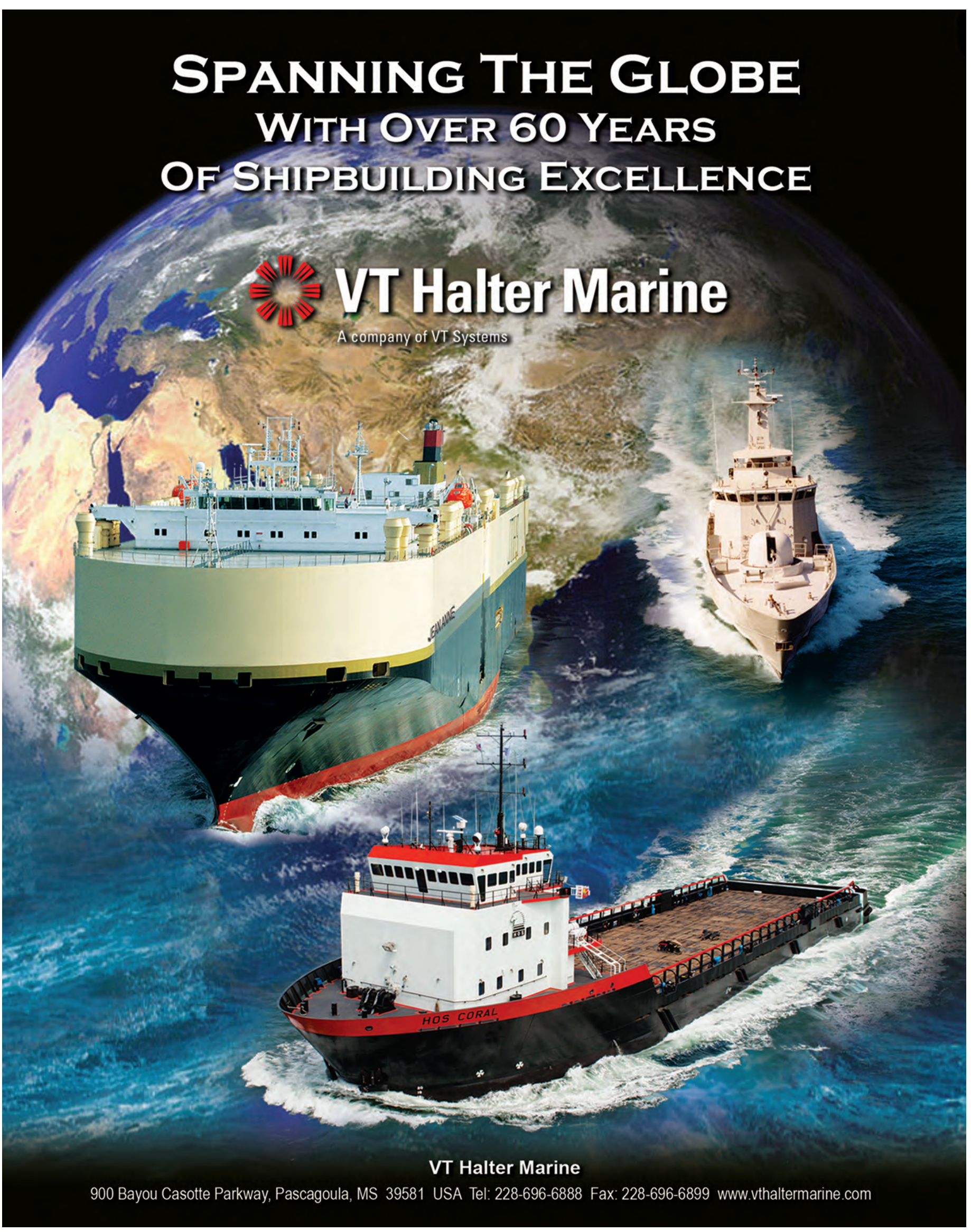

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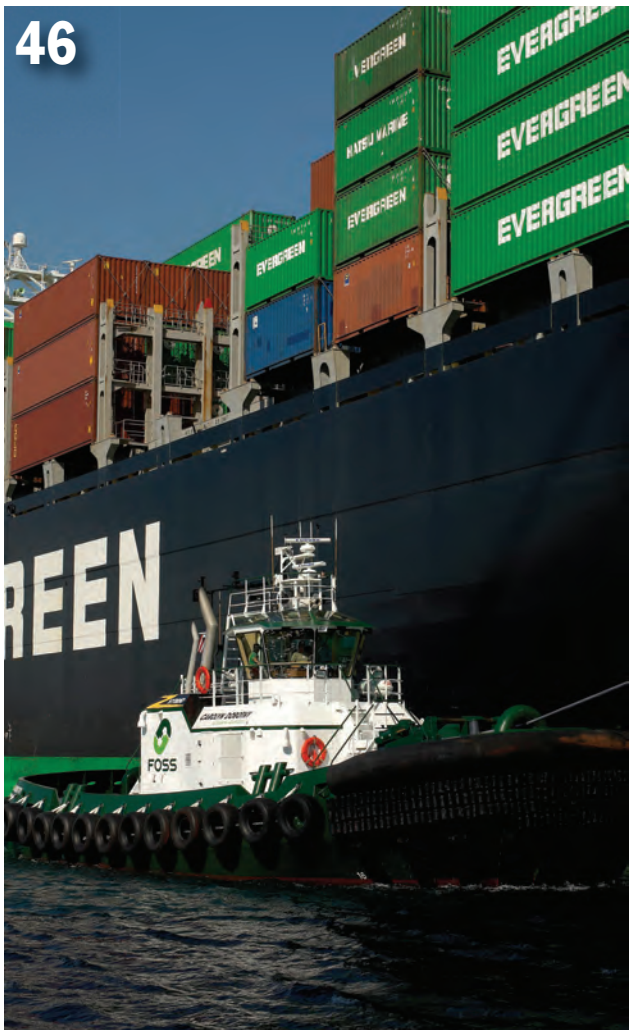

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Tel: (212) 477-6700; Fax: (212) 254-6271
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ELASTEC/AMERICAN CLEANS-UP
Winner of the Wendy Schmidt Oil Cleanup X-Challenge was Illinois-based Elastec/American, which engineered a solutions to pick up a staggering 4,670 gpm of oil in water at 89.5% efficiency. The unit is shown here going through its paces at Ohmsett – the National Oil Spill Response Research & Renewable Energy Test Facility – in Leonardo, NJ.

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ON THE COVER
The ship docking tug Navemar XIV pilot house seen through the forward staple.

(Haig-Brown photo courtesy of Cummins Marine)

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Looking For Technical Talent?
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I have read and written many times regarding both the conservative nature of the marine industry and the dearth of technical talent, specifically the lack of new blood in the broad areas of engineering and science in the United States. While the latter is true in a pure statistical vacuum, there have been several developments in just the past few months which prove an innovative spirit and technical expertise is alive and well.

Last month in New York the X-Prize Foundation held a ceremony to award the top three prizes in its $1.4m "Wendy Schmidt Oil Cleanup X Challenge." To be quite honest, before receiving the invitation, I was none too familiar with either the X-Prize Foundation or Wendy Schmidt, and I was leaning toward skipping the ceremony in lieu of shoveling out from under my heavy work load.

I'm happy that I went.

The **$1.4m "Wendy Schmidt Oil Cleanup X Challenge"** was a direct result of the Deepwater Horizon blowout and resultant oil spill in the Gulf of Mexico. The X-Prize Foundation is well versed in running high-profile contests, some offering up to $10m in prize money. In this contest it was Wendy Schmidt who stepped to the plate to fully fund the contest which bore her foundation's name. From an initial field of hundreds, 10 teams from around the globe made the final cut to develop and deliver a faster, more efficient means to remove oil from water. The 10 finalist teams – each of which travelled to New York for the awards ceremony – then had to demonstrate their cleanup systems individually during field testing over a 10-week period in the summer of 2011. Ohmsett – the National Oil Spill Response Research & Renewable Energy Test Facility – in Leonardo, NJ, which is the largest outdoor saltwater wave/tow facility in North America, served as the testing ground. While the full story and results are found starting on page 54, the performance from the winning team — Elastec/American Marine from Illinois — was startling, as this innovative company tapped its talented team to re-engineer its existing system to nearly triple the amount of oil that can be removed from water efficiently, to 4,670 gpm.

This is but one story in this edition, our "Workboat" Annual, which demonstrates the innovative spirit that you live every day. The maritime industry is faced with a number of real and serious challenges going forward, as increasing amounts of legislation, environmental concern and technical sophistication demand that companies take a serious look at their assets and operating procedures to ensure that they are well outfitted for the long run. A prime example of a company that has, and continues to innovate is the West Coast icon Foss Maritime. Last month Raina Clark spent some time with Foss CEO Gary Faber to discuss how his company's investment nearly three years ago in hybrid tug technology has paid off. In the story, starting on page 46, you will read of the trials and tribulations of bringing to bear new technology on the waterfront, but as Faber succinctly summarized: **"We believe the companies best positioned to compete for work will be those with the best environmental safety records."**

Gregory R. Trauthwein, Editor & Associate Publisher **trauthwein@marinelink.com**

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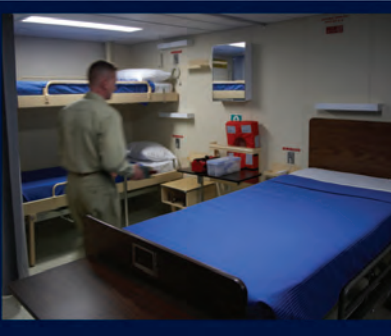

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Bulk Carrier to Ride on Bubbles to Reduce CO2 25%

Mitsubishi Heavy Industries, Ltd. (MHI) developed a new bulk carrier which it reports will enable reductions in CO2 emissions by about 25% compared with conventional bulk carriers. As the first commercial application of the new design, MHI will provide its conceptual design and green technologies to three grain carriers to be built for Archer Daniels Midland Company (ADM) of the U.S. MHI's new bulk carrier design adopts the company's proprietary Mitsubishi Air Lubrication System (MALS), which reduces frictional resistance between the vessel hull and seawater using

air bubbles produced at the vessel bottom, along with a high-efficiency hull form and enhanced propulsion system. Sumitomo Corporation of Japan has received the order for the ship construction from ADM, and Oshima Shipbuilding Co., Ltd. of Nagasaki was selected to build the ships.

Besides the MALS, which uses blowers to create air bubbles under the vessel bottom, the three grain carriers will also feature a newly designed bow shape that will reduce wave-making resistances. For propulsion, the ship adopts a system to effectively convert the main engine power into propulsion power by positioning fins forward of the propellers and placing particular grooves in the propeller boss cap. MHI developed the MALS as a key measure to reduce CO2 emissions from ships. ADM's ships will be the first case in which MHI provides the system to another shipbuilder.

The three grain carriers will be 95,000 dwt vessels measuring 237 x 40 x 12.5 m. The shallow draft of the ships facilitates the pursuit of energy savings and CO2 emission reduction efficiency by MALS. Oshima Shipbuilding will perform from the basic design work through construction based on the conceptual design and green technologies provided by MHI. Delivery of equipment related to MALS system from MHI is slated for 2014. ADM is one of the U.S.'s top-ranking grain companies. The three bulk carriers, which mark the first new shipbuilding order placed by ADM, are designed to accommodate new post-Panamax needs.

Italian-Built, Italian-Owned

The Italian marine operator Bambini, based at the Port of Ravenna, operates an extensive fleet of vessels in support of the offshore industry. These range from tugs, to supply boats and crew boats. The latter, mostly in the 30 to 35-m range, have been imported from U.S. builders. Recently it launched its first Fast Supply Vessel, the 51.75 x 9.2-m Blue Daddy, from the Cantieri Navail Vittoria in Adria on the Canal Bianco about 25 km up the Adriatic Sea along the River Po in northeastern Italy. With more than 80 years of

history in shipbuilding the CN Vittoria has worked in all materials from wood to steel and, for the Blue Daddy, aluminum. With the characteristic raked bow of most boats in this class, the hull has a nine-meter beam and a five-meter molded depth. Powered by four Cummins KTA50-M2 engines, the fast supply vessel can make 29 knots and cruises at 24 knots. The main engines each provide 1800 BHP at 1900 rpm. Capacities include 116 cu. m. of water, 71 passengers and 150 tons of deck cargo. The open after deck has a clear area 25 x 7.2 m. Auxiliary power is provided by three Cummins 6BT5.9DM powered gen sets and one Cummins 4BT3.9 emergency gen set. Sea Italia one of Italy's major Cummins dealers supplied all engines. The company is able to supply full power train solutions including gears, shafting and propellers. Classed by RINA with notation for MALTA CROSS-DYNA-POS-AUT UMS, the Blue Daddy initially served offshore platforms in the Adriatic. Later, the boat was deployed to West African waters.

MHI to Build New Generation LNG Carrier

Mitsubishi Heavy Industries, Ltd. (MHI), has agreed with Osaka Gas International Transport Inc. (OGIT), a group company of Osaka Gas Co., Ltd., and Mitsui O.S.K. Lines, Ltd to build two new-generation liquefied natural gas (LNG) carriers. The event will represent the first construction of the "Sayaendo" Series, which is designed to improve fuel consumption and maintainability through various features, including enhancement of ship structure efficiency. Two LNG carriers are slated for delivery in 2014 and 2015, respectively. Each LNG carrier measures 288 x 48.9m with an 11.55m in draft. The 138,000 gt ship is capable of carrying up to 153,000 cu. m. of LNG using four Moss-type tanks. The Sayaendo features a peapod-shaped continuous cover for the Moss spherical tanks, integrated with the ship's hull, in lieu of a conventional hemispherical cover and enables greater structural efficiency and size and weight reductions, maintaining the ship's overall strength. The continuous cover over the tanks improves aerodynamics by substantially reducing wind pressure, which serves as drag on ship propulsion. For its main power plant, the Sayaendo adopts MHI's "Ultra Steam Turbine Plant" (UST), a new turbine plant which achieves higher thermal efficiency through effective use of thermal energy by reheating steam. Together with downsizing, weight reduction and hull line improvement, the new ship is designed to achieve a 20% reduction in fuel consumption compared to conventional ships.

Length	288m
Breadth	48.94m
Draft	11.55m
LNG storage tank	Stretched Moss-type independent spherical type
Gross tonnage	138,000 tons
Deadweight capacity	75,000 tons
Launch	2014 (first vessel), 2015 (second vessel)

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Norvegia and Spagna:
New RAmparts 2500W Class Tugs for Italy

In August the RAmparts 2500W tug Norvegia was delivered by Astilleros Armon of Navia, Spain to owners, Rimorchiatori Riuniti in Genoa, Italy. Shortly afterward in early September, the second vessel of Rimorchiatori Riuniti's two boat order, the Spagna, was delivered. The RAmparts 2500W is a new variation on Robert Allan Ltd's standard RAmparts 2500 design. It was developed in collaboration with Rimorchiatori Riuniti who were looking for a compact, yet powerful shipdocking tug for their operations in the historic and busy port of Genoa. The result is a compact tug designed to provide excellent all round visibility. The design features a much wider beam than the standard RAmparts 2500 design, with an aft- biased deckhouse and wheelhouse for working under the extreme flare of modern vessels. It has a large forward working deck, and relatively low draft.

Astilleros Armon performed an admirable job constructing the vessels true to the design drawings and the quality is evident in the finished product. The tugs are built to RINA Classification requirements, with the notation C, HULL, MACH, Tug, AUT-UMS, "Unrestricted Navigation."

The Norvegia and Spagna are configured with crew accommodations for 6. The wheelhouse is sized to accommodate all the control functions with maximum visibility for the operator. The main deck accommodates two officer cabins, a mess and a galley. The lower accommodation deck, which remains above the deepest load waterline in all load conditions, features two crew cabins, WC and shower, a laundry, and a generous stores room.

Main Particulars

Length, o.a.	24.4 m
Breadth, molded	11.25 m
Depth, molded	5.1 m
Load Draft, max.	5.08 m
Fuel Oil	84,300 l
Potable water	10,100 l
Water Ballast	44,600 l
Main engines	Caterpillar 3516C
Power	1920 kW at 1600 rpm
Z-Drive	Rolls Royce US 205FP
Bollard pull	70 tons
Speed	13.3 knots

NNS Hosts Susan Ford Bales for Aircraft Carrier Update

(Photo: Huntington Ingalls Industries)

Susan Ford Bales receives a lesson in connecting instrumentation wiring during her Oct. 11 visit to Newport News Shipbuilding.

Huntington Ingalls Industries said that its Newport News Shipbuilding (NNS) division hosted a visit by Susan Ford Bales, daughter of the late President Gerald R. Ford and sponsor of his namesake ship. Bales received a briefing on Gerald R. Ford's (CVN 78) construction progress. "It has been more than a year since my last visit, and the ship has changed immensely," Bales said. "Every day it becomes a more important part of my family, especially with the loss of my mother. It's one more way to continue my father's legacy so people will understand who he was and what he was about."

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Hapag-Lloyd Launches Emissions Calculator

With the launch of the new EcoCalc, Hapag-Lloyd reports that it has become the first shipping company in the world to introduce an emissions calculator that not only shows CO2 emissions, but also those of SO2, NOx and particulate matter for a given container transport.

In addition, EcoCalc is one of the few emissions calculators in liner shipping to cover not only the ocean leg, but also the emissions of the other modes of transport for the pre-carriage and on-carriage.

EcoCalc is available for use immediately at **www.hapag-lloyd.com** and determines the emissions for every individual container transport with Hapag-Lloyd worldwide.

ClassNK: New Guidelines, Software for Container Carrier Structures

ClassNK released a new revised edition of its "Guidelines for Container Carrier Structures – Guidelines for Direct Strength Analysis", as well as a new version of its PrimeShip-HULL(DSA) software for use in designing container carriers in line with the new guidelines. ClassNK released the first edition of its "Guidelines for Container Carrier Structures" in 2003. The release of the "Guidelines for Direct Strength Analysis (Revised Edition)" mark the completion of the first phase of this project and provide updated information on carrying out Direct Strength Analysis of container carriers. The new Guidelines are available **www.classnk.or.jp/hp/Rules_Guidance/index.html**

BIW Moves 4,000-ton DDG 1000 Section

On Saturday, October 22, the shipbuilders of General Dynamics Bath Iron Works, a subsidiary of General Dynamics, completed the largest and most complex ship module movement ever executed at the shipyard. The mid-forebody section of Zumwalt, the lead ship of the DDG-1000 class of guided missile destroyers, was transported 900 feet from its assembly position inside the shipyard's Ultra Hall construction facility to the largest of the company's three shipbuilding ways. The heavily outfitted module is about 180 feet long, over 60 feet high and weighs more than 4,000 tons. This single section represents nearly one-third of the ship's overall length. In its current position, it will be integrated with three additional "ultra units" that comprise the ship's unique wave-piercing hull form. "The completion of this move was a great achievement for our workforce and a historic day for our company. The talents, skills and innovation of our employees have revolutionized how we build surface combatant ships in Bath, Maine," said Jeff Geiger, Bath Iron Works president. The DDG-1000 Zumwalt-class destroyer is the U.S. Navy's next-generation guided-missile destroyer, leading the way for a new generation of advanced multi-mission surface combat ships. The ships will feature a low radar profile, an integrated power system and a total ship computing environment infrastructure. Armed with an array of weapons, the Zumwalt-class destroyers will provide offensive, distributed and precision fires in support of forces ashore. Bath Iron Works is the lead designer and builder for the program which employs approximately 5,500 people.

Limited Liability in the *Workboat Industry*

About the Aurhot
Richard V. Singleton II, partner at Blank Rome, has been practicing maritime law for 30 years. He is recognized as a leading attorney in shipping and maritime law by Who's Who Legal and has received the highest possible rating from Martindale-Hubbell. The workboat industry has been a focus of Mr. Singleton's practice. He presently represents several workboat companies and has litigated many cases involving workboat casualties.
Contact Singleton at Tel: 212-885-5166; Email: RSingleton@BlankRome.com

The owners of tugs and other workboats are entitled to limit their liability under the Shipowner's Limitation of Liability Act, 46 U.S.C. §30501 et seq. ("Limitation Act"), to the same extent as the owners of ocean-going ships. Thus, if a workboat is involved in a maritime casualty, the workboat's owner or bareboat charterer may be entitled to limit its liability to the value of the workboat after the incident, plus any towing charges, hire, or freight still owed for the job. This limitation right obviously can be a great benefit to a workboat's owner and insurers when the damages from a marine casualty are substantial. A vessel owner's limitation rights, however, are subject to several important qualifications, three of which have special significance in the unique circumstances of the workboat industry. Each is discussed below.

"PRIVITY OR KNOWLEDGE"

A vessel owner is only entitled to limit its liability if the fault that caused the casualty is not within the owner's "privity or knowledge." This is a term of art that has been judicially defined over decades of case consideration and does not lend itself to an easy definition when a corporate owner is involved. Obviously, if senior management is aware of the fault that caused the casualty, then the fault is deemed to be within the owner's privity or knowledge. The more difficult questions concern employees further down on the corporate ladder. For example, the knowledge of an operations manager, and even that of a fleet or port captain that reports to the operations manager, will likely be imputed to the owner, but the knowledge of a vessel's master or in-house repairman would most likely not be.

The above examples illustrate that it is not always easy to predict whether the knowledge of an individual will be imputed to the vessel's corporate owner, and most "privity or knowledge" questions can only be resolved on a case-by-case basis. In the workboat industry, these questions can be even more difficult given the closer involvement by management in the operation and maintenance of a fleet and the sheer proximity of the vessels to management control. **But as a very rough guide, casualties resulting from the operational negligence of the workboat's master or crew generally will not be considered within the owner's privity or knowledge and the workboat owner would be entitled to limit.** The result, however, may well be different if the owner was notified of the matter as it was happening and became involved in the decision-making process leading to the casualty.

It is an open question whether the

knowledge of a dispatcher would be imputed to the owner, but given the purpose of the Limitation Act, persuasive arguments could be constructed that it should not be.

On the other hand, casualties resulting from a vessel's un-seaworthiness, or from negligent acts by masters or mates found to be incompetent or improperly trained, will likely be found to be within the privity and knowledge of the corporate owner. The implementation of proper procedures and appropriate delegation of functions bearing on these issues is the best way to preserve a workboat owner's limitation rights.

THE PERSONAL CONTRACT DOCTRINE

The second qualification on the right to limit—the Personal Contract Doctrine—has great significance in the workboat industry. This judicially crafted exception to the Limitation Act prohibits a vessel owner from limiting its liability for claims brought for breach of personal contractual obligations. The theory is that as a matter of policy, a vessel's owner (corporate or otherwise) should not be entitled to limit against a liability arising out of its own personal undertakings. Direct claims—even indemnity or contribution claims—can fall within the Personal Contract Doctrine and therefore would not be subject to limitation.

The doctrine can be confusing because not all contractual obligations in the shipping business are considered personal, and what is a personal contract is not always easy to identify. Almost all charters and contracts of affreightment in the workboat context, to the extent they contain warranties of seaworthiness, are personal obligations of the vessel owner, and claims for breach of those obligations are not limitable. Bills of lading, however, are not considered personal contracts. Towage contracts contain many personal obligations, such as the payment obligation, but not all breaches of a towage contract will be a breach of a personal obligation. Damages to the tow resulting from the negligence of a tug master, for example, may not be a breach of any personal obligation of the tug owner.

As the workboat industry is largely contract driven, the Personal Contract Doctrine can operate as a major restriction on the limitation rights of workboat owners. **Fortunately, a workboat owner can protect itself from application of the Personal Contract Doctrine by including in its contracts a clause stipulating that nothing in the contract is a personal obligation** and that the contracting parties agree that both are entitled to all the benefits of the Limitation Act. An experienced maritime lawyer can draft the appropriate wording if a workboat owner's form contracts do not contain such a provision.

A workboat owner also may attempt to contractually limit its liability by inserting a clause in its contracts providing that, in event of damage to the contracting party's property, the workboat owner's liability is limited to some monetary amount. These clauses have not been squarely tested in court. But judicial decisions in analogous situations suggest that such clauses have a good likelihood of being enforced, as long as the limitation amount is not punitive and bears a reasonable relationship to the transaction. The calculation of the limitation amount is tricky, but it probably should at least be some multiple of the fee for the services provided under the contract.

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THE LIMITATION FUND

The third area of limitation law having special significance to the workboat industry relates to the calculation of the "limitation fund", which is the amount to which a vessel owner may limit its liability. In the usual case, only one vessel of the limitation defendant is involved, so the limitation fund is calculated by taking the value of that vessel after the casualty and adding to it any hire or freight still owing on the voyage. In the workboat context, it is not uncommon for two or more vessels to be under the control of one tug when a casualty occurs. This raises the sometimes difficult question of the how the limitation fund is calculated.

The law historically has analyzed this question differently depending on whether the claims involved are for "tort" (negligence) or breach of contract. In tort cases brought by third parties to whom the vessel owner owes no contractual duty, the general rule has been that the limitation fund is calculated by the value of the vessel at fault. This normally is the tug, as barges usually make no decisions and take no actions on their own. The classic situation is where a tug lands a barge too hard and damages a dock, or where a barge in tow strikes and damages another vessel. In such cases, the value of the limitation fund will be the value of the tug. Albeit unusual, a barge nonetheless may bear some fault, such as where the barge is improperly lit or unseaworthy in some other respect that contributes to the casualty. In such cases, the barge's value may be included in the limitation fund.

The rule has been different in breach of contract cases. Assuming the personal contract doctrine discussed above does not prevent limitation, the limitation fund is calculated by the number of vessels in the flotilla under the same ownership. Thus, the limitation fund available for claims for damaged cargo carried on a barge, which is owned by the towing company, is not limited to the value of the tug, but also would include the value of the carrying barge. The value of any other property in the flotilla owned by the towing company, such as other barges, is also subject to inclusion in the limitation fund.

The above "tort/contract" distinction has been highly criticized. The law, therefore, is evolving toward a more modern rule that the value of all vessels in a flotilla must be included in the limitation fund—regardless of the basis of the claim—when the vessels are subject to common ownership, are engaged in a single enterprise, and are under common control at the time of the casualty.

The workboat industry presents unique circumstances. While workboat owners have the same limitation rights as the owners of ocean going vessels, the qualifications on their limitation rights are subject to, and must be understood in light of, these unique circumstances. Proper planning and the use of protective contractual provisions can assist in insuring, to the extent possible, that a workboat owner's limitation rights remain available.

Train Crews to Avoid the *ECDIS Adoption Cliff*

Training can often assume intimidating dimensions and become a worrying bottleneck in any change process or industry transformation. The ECDIS mandate is a prime example.

By Paul Elgar, Jeppesen, Product Manager for OEM services

The significance of training was underlined by José Sergio Gabrielli, head of Petrobras, when speaking about development of Brazil's Santos basin field at the 2011 NorShipping Conference. "We will have to train at least 200,000 people […]. It is a long term human resources challenge," he told Conference delegates.

Although ECDIS training may seem a little more mundane than this, it has become a major point of uncertainty in the industry ahead of the approaching mandate deadlines. Many shipping companies are struggling to find the best way to train bridge crews to use electronic charts and ECDIS.

As the final changeover date for electronic charts approaches, I feel that the shipping industry in general is not yet in-tune with the changeover to electronic navigation. While Jeppesen today has many thousands of subscribers to electronic chart products, many shipowners and operators have yet to make a transition from paper charts to electronic navigation and will probably not do so before the mandate kicks in.

These players are heading for a technology adoption cliff where crew training is the key stumbling block. There are many reasons for playing wait-and-see, but uncertainty regarding what is actually required during the transition period certainly plays a part. One common impression is that the ECDIS goalposts are liable to shift, and that this is causing shipowners to shy away from implementation. Among the many questions to be answered — which ECDIS to choose; which backup to choose; what does the flag state require; what will Port State Control look for in an inspection — training is a point of particular confusion. This is borne out by experience in the ECDIS seminars that Jeppesen has held around the world, where around 90% of the questions aired concern training issues.

The ECDIS mandate is stretched out over quite a period of time, but one thing is certain; training cannot wait. We know from talking to many shipping companies that the transition from paper to electronic charts can be quite a long and complicated process. One major company we deal with told us that the transition on their vessels took them a minimum of six months given the procedural changes and training requirements.

By training bridge crews to use ENCs as early as possible – backed up by paper charts – you are paving the way for a smooth transition to full ECDIS and avoiding the training bottleneck that will occur when the mandate comes into effect.

You can make a rational transition from paper charts to full ECDIS, which allows crews to do effective on-ship training — as long as your ENC supplier has the range of products necessary to support this. ENC navigation backed by paper charts will make seafarers more comfortable with digital navigation. Then, when the time comes to implement ECDIS, they will have adopted good procedures and be able to navigate safely and with confidence.

With regard to ensuring that crew get quality training, both generic and type-specific, we recommend choosing an ECDIS that is supported by the major training centers and also has CBT training for the type-specific part of the requirements.

About the Author

Paul Elgar is responsible for Jeppesen's relationships with OEMs, and strives to get the optimal hardware and software functionality to customers. He has 30 years of experience in the IT and maritime industries.

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Culture of Complacency

About the Author
Dennis L. Bryant, Maritime Regulatory Consulting, Gainesville, FL, Tel: 352-692-5493
Email: dennis.l.bryant@gmail.com

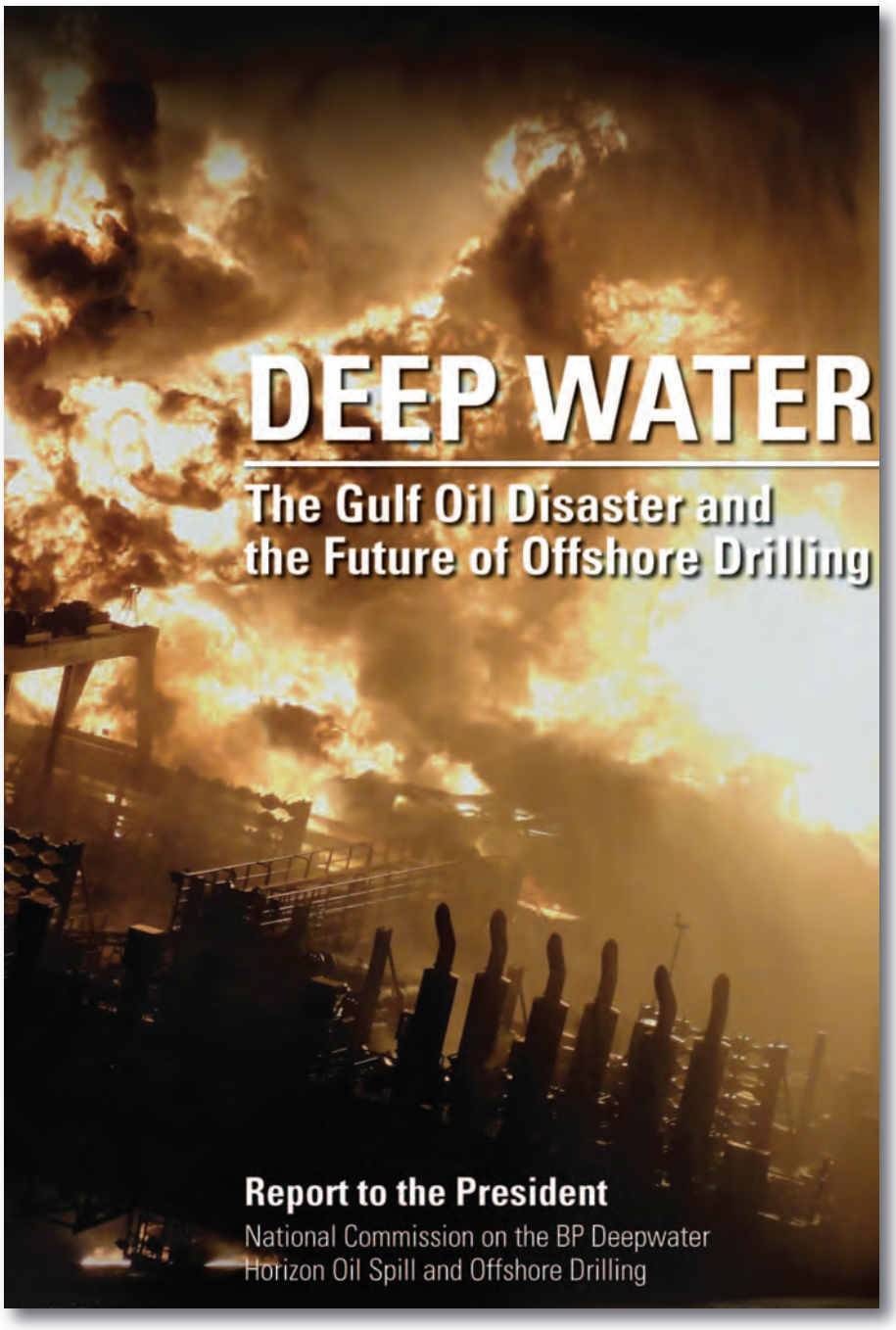
The dictionary defines "complacency" as tranquil pleasure or self-satisfaction, especially when uncritical or unwarranted. Groups are prone to complacency when events occur as expected over an extended period of time. They let their guard down, assuming that events will continue to turn out as they have in the recent past. It is one of the most important jobs of leaders and managers to prevent their groups from falling into a culture of complacency. Otherwise, the group will be set up for failure, perhaps catastrophic.

SUCCESS BREEDS COMPLACENCY

Offshore oil and gas exploration and exploitation is a highly complex and sophisticated technology. It is also fraught with danger. If not done right, all the time, people can be injured or killed, property damage can be immense, and ecological degradation can be extensive.

The Deepwater Horizon explosion and sinking (along with the associated Macondo oil spill) is one of the most recent examples of how badly things can go wrong when individuals and groups become complacent. The two space shuttle casualties are other examples. The loss of the Challenger and its seven crew members in 1986 was due in large part to the disregard by a launch officer of the risks related to the impact of freezing weather on vital O-rings in the fuel system. The 2003 loss of the Columbia and its seven crew members was due in large part to the disregard by senior personnel of warnings that insulation from the fuel tanks had impacted the shuttle during launch and might have damaged the craft's integrity. There were a number of warnings and anomalies during the drilling of the Macondo well that risks were increasing. These went unheeded by those involved aboard the mobile offshore drilling unit, ashore, and within the government.

The Deepwater Horizon casualty, loss of life, and the unprecedented oil spill led to multiple investigations. Some looked at narrow sectors, such as cementing. The Joint US Coast Guard/Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) Investigation carefully examined both the maritime aspects of the incident and the oil and gas exploration aspects. The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, commissioned by President Barack Obama and chaired jointly by Bob Graham and William Reilly, took a more holist approach.



Despite the dangers inherent in taking things out of context (and because the full report of the Commission covers 380 pages), I will attempt to quote from and highlight various provisions of that report.

Though it is tempting to single out one crucial misstep or point to one bad actor as the cause of the Deepwater Horizon explosion, any such explanation provides a dangerously incomplete picture of what happened – encouraging the very kind of complacency that led to the accident in the first place.

Absent major crises and given the remarkable financial returns available from deepwater reserves, the business culture succumbed to a false sense of security. The Deepwater Horizon disaster exhibits the costs of a culture of complacency.

But that complacency affected government as well as industry.

It should come as no surprise under such circumstances that a culture of complacency with regard to NEPA [the National Environmental Policy Act] developed within MMS [the Minerals Management Service], notwithstanding the best intentions of many MMS environmental scientists.

Moreover, increased citizen involvement before a spill occurs could create better mechanisms to utilize local citizens in response efforts, provide an additional layer of review to prevent industry and government complacency, and increase public trust in response operations.

The changes necessary will be transformative in their depth and breadth, requiring an unbending commitment to safety by government and industry to displace a culture of complacency.

PIPER ALPHA EXPLOSION & FIRE

For those who might contend that this casualty was an isolated event in an industry that is otherwise good at risk management, I would point to two other incidents. In July 1988, the offshore oil platform Piper Alpha in the North Sea suffered a catastrophic explosion and fire. Of the 226 workers on board at the time, only 61 survived. The UK Government convened an inquiry, chaired by Lord Cullen. Twenty years after the casualty, Stephen McGinty authored a book entitled "Fire in the Night: The Piper Alpha Disaster". Summarizing Lord Cullen's inquiry, Mr. McGinty wrote:

The report was damning, in effect an indictment of a culture of complacency at Occidental where the monitoring of work was inadequate in an environment where mistakes proved lethal. The permit-to-work system was 'knowingly and flagrantly disregarded', relying on 'informal communication' between personnel instead of strict observance of proper procedure. Lord Cullen also found there was 'no formal training in the permit-to-work system'. Occidental left the responsibility for training workers to their contractors. The permit-to-work system was supposed to be monitored and audited, but this had not been done in the twelve months prior to the disaster.

Occidental's assessment of risk was considered unsatisfactory, while the abil-

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ity of management to review and monitor safety procedures was lacking. They failed to perceive how changes in equipment and activities had serious safety implications. The decision to maintain oil and gas production during a massive period of ongoing construction and crucial maintenance work was described by Lord Cullen as 'puzzling'.

MONTARA BLOWOUT

Similar failures in training, oversight, continuity, and regulation were found by the Australian Commission of Inquiry established following the 21 August 2009 blowout at the Montara Wellhead Platform in the Timor Sea. Observed anomalies during the well-drilling operation were not examined to determine their cause. On-coming personnel were insufficiently briefed during hitch changes. Safety protocols were ignored because there had not been any recent casualties. Fortunately, this blowout, which lasted for ten weeks, did not include an explosion and no lives were lost. But, an estimated 1.2 to 9 million gallons of crude oil spilled into the sea, affecting an area as large as 2,300 square miles. As the Commission's Report noted, the knowledge and the means with which to accomplish the drilling operation in a safe manner was readily available, but was not utilized in this instance.

SUMMARY

I am not contending that another major casualty within the offshore oil and gas industry is inevitable. I am saying, though, that the activity is highly complex. It relies on constant attention to detail and has various redundancies built into the system. Those redundancies have proven quite successful in preventing casualties when one or even two safeguards fail. The problem is that, after years of success, people start relying too heavily on those redundancies to allow the use of shortcuts or the disregard of standard procedures. When that occurs, the redundancies can be quickly eroded to the point where risks become unacceptably high. The US Navy developed the "SAFESUB" system to guard against that very hazard due to the complex nature of its operations and the long history (though not unblemished) of safety. The system constitutes a special effort on the part of the Navy's nuclear submarine program to guard against complacency. The commercial nuclear power industry and the Nuclear Regulatory Commission have implemented a similar program. As the Presidential Commission noted in its report: "The risk-management challenges presented by nuclear power are in some respects analogous to those presented by deepwater drilling: the dependence on highly sophisticated and complex technologies, the low probability/catastrophic consequences nature of the risks generated, and the related tendency for a culture of complacency to develop over time in the absence of major accidents." The programs of both the Navy's submarine fleet and the nuclear power industry have been quite successful to date in combating the hazards presented by complacency. It is incumbent upon the offshore oil and gas industry and its regulators to not only take the steps necessary to prevent another Deepwater Horizon casualty, but to adopt wholeheartedly a safety culture that will root out complacency. We are smart enough to develop technologies and processes that will significantly reduce risk. Only time will tell if we are smart enough to overcome the human fallacy of complacency in the face of those risks.

Hickman Rowland,
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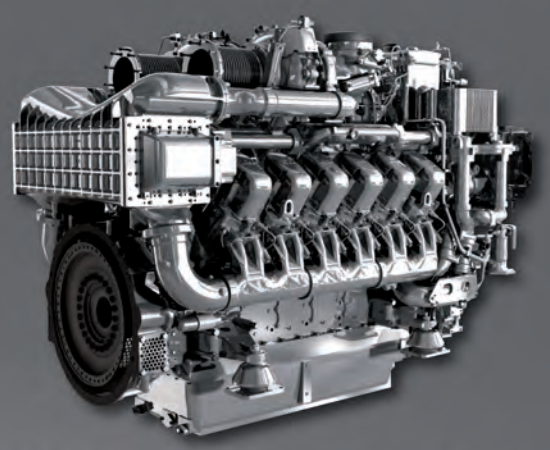

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About the Author
Ray Martino is President, Travelers Ocean Marine

In a year where globally we are seeing more natural disasters, including earthquakes in New Zealand and Chile, floods in Australia, and a tsunami in Japan, an important question for businesses relying on goods and services from suppliers in countries across the world arises: how do we prepare ourselves and our businesses for the next potential catastrophe? The events of this year serve as a reminder that a business can face the unexpected at any time, whether it is a widespread disaster that affects thousands of people or a single local incident that makes normal operations impossible.

By working closely with your insurance agent ahead of time, you can make sure you have the proper coverage, a strong contingency plan, and a good understanding of what to do if you suffer a loss.

THE RIGHT PROTECTION

Every business is different, and the coverage that will best protect a specific company can be tailored by an agent who knows your risks and exposures. Look beyond the policy itself, however, to understand if you are choosing your protection wisely. Will the carrier be there for you when you need to rely on your insurance?

Think of it in terms of capacity. First, will the carrier have the financial capacity to cover losses, especially if a natural disaster is widespread and involves heavy damages? Ratings agencies can tell you if an insurer has healthy reserves, but also look at the insurer's track record. Longevity in providing coverage to an industry usually means an insurer has been through a number of up-and-down cycles and has demonstrated staying power.

Second, does the insurer have the capacity to handle claims quickly and efficiently when there is a catastrophic event such as an earthquake or hurricane? In order to avoid delays caused by lack of familiarity with maritime conditions and legal requirements, consider an insurer with claims professionals who specialize in ocean marine policies. Also, you may want to know that staffing is adequate to handle a large number of claims without bogging down and delaying payments.

Third, is the insurer capable of keeping pace as your business needs change? Some insurers only handle some types of ocean marine business or certain size businesses. If you establish a relationship with a carrier that caters to many segments of the industry across a broad range of business sizes, you will not have to start over when your business goes in a new direction or grows larger.

PLANNING AHEAD

Enterprise risk management, business continuity preparation, disaster recovery planning – these are high-profile topics in countless journal articles, webinars and conference workshops. The challenge is to make plans that will hold up when a disaster is widespread enough to require that you have a backup plan for your contingency plan.

For example, you may plan to purchase a generator if power is knocked out to your business for more than eight hours. That plan may be impossible to implement, however, if a regional outage has led to a run on generators and you are unable to buy one. Or if you plan to subcontract work to a specific vendor to meet your contractual obligations if your own operations are down, your expectations may come to nothing if the subcontractor has also been temporarily put out of business by the same disaster.

Your insurance agent can help you find resources and templates for emergency plans that can be customized to fit your business needs. Among the things you will want to address are:

- **Business survival** – If your income is interrupted or your supply chain can no longer deliver materials because of a disaster elsewhere, how long can your business survive? Business continuity coverage may be a wise investment.
- **Backup contractors** – Will you be able to meet your contractual obligations to customers if your business is unable to operate or if equipment is damaged or destroyed? Making production arrangements with appropriate subcontractors and determining potential sources for leasing replacement equipment, both locally and outside of the area, to handle your workload temporarily is a job best done when you are not under the pressure of a disaster or some other type of substantial loss.
- **Records protection** – If your business site is destroyed, will your records also be gone? The lack of information and documentation may slow the processing of legitimate claims and require you to divert time and resources to reconstructing records. Instead, make sure your important paper records are duplicated and your digital files are backed up in a secure repository offsite.
- **Emergency information** – In the event of an emergency, who should be called and what actions will they be responsible for? How will employees be notified about the operational status of your business? What is the process for filing an insurance claim (who do you call and what information is needed)? By gathering this information in one spot, you will save time and avoid confusion should a loss occur.

If a disaster strikes, the emergency plan you have created with the help of your insurance agent and insurer can guide your business through the aftermath. Your agent can also give you tips, such as the importance of reporting a loss as soon as possible so that the claims process can begin. Even a simple step like taking multiple pictures of damaged property with a digital camera can be enormously helpful in documenting what has happened.

Constant coverage by media can make it seem that disasters are everywhere, but those in the ocean marine industry have always known what it is to be at the mercy of nature's forces. Maritime owners and operators have long proven resilient in the face of such challenges. By carefully planning ahead and making smart choices about your contingency plans and insurance coverage, you can face the future knowing you have taken critical steps to protect your company and your property should a natural disaster impact your operations.

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Firefighting Training ... *Not Another Drill*

By Tom Guldner, President, Marine Firefighting Inc.

OK, your ship has just pulled into port and will start unloading soon. The first mate has told everyone that while shore side paperwork is being completed there will be a mandated fire drill to fulfill international requirements. A designated fire team hooks up several lengths of fire hose to a fire hose station on the main deck. You are the junior crew member so you are told to drag the nozzle with hose attached to the bow of your ship. When you arrive there water is started and you are told to aim the water stream over the side for 30-minutes. When you turn around, everyone else is returning to their normal duties. At the end of 30-minutes you close the nozzle, notify the mate to shut the fire pump, and you drain and re-pack the hose.

This scenario is repeated all over the world. What was learned? Nothing, unless you suddenly encounter a fire 30 meters off your starboard bow. (Actually the crew member does learn nozzle reaction and that the fire pump is working.) Of course there are exceptions. I have been aboard ships where safety and fire fighting are taken very seriously and meaningful drills are regularly conducted. But is that the majority or the minority?

If you are a vessel Master or if you own or manage a fleet of work boats or ships ,wouldn't it be to your advantage to have everyone aboard regularly trained, to current standards, so they will be able to successfully fight a fire aboard your ship?

If the vessels officers and management take the drills seriously so will the crew. Drills should be designed to test the knowledge of the crew as well as testing the emergency equipment that will be needed.

Also, if every drill is for a fire in the galley, your crew may not be prepared for fires occurring elsewhere aboard and they will soon become bored by the repetition. Drills should be for random areas around your vessel and thought out well enough to make them realistic.

Any equipment that would be needed during a fire should be used in the drill. Just looking in the fire locker to see if the personal protective equipment (PPE), masks, and tools are present will not let you know if they are serviceable.

Have all members of the fire party don the PPE and masks. (If you do not have the capability of re-filling the air bottles then just check to see that the bottles are full, turn the air on briefly to see that the mask functions properly, and then turn off the air tank.). Ensure that you have all clothing required. (Coat, trousers, boots, hood, helmet, and gloves.) Check flashlights (torches) to see if batteries are needed.

(Photo: USCG)

If you are a vessel Master or if you own or manage a fleet of workboats or ships, wouldn't it be to your advantage to have everyone aboard regularly trained — to current standards — so they will be able to successfully fight a fire aboard your ship?

(Photo: U.S. Navy)

Other equipment, if available, should be tested at each drill also. De-watering pumps, auxiliary fire pumps, smoke ejectors and fans, portable generators and lights, gas and O2 meters, thermal imaging cameras, fog/foam nozzles and extensions, etc. should all be operated and used at drills.

Whatever tasks that would be expected to be accomplished at a fire should be done at the drill, or if not practical such as CO2, then at least simulated. Watertight doors should be closed to create fire and water boundaries. (Rubber seals on these doors should be checked.). Communication equipment should be used and repaired or replaced if needed. Hoses should be stretched and charged to ensure serviceability. Determine if everyone is aware of their position and duties as outlined on the vessels Station Bill.

During these drills discuss alternate routes to reach the fire and also escape routes. Discuss the dangers associated within each area.

(ER-electrical, moving machinery, falls from intermediate levels or through open grates. Galley-electrical, hot oil in deep fryer, refrigerant. Confined spaces-low O2, poisonous gasses, entrapment. Cargo areas-Modified Atmospheres (MA), falls, etc)

If possible use smoke generators to add to realism. (using non-toxic smoke, of course!). Your crew will not be simply walking into a clear area and putting out a real fire, so why do it at drills? If smoke is not possible then consider covering over the lenses on the mask face piece or have firefighter reverse their hoods. In this way they will become accustomed to searching and making their way through smoke at a real fire. (Note: keep safety personnel available at all danger points to prevent injuries. Do not allow fire crews to crawl over a ledge or into moving machinery.)

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drill is to have a critique after the exercise. A critique is:

" a tool to assess firefighting, rescue, and training effectiveness, and should include tactical plans and command decisions accompanied by how well they were followed. Lessons learned from the experience should be used constructively to correct deficiencies and influence training and education."[1]

The vessel's licensed personnel have gone through some shipboard firefighting training and could lead the discussion and direct the critique to the areas where some corrections can be made. Go over any mistakes that may have been made and suggest corrective measures. Discuss alternate ways of handling the same incident. Do not use a critique as a time to place blame. Its purpose is to make corrections and possible amend existing policies and SOPs. Enlist input from the crew as to how they feel the drill could be made more interesting and/or realistic. Take notes and make changes to current SOPs to reflect anything learned during the drill. I prefer an informal critique in an area conducive to the crew relaxing and actually taking part. Consider the galley area for your critique over a pot of coffee.

Marine Firefighting Inc. is available to set up an on-going training schedule for your crews. Generally we would first conduct an evaluation drill to see what training may be required. Next we would provide the training needed to bring the crew up to current standards. We would then set up drills specifically designed for your vessel/s and run through a scenario to determine the effectiveness of the training program. Finally, we would be available for on-going training to keep your crews current with any new technology. Whether you operate ocean going ships, off-shore service vessels, harbor tugs, tow boats, ferries, or excursions vessels, don't you want your crews trained to protect themselves, your passengers, and your vessels?

About the Author

Tom Guldner is a retired 33 year veteran Lieutenant of the New York City Fire Department. Before retirement Tom spent his last nine years as Officer-in-Charge of NYC's only full time Marine Fire/Rescue boat. During that time Tom also acted as the Training Officer for the FDNY Marine Division. He held a US Coast Guard License as "Ships Master" and is a nationally certified instructor. Tom is a participating member of the Society of Naval Architects and Marine Engineers (SNAME) Fishing Vessel Operations and Safety panel and also their Small Working Vessel Operations and Safety panel. He is also a Principal Member of the NFPA Technical Committee on Merchant Vessels. His articles on Marine Firefighting have been published both nationally and internationally. In retirement Tom is the president of Marine Firefighting Inc, which is engaged in providing seminars and consulting on all areas of Marine firefighting for both mariners and land-based firefighters. Tom can be contacted via Email at MarineFires@aol.com or visit his website at www.MarineFirefighting.com

1Special Report: The After-Action Critique: Training Through Lessons Learned USFA-TR-159/April 2008

(Photo: U.S. Navy)

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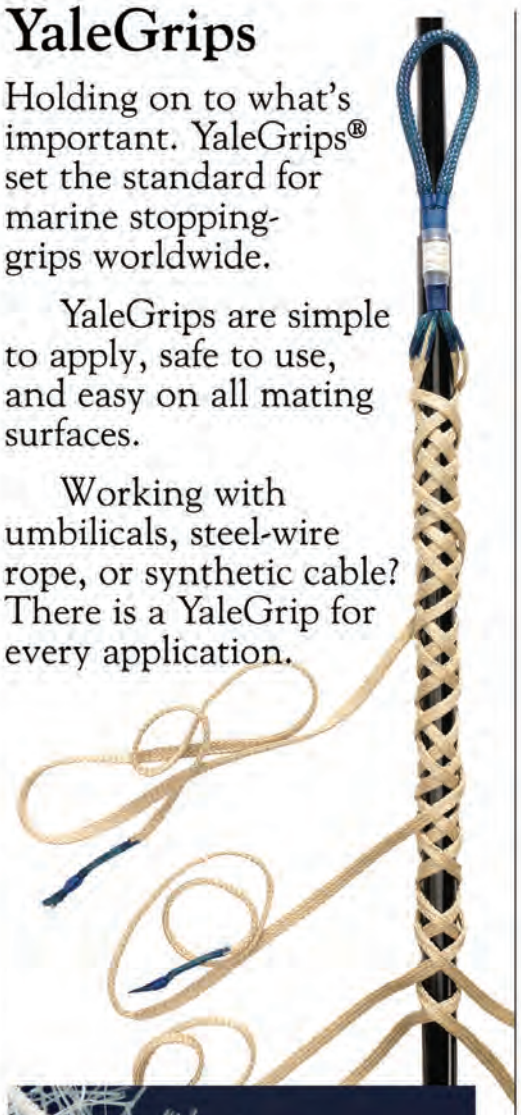

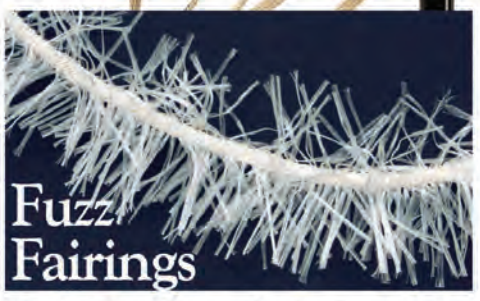

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ONR Director of Innovation: We're trying to create the alternate future

From Science Fiction to Science Fact

BY EDWARD LUNDQUIST

As Director of Innovation, Dr. Larry Schuette is one of three portfolio directors at the Office of Naval Research (ONR). His counterparts are the director of research (discovery and invention) and director of transition. The Office of Innovation promotes, fosters, and develops innovative science, technology, processes and policies that support the Department of the Navy.

"I manage the 'leap ahead' portfolio here at the Office of Naval Research," he said.

Schuette leads both technological innovation in as well as the business of innovation. "Our team manages 'quick reaction' technology and acquisition enablers to provide rapid and agile responses for critical warfighter needs," Schuette says.

That includes Innovative Naval Prototypes (INPs), which push the boundaries of our nation's technical talent to deliver transformational warfighting capabilities to the U.S. Navy and Marine Corps. [The Department of Defense (DoD) categorizes research, development, test, and evaluation (RDT&E) activities by budget authority in three categories: 6.1 is basic research; 6.2 is applied research; and 6.3 is advanced technology development. Innovative Naval Prototypes explore high 6.2 and 6.3 technologies that can dramatically change the way naval forces fight.

INPs are not programs of record, but they do reduce the acquisition risk of these new and disruptive technologies and capabilities, he says. "Some of our INP programs include the Electromagnetic Railgun (EMRG); the Free Electron Laser (FEL); Persistent Littoral Undersea Surveillance (PLUS); the Transformable Craft (T-Craft) Sea Base Enabler; and the Tactical Satellite (TACSAT) series of spacecraft."

"The SwampWorks program is part of my portfolio," he says. "SwampWorks explores innovative, high-risk and disruptive technologies and concepts, and leverages short exploratory studies to examine the maturation of a proposed technology before making substantial investments. These efforts are smaller in scope than INPs and are intended to produce results in less than three years."

Dr. Larry Schuette, Director of Innovation, ONR

As an example, Schuette says ONR previously designed unmanned surface vessels to be used as minesweepers, "so we can get away from using ships to tow mine countermeasures equipment in minefields. Taking another look we've found that the investment we've made in high-temperature superconducting degaussing equipment—to protect surface ships from magnetic influence mines—also has applications for being used remotely to detonate those mines. While high risk, the research may have significant impact."

The Innovation portfolio also involves the Massive Multiplayer Online Wargame Leveraging the Internet — or MMOWGLI — exercise, a joint effort between ONR, Naval Postgraduate School (NPS) and Institute for the Future (IFTF). This open online wargame uses crowdsourcing to get a wide range of ideas ideas and strategies that may provide insight to some of the Navy's toughest problems.

TechSolutions is a transformational business process that provides Sailors and Marines with a web-based tool for bringing technology needs to the Naval Research Enterprise for rapid response and delivery.

"One of the best ways to provide that quick reaction capability to warfighters is to hear about what they need and their ideas about solving problems from them directly," Schuette says. "Through our TechSolutions program we invite Sailors and Marines in the fleet and in the field to bring us their problems and ideas, so we can put the S&T community to work for them. It produces tangible results." (See related Tech Solutions story, pg. 38)

INNOVATIVE NAVAL PROTOTYPES

We've developed a series of satellites that pack a lot of capability into a small size, and have allowed us to prototype new concepts quickly and get them into space. We just launched TacSat-4, a small UHF communications relay satellite that allows a Marine on the ground to use a hand-held UHF radio with ranges previously unheard of. This satellite packs a lot of power into as very small space, and has one of the most advanced thermal systems ever flown. We've also developed a Virtual Mission Ops Center (VMOC) that allows for a lot of automation and flexibility for mission planning. We've learned a lot with this satellite, and we've also given the warfighter a new and much-needed capability."

The T-Craft—or Transformable Craft INP being developed by ONR is a "seabasing enabler." It had to be self deployable and deliver cargo from the sea base to shore "feet-dry," which means discharge its payload up to the beach, beyond the surf and onto dry land; and then repeat the process to continue delivering very specific cargo where needed.

Several designs have been produced for ships that can self-deploy without a payload up 2,500 nautical miles unrefueled at a speed of 20-plus knots through sea state 5.; meeting up with the sea base; taking on up to 750 tons of cargo—including vehicles as large as M1A1 tanks—in high sea states; and then deliver that payload from the sea base to shore at high speed (more than 40 knots), then discharge the payload "feet dry" over the surf and onto dry land; and then repeat the process to continue delivering very specific cargo distributed where needed, all without port facilities. The three designs show the concept is feasible.

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"The T-Craft INP demonstrator won't be built, but the technologies we've advanced in studying that concept will be available for naval architects and marine engineers for years to come," Schuette says.

LARGE DISPLACEMENT UUV

The Navy is investing heavily in unmanned systems in the air, on the surface and on the ground, as well as under the sea.

The Large displacement unmanned underwater vehicle (LDUUV) INP will be 4-feet in diameter and 20-30 feet long, with a 70-day mission profile. The LDUUV leverages the considerable experience with smaller UUVs, and bring those lessons learned into a larger, more capable platform," Schuette says. "This INP will be a complete game changer for the community."

"There are lots of missions for a UUV with that payload, volume and duration," Schuette says.

Schuette says the LDUUV is like a truck with a flexible payload section. "We provide the guidance, platform, power and energy and autonomy. Others can bring the payload."

ONR is working with universities as well as the Naval Research Laboratory, the Naval Undersea Warfare Center at Newport, RI, and the Naval Surface Warfare Center at Carderock, Md., to find new types of propulsion and fuel sources.

"We're not looking at electro-chemical energy storage. We've been looking at the hydrogen fuel cell in that General Motors has developed,, and we're are working to install it in a UUV. Ideally, we want to stay away from batteries, and find something completely new," Schuette said. "We're trying to create the alternate future. The time is right."

"We've leveraged research that goes back to the days of the Strategic Defense Initiative in electromagnetic rail guns and directed energy weapons. We're working with Navy labs and contractors to build prototypes and show Navy what the art of the possible is," says Schuette. "NRL just fired their 1,000th rail gun shot, and we've reached 33 mega joules with our rail gun at Dahlgren, a world record." "I'm excited about rail guns and free electron lasers," Schuette says. "We said what we were going to do, and we're doing it. We've taken this from science fiction to science fact."

MAINTENANCE FREE SHIP

Schuette says ONR's investments in innovation will an impact on both naval forces and the maritime industry—on and under the sea. "We're learning what we need to do to keep ships out of dry dock, and get that full ship life with less labor than we're expending now," says Schuette. "We're tying together a lot of discovery and invention work and investing in Future Naval Capabilities (FNCs) to show the Navy what this would look like on a ship."

"We've always been challenged to get full rated life out of platforms, so how can we create a ship that needs less attention, less often, and still performs at its best? How can we keep a ship out of dry dock and in service? So we're looking at the 'maintenance free ship.' I see **the tools we use for maintenance on ships today as the same as or similar to the tools we used in 40s and 50s. For example, we still use chipping hammers and needle guns for removing paint, and mitigating corrosion and rust.** We're looking at new coatings and high-solids paints that don't rust for voids

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and ballast tanks — one of the worst places for corrosion— that last for the life of the ship, or instead of requiring attention every three years, only need it every 15 years," he says.

"In terms of ship design and production, maintenance, protection, and survivability, we're trying to build things that last longer. And we're looking at new tools that have a high return on investment, that can do a better or more efficient job for a ship's crew, shipyard or contractor, because that will ultimately save the Navy money and increase our availability," he says.

Schuette says ONR is studying different materials for ship construction, such as composites and titanium. "We've always thought that titanium is too expensive, but it's stronger than steel and aluminum for its weight. It never corrodes and never needs paint. You can even recycle it at the end of its service life. Besides the very expensive aviation grade where saving weight is so important, there are other types of titanium that are not nearly as costly. So, when looking at total ownership costs, titanium might actually be the best choice. But at this point we simply don't have enough information to provide the ship designers. We want to learn everything we can about building with these materials so designers can make informed decisions."

PARTNERSHIPS ARE IMPORTANT

"We're at our best when we're working with large groups to look at problems from different perspectives," Schuette says. Schuette says collaboration with the combatant commanders and the operational commands is very important. "We work with the senior leadership in the fleet. We're talking with the flag officers and the science advisors on their staffs to find very clever solutions to their requirements, and then we work with the acquisition community to help get that new technology into the field much quicker. We're working with the Navy labs; Department of Energy labs; universities; the fleet, requirements and resource sponsors on the Chief of Naval Operations Staff, and the acquisition and test community. When you have rich and robust teams, you make tremendous progress in ways you didn't anticipate."

How does all this ultimately support warfighters? Schuette says ONR must balance the research between the warfighter of today, tomorrow, and the future. "We like to work in all three spaces. But if it doesn't support the warfighter, why do it?"

Captain Edward Lundquist, U.S. Navy (Ret.) is a principal science writer for MCR Federal LLC.

TechSolutions

Connects the S&T community with fleet, field, to solve real problems

VVBY EDWARD LUNDQUIST

"TechSolutions allows individual warfighters to submit a request and get short-turnaround solutions from the science and technology community," says Master Chief Electronics Technician Charles Ziervogel, the Command Master Chief at ONR and fleet liaison for TechSolutions.

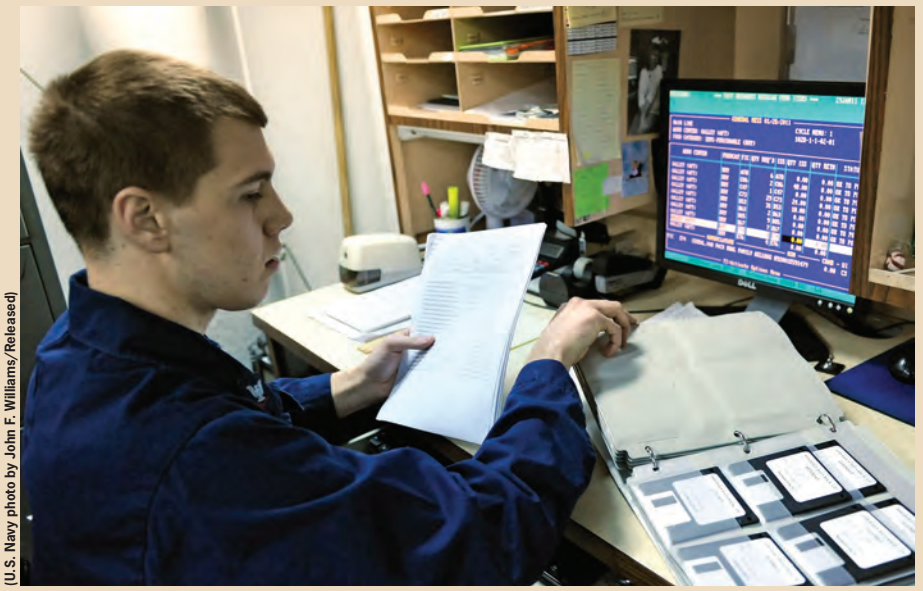
The process is simple: A Sailor or Marine contacts TechSolutions via the web or email and shares a problem or situation that needs attention. "We want to hear from the Sailor handling the lines, or the Marine toting the rifle. They know what the pressing issues are," Ziervogel says. "All we need to know is: what is the problem; what needs to be done to fix the problem; and how should we contact you?"

TechSolutions aims to provide the fleet and force with prototypes that deliver 60-80 percent solutions which address immediate needs and can be easily transitioned by the acquisition community.

In the world of acquisition, where requirements, resourcing, selection and procurement can take a decade or more, the TechSolutions process turns it all around in about a year, sometimes less. "We try put to the final product in the hands of the Sailor that made the request. Whoever generates the requirement may see direct results during his or her tour," Ziervogel says.

The idea is shared with the various research teams at ONR, covering all of the science and technology (S&T) disciplines, ONR departments, and warfare domains and enterprises. "We cross all the boundaries," he says. For example:

A Sonar Technician had a solution to the annoying buzzing hum caused by the fluorescent bunk lights in the berthing compartments. He suggested Light Emitting Diode (LED) lighting instead. In fact, it turns out that replacing all the incandescent and fluorescent lighting throughout the ship with longer-lasting LED lighting is an even better idea.



(U.S. Navy photo by John F. Williams/Released)

Culinary Specialist 3rd Class John Smith uses the existing DOS-based food service management system aboard the aircraft carrier USS Harry S. Truman (CVN 75). The Office of Naval Research and Tech Solutions funded the creation of new modernized food service management software currently being piloted on several surface ships. The new modular software design caters to each location's specific needs, provides menu planning tools, recipes and nutritional analysis, budget information and inventory tracking.

"They last longer, and use much less energy, and energy savings translates to fuel savings," says Stephanie Everett, program manager for TechSolutions.

Instead of having watch standers go out on the weather deck to take periodic observations and then send a formatted message to the Fleet Numerical Meteorological and Oceanographic Center (FNMOC) in Monterey, California, every six hours, a suggestion was made to have an automated system take constant observations day and night and submit the data to FNMOC. The Automated Shipboard Weather Observation System removes guess work about sea state, wave height and cloud cover, removes the tedious and error-prone task of writing and transmitting the message on time, and keeps Sailors out of heavy weather,

"In addition to relieving the impact on the crew, one of the goals is to improve fidelity, consistency and frequency of the observations," says Everett. "The weather prediction models will be more accurate with consistent data taken by precision instruments."

Food service records have also gone "high tech." New Food Service Management Software works with menu planning system to provide an accurate inventory of food on hand, and helps figure out what to order. "You can find out if you have enough pasta on board to serve spaghetti and meatballs three weeks later," Everett says.

FINDING THE RIGHT TOOL

When Sailors in an aviation squadron maintenance department found paper records and log books hard to maintain, which made it difficult to ensure custody and accountability of the tools, TechSolutions helped develop an automated tool room software package and barcode inventory tracking system for all tools and equipment.

TechSolutions also helped create a personal digital assistant (PDA) that helps Landing Signal Officers (LSOs) on aircraft carriers record the details of all the landings they observe—the same information that had to be hand written into the pages of a logbook—and also transmit that data online to the LSO School where it is automatically captured by a central database.

When Marines said the large custom batteries powering their EOD disposal robots were heavy, costly, and required their own specialized charger, TechSolutions developed an adapter to allow the robot to run off standard military radio batteries instead.

Responding to a request from the fleet, TechSolutions is helping catapult operators on aircraft carrier flight decks exchange their thick notebooks with hand-held devices. Instead of bulky binders with tables, charts, graphs and lists of every permutation of every configuration—from type of aircraft to relative wind speed to weapons load to fuel state to barometric pressure—with a hand-held calculator to determine the proper settings for the catapult capacity selector valve (CSV) for that particular aircraft and configuration.

Schuette says TechSolutions is looking for low hanging fruit, with a big payoff in quality of life. "We want low-cost answers, with a high return on investment."

"We're looking for that sweet spot, where we have a Sailor doing something simply because we've always had a Sailor doing it," Schuette says. "If we can find a way to have an automated process or a new device to simplify, improve or eliminate that task, then we're doing the right thing. We want to solve problems, not symptoms."

(U.S. Navy photo by John F. Williams/Released)

Shooters aboard the aircraft carrier USS Harry S. Truman (CVN 75) test a catapult capacity selector valve (CSV) calculator provided by the Office of Naval Research during flight operations. The CSV calculator is a personal digital assistant that would replace paper lookup tables and allow flight deck personnel to compute the proper settings for an aircraft carrier steam catapult. The device is being provided through the Tech Solutions program, a rapid-response technology development program that funds government laboratories to produce prototype solutions for problems identified by Sailors and Marines.

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FAST 2011 Focuses on Future of Fast Sea Transportation

BY EDWARD LUNDQUIST

Naval Architects and marine engineers from around the world gathered in Honolulu in September for the 11th International Conference on Fast Sea Transportation (FAST 2011). The four-day biannual symposium promoted world-wide cooperation among scientists and engineers involved with all aspects of the high-speed maritime industry. FAST 2011 was the Fast Foundation's 20th anniversary.

Kjell Holden of the Norwegian Univ. of Science and Technology and FAST International Standing Committee chair said the forum was aimed at stimulating development of new concepts that explore the need for higher speed for sea transportation, coastal protection and naval operations.

Holden remarked that the FAST conferences have been responsible for publishing over 1,100 papers since the first FAST forum in Norway in 1991. More than 100 papers were presented at this year's conference.

The event was sponsored by American Society of Naval Engineers, Navatek, Ltd., NUMECA USA, Inc., MARINTEK, Umoe Mandal AS, Austal Ships, the Transonic Hull Company, and the FAST Foundation.

SPEED PARADIGM CHANGE

Capt. Timothy Close, Chief of Staff for the Fourteenth Coast Guard District, was a keynote speaker. Close discussed the challenges involved in the District's responsibilities that span a large portion of the Pacific Ocean. He also addressed the challenges of high-speed craft operations.

"The Coast Guard has boats that are capable of high-speed operation to best execute various Coast Guard missions such as interdicting drug traffickers and human traffickers with high-speed boats of their own, to enable us to respond faster to Search and Rescue cases, and to respond faster to port security threats," Close said. "An important point is that while Coast Guard boats are capable of high speed, they are not always operated at high speed."

Close said the Coast Guard has several classes of boats that achieve speeds of 40 knots or greater. The speed enables the Coast Guard to better conduct drug interdiction and search and rescue missions. But there are challenges. Electronic equipment such as radars and fathometers can become problematic at higher speeds, which can affect the safe operation of the ship. "There's no room for complacency."

The Coast Guard has learned from experience that high-speed craft require a different approach to design and operation. "With traditional boats, the coxswain used to stand in the open to operate the boat. Now, we require the coxswain and crew to be seated with safety harnesses and spring-loaded cushion seats. Because of noise and wind, the boats now have enclosed sound-insulated and air conditioned cabins. These boats have human factors—to include visibil-

The Military Sealift Command joint high speed vessel USNS Spearhead (JHSV 1), the first of 10 Navy joint high-speed vessels designed for rapid intra-theater transport of troops and military equipment, prepares for its Sept. 17 christening ceremony at Austal USA in Mobile, Ala. The 338-foot-long aluminum catamarans are designed to be fast, flexible and maneuverable even in shallow waters, making them ideal for transporting troops and equipment quickly.

(U.S. Navy photo Courtesy Austal USA/Released)

ity, crew endurance, safety and comfort, and ability to carry out tasks—designed into them.

Training the crews of high-speed boats has evolved," Close said. "We need to make our crews proficient, not just qualified. Once they qualify, they need to go out and practice in all conditions, day and night, low visibility, and heavy seas.

Close said that fathometers do not work well as a navigational tool at higher speeds. Also, high-speed boats can "outrun their radar," he said. "We have come to rely on electronic navigation, but in a dynamic high-speed environment you need to look out the window as well."

High speed has brought about a culture shift in the boat operations chain of command. A new dedicated navigator position has been added to the coxswain and engineer. The entire crew is involved in a risk assessment prior to getting underway. "All the crew members have to agree on the different aspects of risk involved. It's no longer just the coxswain deciding to get underway." he said.

Commercial high-speed vessels share all the same human factors issues that the Coast Guard is concerned about with its own boats. "No matter how fast it goes, it's still a vessel, and it has to comply with all the rules of the road," Close said. "Concerns related to training, crew endurance, visibility limitations and competing waterway users for example apply to all high-speed vessels."

Dr. Tony Armstrong from Austal, based in Henderson, Western Australia, also delivered a keynote address. He discussed the trimaran hull design now being employed for fast ferries and for naval applications, as well as the benefits of all-aluminum ship construction. Armstrong shared Austal's experience with the all-aluminum Westpac Express, Hawaii Super Ferry, Benchijigua Express, Littoral Combat Ship, and the Joint High Speed Vessel (JHSV).

In addition to aluminum, the delegates heard from a number of experts who discussed the relative merits of different materials for high-speed vessels, to include steel, composites, fabric, and titanium.

TRANSFORMATIONAL CRAFT

Dr. Al Skolnick and Bob Wilson discussed the Office of Naval Research Transformable Craft Innovative Naval Prototype, better known as T-Craft, which can self-deploy without a payload up to 2,500 nautical miles unrefueled at a speed of 20+ knots through sea state 5; meet up with a sea base; embark up to 750 tons of cargo, including vehicles as large as M1A1 tanks, in high sea states; and then deliver that payload to the shore at high speed (more than 40 knots). Three different T-Craft concepts have been developed. The three competing design efforts were led by two American companies (Alion Science and Technology, and Textron Marine Systems) and one Norwegian company (Umoe Mandal).

"While long legs and high speed were viewed as doable, transferring cargo at sea and delivering it to the beach feet dry was a bigger challenge," Wilson said.

"The Navy asked industry, 'Can you do this.' The response was, 'Yes, this is achievable.' There are technologies and systems engineering developments that are needed, but this is a doable thing," said Wilson. "It could be built today."

T-Craft merges three unique ship concepts—the catamaran, surface effect ship and air cushion vehicle—to deliver long range, high speed, large payloads and the ability to go up onto the beach "feet dry" and offload cargo.

Furthermore, the T-Craft designs can transfer cargo to and from larger ships located at a "sea base" far from shore.

While a T-Craft demonstrator is not being built, the different technologies being studied will benefit from the program. A number of the presentations reported on findings from research that was associated with ONR's T-Craft program.

WAVE-PIERCING BOWS TO STERN FLAPS

Other topics presented at the conference ranged from computational fluid dynamics and structural design to hydrodynamic testing and optimization to inflatable boats.

New concept ships were explored, such as the Wave Adaptive Vessel - Modular (WAM-V), –high-speed Small Waterplane Area Twin Hull (SWATH) vessels, High-Speed Trimaran Trailerships (HSTT) for coastwise shipping, wave-piecing bows, Transonic's slender trian-gular waterplane, Surface Effect Ships (SES) and Air Cushion Vehicles (ACV), as well as ONR's T-Craft. Presentations looked at both old and new materials; variations of propulsion systems, to include diesels and gas turbines, air screws, waterjets, Z-drives and thrusters, high-speed high-frequency generators and motors, and integrated electric drive systems; as well as computerized design and simulation tools.

Subjects also included new methods of loading and discharging cargo, manning, and environmental considerations.

Dominic Cusanelli with the Naval Surface Warfare Center at Carderock, Md., presented on the design and installation of stern flaps on U.S. Navy amphibious ships which have enabled these ships to achieve lower fuel consumption, achieve better range, and increase maximum speed. The $1 million stern flaps pay for themselves in the first year in fuel savings, Cusanelli said.

Bob Wilson said FAST 2011 was an opportunity for academics, designers and builders to meet and share ideas. Wilson said it was valuable to find out about the research being conducted around the world, and to offer feedback and suggestions without being critical. "Everyone shares the same broad vision, but we all offer a unique perspective. There are a lot of free thinkers here."

Wilson noted the wealth of experience in attendance, but was also encouraged by the large number of young people at FAST 2011, especially those presenting papers on their academic research.

Dr. Steven Zalek, a naval architect and research scientist at the University of Michigan, said FAST 2011 was an excellent opportunity to personally meet many people whom he has known by professional reputation. "Now I can reach out to them because I've come to know them. This will improve my ability to do my research, and we can collaborate better and help each other in the future."

"I have been delighted with the quality and depth of the papers and presentations," said Todd Peltzer of Navatek, the FAST 2011 conference organizing committee chairman. "The variety of the topics was exceptional, ranging from the esoteric to the practical to the curious."

For example, to build faster ships in the future, it is necessary to understand what has been successful in the past. Per Werenskiold of MARINTEK in Trondheim, Norway presented on the "most successful high-speed ships for their time," a paper that discussed the design and construction of the famous Viking longships that were the scourge of northern Europe in their day.

Keel Laid for future USS Milwaukee

Workers at the Marinette Marine Corp. shipyard in Marinette, Wis. authenticated the keel for LCS 5, the future USS Milwaukee, during a short ceremony Oct. 27, recognizing the beginning of the ship's construction.

"Starting construction on the fifth ship of the class is a significant step in the life of the program," said Rear Adm. Jim Murdoch, program executive officer for Littoral Combat Ships. "We've learned a number of key lessons from the construction of LCS 1 and 3 which will improve production of these vital fleet assets. We're committed to controlling shipbuilding costs and delivering these ships on time and within budget."

LCS is a new breed of U.S. Navy warship, capable of open-ocean operation but optimized for littoral, or coastal, missions. The Navy remains committed to a 55 ship LCS program and is leveraging competition, fixed-price contracting and serial production to reduce construction duration and costs.

Milwaukee is expected to deliver to the fleet in 2014. The ship will join USS Freedom (LCS 1), commissioned in 2008; USS Independence (LCS 2), commissioned in 2009, and the future USS Fort Worth and USS Coronado, both under construction.

USS Milwaukee, named in honor of the Wisconsin city of Milwaukee, will be 417 feet in length and capable of reaching speeds in excess of 40 knots.

PEO LCS, an affiliated Program Executive Office of Naval Sea Systems Command, provides a single Program Executive responsible for acquiring and sustaining mission capabilities of the Littoral Combat Ship class, beginning with procurement, and ending with fleet employment and sustainment. The combined capability of LCS and LCS mission systems is designed to dominate the littoral battle space and provide U. S. forces with assured access to coastal areas.

Source: PEO LCS Public Affairs

(Lockheed Martin photos)

(Lockheed Martin photos)

(Lockheed Martin photos)

LCS Lessons Learned Lead to Improvements in Follow-on Ships

BY EDWARD LUNDQUIST

The U.S. Navy and its shipbuilding partners have incorporated lessons learned from the first two Littoral Combat Ships (LCS) in the design and construction of the follow-on ships.

"I think the lead ships are pretty good," says Rear Adm. Jim Murdoch, the Program Executive Officer for LCS (PEO LCS). "I think LCS 3 and 4 will be better."

LCS 1 is the USS Freedom, built at Marinette Marine in Wisconsin by a team led by Lockheed Martin, and commissioned in November of 2008. The ship deployed to U.S. Naval Forces Southern Command as well as participated in the RIMPAC fleet exercises around Hawaii in 2010. Freedom is currently in a scheduled maintenance period in San Diego. Commissioned in 2010, USS independence (LCS 2) was built at Austal USA in Mobile, Ala., and recently called at Naval Station Newport in Rhode Island for the 20th International Seapower Symposium. Independence is conducting tests at sea with both the Remote Minehunting Vehicle and MH-60S Seahawk helicopter using the AQS-20 sonar in simulated minefields. Several ships of each design are under construction at the two builders' shipyards. Fort Worth (LCS 3) completed builder 's sea trials in Lake Michigan on Oct. 24., and is due to be commissioned next year. Coronado (LCS 4) will launch next month at Mobile. Milwaukee (LCS 5) is under construction at Marinette, and construction of Jackson (LCS 6) has begun in Mobile.

Murdoch said that criticism regarding the cost overruns of the first two ships was well founded. But thanks to a robust competition, the follow on ships will cost much less. "We have two great contracts in place to provide ships at a very affordable price, and maintain a stable design," Murdoch says.

FOCUSED MISSION COMBATANT

The Littoral Combat Ship (LCS) is new kind of combatant designed to operate in the littoral—or coastal—waters of the world, to address the serious threats of mines, quiet diesel submarines and small, fast armed boats that can deny access to these waters.

LCS is the first ship built to address these focused missions of mine countermeasures (MCM), anti-submarine warfare (ASW), and surface warfare (SUW), and can be configured for those missions by changing modularized mission packages. The ship itself has ample internal volume to carry mission packages to address one of the three focused missions, and these mission packages can be quickly changed to give the ship an entirely different combat capability depending on the specific threat being addressed. These mission packages come in containerized modules which carry offboard vehicles and sensors. Employment of off-board manned and unmanned vehicles at a distance from the ship allows the Navy to rapidly engage threats while the ship stays at stand-off ranges. The Navy had planned to select just one of the two competing variants to be the Navy's choice for LCS. But in a surprise announcement last December, Lockheed Martin Corp. and Austal USA each received a fixed-price incentive contract for the design and construction of a 10 ship block-buy, for a total of 20 littoral combat ships from fiscal 2010 through fiscal 2015. The average ship target-price across the entire dual-block buy for the Lockheed Martin LCS variant is $362 million; and the average ship target-price for the Austal USA LCS variant is $352 million, according to Navy officials.

CORRECTING DEFICIENCIES

The Marinette ship had some reserve buoyancy issues, structural cracks, corrosion problems in the vicinity of the water jet tunnels, and water was coming through the anchor hawse pipe in heavy seas. To provide additional buoyancy on LCS 1, buoyancy tanks were attached on the stern on each side of the stern door. In LCS 3, the hull was lengthened below the water line providing more buoyancy without the tanks, and space for an additional 10 percent fuel capacity. With the extra length, the ship is actually faster.

LCS 1 has a "clean focsle," Murdoch says. The anchor windlass, used to raise and lower the anchor, usually found on the main deck of most combatants, is actually inside the ship on LCS 1. But water came into the ship in heavy seas. By having the opening on the deck, any water coming through the hawse flows overboard. "The new design will allow the ship to go faster in high seas."

"With that longer underwater hull, the ship is a little more efficient," says Murdoch. "Just operating on the diesel engine alone, she's about a knot faster. We're probably one to two knots faster on the gas turbine (engines) alone than Freedom was."

The LCS 1 design will have a more robust shaft seal system and improvements to the stern door leading from the waterborne mission zone top the sea so as to reduce the impact of salt water corrosion, as well as larger bridge windows.

LCS 1 has a 5-meter ridged hull inflatable boat (RHIB) as a lifeboat, mounted on the port side. "We want a larger boat. A design change is in the works."

Design improvements will permit heavier loads to be carried on the LCS 1 stern ramp. This way the 11-meter RHIB can remain on the ramp between evolutions instead of being stowed and unstowed each time, a time-consuming task.

"These are small ships with a lot of propulsion plant in them," Murdoch says.

However, Murdoch says care is being taken not to make structural changes that increase weight. "Either you want a ship that goes 40 knots or you don't."

Murdoch said LCS 2 construction required too many labor hours. The Austal ships now feature a more modular and economic construction process. Large blocks of the ship are built with all the installed piping and wiring, and are mostly complete and tested when fitted to the other parts of the ship. In addition, the LCS 4 centerline waterjets are larger so as to take full advantage of the General Electric LM2500 gas turbines.

The Austal ship has also experienced corrosion problems. Both designs need more cathodic protection, he says. The Navy and the builders are installing both additional sacrificial anodes known as zincs and an impressed current system,

"An Impressed Current Cathodic Protection System (ICCP) will be installed in both the cone assemblies and the water jet tunnels on Austal variant ships to reduce the effects of galvanic corrosion," says Naval Sea Systems Command spokesman Chris Johnson. "The General Dynamics and Austal USA approach to prevent corrosion on LCS 2 was based on commercial practices and included a coating system on the exposed metal, electrical insulation of dissimilar metals and cathodic protection via sacrificial zinc anodes in the water jet tunnels. This design proved to be less effective than intended due to multiple factors including improper electrical insulation during installation. To provide more comprehensive protection, an ICCP system and additional sacrificial protection design is being finalized and will be implemented on LCS 2 during its Post Shakedown Availability (PSA); has already been installed on LCS 4; and will be included on LCS 6 and follow as a baseline change prior to the start of construction."

With the changes, Murdoch says both production lines should now be quite stable. The key to keeping costs down, he says, is avoiding changes. "We don't introduce any changes we don't absolutely have to," he says.

Foss Maritime

A West Coast Icon on the Cutting Edge

By Raina O. Clark

Foss Maritime's purpose-built hybrid harbor tug, Carolyn Dorothy.
(Photos courtesy Foss Maritime)

Foss Maritime, founded by the matriarch of the Foss family in 1889, is as much a cultural icon on the U.S. West Coast as McAllister or Moran are on the East Coast. Norwegian immigrant Thea Foss began the business when she bought her first row boat in Tacoma, Wash. and painted it the signature green and white. The Foss family grew the business into a launch service ferrying crew and supplies in the 1910s, then shifted into towing work in the 1940s.

Thea Foss is considered the inspiration for Tug Boat Annie, a series of fictional stories by Norman Reilly Raine published in the Saturday Evening Post. The company's own tug, the Arthur Foss, starred in Tug Boat Annie, the motion picture, in 1933. Schools and waterways in the Seattle/Tacoma area have been named after the Foss family, honoring the impact the business has had on the broader community.

Both Foss family members and vessels played a role in the Second World War, including Henry Foss, a Navy Captain and son to Thea Foss. Henry's son, Drew Foss was a crew member aboard the tug Justine Foss which was sent to work in the Hawaiian Islands during the war. Drew Foss became a prisoner of war after the tug was taken by the Japanese following the bombing of Pearl Harbor and the capture of Wake Island.

In 1969 the family business was sold to a parent company, but Foss family members remained involved in the company leadership until several years ago. In 1987 Foss was again sold, this time to Saltchuk Resources, Inc., which remains Foss' holding company today. Throughout, Foss has maintained its original green and white colors and the philosophy of innovation that has kept it one step ahead of the market for the last 122 years.

Foss Maritime's current President and CEO, Gary Faber, is a graduate of the U.S. Merchant Marine Academy at Kings Point, N.Y. "It was one thing for the company to remain focused on its values while the members of the Foss family were running the company," he said. "Now, when there are no Foss family members involved in the company, it takes a special commitment from the entire leadership team and each of our employees to keep the company's focus on people and the community, and on providing responsive 'always ready' service."

No where is Foss Maritime's innovative spirit and commitment to community more apparent then in its environmental initiatives, including it's hybrid harbor craft program, its early switch to ultra-low sulfur diesel fuel and its business-wide sustainability goals.

THE FOSS HYBRID APPROACH

Foss' commitment to the environment sets the company apart, Faber said. "Now and in the future, we believe the companies best positioned to compete for work will be those with the best environmental and safety records."

"I am proud of the hybrid technology we have developed and the fact that we are now in the final stages of developing our second hybrid tug, which is a conversion of a conventional tug to hybrid power." Foss' second hybrid, the Campbell, is undergoing a hybrid retrofit at the company's Rainier Shipyard in Rainier, Ore. The Campbell is headed for the Port of Los Angeles/Long Beach, where the first Foss hybrid harbor tug, the Carolyn Dorothy, is also home-ported.

The Carolyn Dorothy is a Dolphin class tug and was built as a hybrid "out of the box," Faber said. As the pilot hybrid, she was built from scratch, but Foss has nine other conventional Dolphin class tugs, in-

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(Photos courtesy Foss Maritime)

Left
Susan Hayman, Foss Vice President, Environmental and Governmental Affairs, with one of the Campbell Foss' new generators.

Right:
"Now and in the future, we believe the companies best positioned to compete for work will be those with the best environmental and safety records," said Foss President and CEO, Gary Faber

(Photos courtesy Foss Maritime)

cluding the Campbell. These are all planned to be retrofitted as hybrids.

Foss is currently going through EPA certification for the Carolyn Dorothy. Having the conventional sister tugs has helped compare apples to apples, as far as the true fuel and emissions reductions realized, Faber said. "We've met or exceeded the original estimates for emissions reductions and fuel savings on the Carolyn Dorothy," he confirmed. Operational results from the pilot hybrid show that the main diesel engines have been used just 1% of the time and the generator engines are used 65 to 85% of the time. Faber said the entire Dolphin class should be retrofitted in five to seven years, "unless demand changes," in which case "we could do it in three years." Retrofitting one vessel takes about two months, depending on how it fits in with other projects going on in the yard. "We look at what every craft does and match the hybrid system to those requirements," he said. "We know exactly what the duty cycle is, the frequency she spends at what band of power. We work backwards and come up with the right sized generator which drives the propulsion unit in hybrid mode."

There are three components of the hybrid system: the main engines, the generator engines and the batteries. Having been built from scratch, the Carolyn Dorothy was designed with smaller engines, but the retrofitted tugs will be keeping their larger engines. "The real challenge on the retrofits is finding the extra space for the generator engines and batteries," Faber said.

OTHER TECHNOLOGICAL ALTERNATIVES?

"Hybrid technology lends itself to harbor craft with the intermittent cycles," Faber said. But what about other ways to reduce the carbon footprints of work boats?

Faber sees LNG for harbor craft as a "very real near-term opportunity," although Foss "went down a different path — the hybrid path. It lead us to a larger a reduction, faster."

"LNG in combination with hybrid might be the ultimate solution," especially for harbor craft. However, for towing he said, "because of the volume of fuel you would need, I don't know if it would be viable."

The intermediate solution for ocean towing continues to be new, efficient diesel engine and propulsion technology, according to Faber. "Diesel technology has improved dramatically in the last five years. It's been impressive." Smaller packages deliver the same or more thrust he pointed out, and hull efficiencies further reduce fuel consumption and emissions output. "It's a huge leap forward," and the next steps may be alternative fuels or propulsion systems.

Foss also voluntarily switched its entire fleet to ultra-low sulfur diesel in 2007, a year before the California Air Resources Board (CARB) began enforcing the ultra-low sulfur diesel fuel rule in regional waters. "Everywhere we operate, anywhere in the world we can get it, we use ultra-low sulfur diesel," Faber said.

"Early on we looked at what the effect would be on the engines," given that sulfur in fuel provides lubrication, but also creates corrosion. Up to this point, he said they've found no impact either way, even though it's still in the experimental phase and it's too soon to tell.

Ultimately, Faber said, propulsion technology has to be matched to the service the tug is in and the challenge to overcome is that tugs are often in one service today and another tomorrow. But, "over time, we hope to see this hybrid technology — and other green technologies — become industry norms rather than exceptions."

INTEGRATING SUSTAINABILITY

"We have developed milestones, some specific and some aspirational, that we believe will result in a sustainable business model and a safer, cleaner working environment." Faber said. "Environmental stewardship has been and continues to be a core value and a primary business driver. However, we have evolved beyond just environmental stewardship and decided that our vision is to reach a level of 'Zero Trace' for our business."

"Zero Trace" is an aspirational goal to leave no carbon footprint, meaning no detrimental emissions from tugs, equipment or land-based facilities, and no residual trace in landfills after a vessel has been built or decommissioned.

Foss also demonstrated its commitment to sustainability when it appointed Susan Hayman as its Vice President for Environmental and Governmental Affairs. Hayman, who spearheaded the development of the Carolyn Dorothy, is now focused 100% on the company's environmental initiatives.

"There is a big difference between being environmentally aware and being environmentally proactive," Faber said. "Companies are defined by what they repeatedly do, without having to be asked."

"We have met or exceeded the original estimates for emissions reductions and fuel savings on the Carolyn Dorothy,"

Faber said. Operational results from the pilot hybrid show that the main diesel engines have been used just 1% of the time and the generator engines are used 65 to 85% of the time. He said the entire Dolphin class should be retrofitted in 5 to 7 years, "unless demand changes," in which case "we could do it in three years."

The Campbell Foss, a conventional tug undergoing a hybrid retrofit, pictured at the dock at Foss Rainier Shipyard, Rainier, Ore.

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Ulstein Delivers Seismic RV

Ulstein delivered the seismic research vessel Oceanic Sirius to Eidesvik and CGGVeritas on October 3, 2011. Oceanic Sirius is designed and built in accordance with strict environmental standards and equipped with state-of-the-art technology for advanced seismic research operations. She is owned by a joint venture between Eidesvik and CGGVeritas.

Eidesvik is recognized for its focus on green solutions and dedication to the development of environmentally sound ships. CEO of Eidesvik, Jan Fredrik Meling, said: "We are pleased to take delivery of another vessel of ULSTEIN quality; a vessel designed and built to minimize harmful emissions to the environment while offering the best possible working environment for our seafarers. This is the third X-BOW vessel we now own and based on the performance of the first two, Viking Poseidon and Oceanic Vega, we have great expectations for the Oceanic Sirius." CGGVeritas is known as an innovative, responsible and high-end provider of geophysical technologies, services and equipment. Jean-Georges Malcor, CEO of CGGVeritas, said: "We look forward to the Oceanic Sirius matching the excellent seismic performance of her sister ship, the Oceanic Vega. She has been designed for optimum propulsion and seismic reliability to ensure minimum of operational downtime. Her outstanding qualities will make her a valuable addition to the CGGVeritas seismic fleet."

Oceanic Sirius is a powerful seismic research vessel with a dynamic towing force of 140 tons. The vessel is suited for acquisition of large 3D, 4D or high-resolution projects. The vessel´s 20 streamer winches are each capable of spooling 9 km of streamers. Carrying an ICE-C classification, the Oceanic Sirius can operate in new frontier areas.

Vessel Highlights

• Owner	Eidesvik & CGGVeritas JV
• Dynamic towing force	140 tons
• Streamers	20
• Duration at Sea	5 Years*

* Designed for engine & generator maintenance at sea, refueling is carried out by dedicated support vessels.

EFFICIENT

Oceanic Sirius is designed to stay permanently at sea with five-year docking intervals. There are enough engines and generator sets on board to conduct maintenance at sea and refuelling is carried out by dedicated support vessels. The vessel is equipped with two CP (controllable pitch) propellers in a nozzle, each driven by two frequency converter-driven electric motors. This allows smooth speed control of around five knots during seismic acquisition. Two work boats will be used for maintenance of in-water equipment.

Oceanic Sirius complies with the Clean Design demands as well as the redundant propulsion notation from DNV. The vessel's redundant propulsion system ensures that propulsion and steering remain intact after failure in parts of the system. Diesel electric propulsion reduces fuel consumption and atmospheric emissions. In addition to modern systems for sludge, garbage and sewage handling, a complete ballast water treatment system has been installed on board. The system prevents the spreading of marine organisms from one geographic area to another with the ballast water, a cause of potentially serious ecological, economical and health problems in the host environment.

Oceanic Sirius complies with the IMO code of safety for special purpose ships (SPS code) for up to 70 persons. She is a high-standard comfort class vessel with an internet cafe, a gymnasium and a sauna. There are 52 single cabins and only nine double cabins on board. The mess room, galley and the four dayrooms have large windows facing the sea to add comfort for the crew. The vessel is equipped with a helideck to facilitate an efficient crew change. The X-BOW hull line design results in lower added resistance and smoother bow immergence, leading to reduced operational disturbance and involuntary speed reduction.

MODERN

The ship's instrument room, with its ergonomically designed interior, is located at the stern with large windows facing the sea. It is placed directly above the seismic area, with a direct view of the streamer deck. A storage area above the instrument room is served by a knuckle jib crane with a capacity of 10 tons at 20 m outreach. The two offshore cranes placed on C-deck mid-ship have a capacity of 15 tons at 18 metres outreach and can be used to lift supplies on board from service vessels.

X Marks the *(Oil Clean Up)* Spot

Industrial disaster is often the impetus for innovation, and the maritime world is no exception. Last year, in the wake of one of the worst oil pollution disasters in history, the X-Prize Foundation and Wendy Schmidt stepped up to fund a $1.4m competition to find a more efficient means to clean oil.

— by Greg Trauthwein, Editor

Last month in a high-profile ceremony in New York City, the X Prize Foundation announced the winners of the $1.4 million Wendy Schmidt Oil Cleanup X Challenge. Two teams Elastec/American Marine from Illinois, the Grand Prize ($1m) winner, and the second place ($300,000) team, NOFI from Tromsø, Norway, innovated and outperformed more than 350 entry submissions from around the world, far exceeding the rigorous standards outlined in the competition. (*Note: The third-place ($100,000) prize was not awarded, as none of the other finalist teams met the baseline requirements)

The X Prize Foundation is a non-profit organization with the lofty ambition to help solve the world's engineering challenges by creating and managing large-scale, global incentivized competitions. In this competition, the Deepwater Horizon blowout and resulting oil spill in the Gulf of Mexico led the foundation and philanthropist Wendy Schmidt – who personally funded the prize purse – to create the $1.4m Wendy Schmidt Oil Cleanup X Challenge.

This competition in particular highlights not only the drive for prize money, rather the true innovation that emanates from academia, as well as the halls of corporations, large and small. In the case of team Elastec/American, taking the quantum leap from a floating, spinning utility bucket to the creation of the world's fastest and most efficient oil spill recovery system was the investment of innovative minds, a talented workforce and the lure of the X-Prize competition.

THE MISSION

The X-Prize foundation targeted oil spill clean-up technology in the wake of Deepwater Horizon, challenging entrepreneurs, engineers and scientists worldwide to develop innovative, rapidly deployable, and highly efficient methods of capturing crude oil from the ocean surface. The 10 finalist teams – each of which travelled to New York for the awards ceremony – then had to demonstrate their cleanup systems individually during field testing over a 10-week period in the summer of 2011; the teams were overseen by an panel of judges as they demonstrated their technology's ability to recover oil from the sea-water surface Ohmsett – the National Oil Spill Response Research & Renewable Energy Test Facility – in Leonardo, NJ, which is the largest outdoor saltwater wave/tow facility in North America.

The qualification to be considered for a top prize was stringent, as teams had to demonstrate an Oil Recovery Rate (ORR) above 2,500 gpm, with an Oil Recovery Efficiency (ORE) of greater than 70%. Only Elastec/American Marine and

The Winning Team

Elastec/American Marine made amazing strides in the ability to efficiently remove oil from water, devising a system that removed a staggering 4,670 gpm at 89.5% oil to water recovered efficiency.

The winning team, which included Team Leader: Don Johnson and Team Members: Donnie Wilson, Jeff Cantrell Stewart Ellis, Charles Storey & Brian Orr, is pictured left. It is also worthy to note that The Glosten Associates, Inc. also was a member of the group.

Wendy Schmidt Oil Cleanup X Challenge

Competition Results

Team	Comb MEAN ORR	Comb MEAN ORR	Calm MEAN ORR	Wave MEAN ORR	Wave MEAN ORR	Wave MEAN ORR
1 Elastec	**4670**	**89.5**	4706	88.9	4633	90.1
2. NOFI	**2712**	**83**	2958	91.9	2466	74
3. Koseq	2065	87.9	2311	98.2	1818	77.6
4. OilShaver	2007	90.7	2008	92.6	2006	88.8
5. Crucial	1888	71.3	2149	79.7	1626	62.8
6. Lamor	1413	92.5	1362	91.4	1465	93.6
7. Vor-Tek	2269	57.3	3014	72.1	1525	42.5
8. OilWhale	1021	42.8	1557	44.6	485	41
9. PPR	962	92.1	1045	96.9	878	87.3
10. Voraxial	693	49.2	941	63.9	445	34.5

NOFI were able to exceed both goals, with Elastec/American creating a system that exhibited a staggering Oil Recovery Rate (ORR) of 4,670 gpm, with an efficient of 89.5% oil to water recovered; and NOFI exhibiting an average ORR of 2712 gpm with an average ORE of 83%

THE WINNERS

Elastec/American Marine, a manufacturer of oil spill and environmental equipment known for innovation in machinery design, is a self-funded, privately held Midwest corporation that has grown to become one of the largest manufacturers of oil spill equipment in North America. The company, which started over 20 years ago, has grown into a 100+ workforce that has gained a global reputation for its technological innovations. In the X-Prize competition, Elastec/American Marine reached more than three times the industry's previous best oil recovery rate tested in controlled conditions.

Team leader Don Johnson is manager of the Elastec/American Marine Aluminum Boat Division, and has 30 years experience in the design and manufacture of recreation vessels. He was embedded at the Deep Water Horizon event as an onshore facilitator representing Elastec/American Marine for the In-Situ burn task force.

To know the Elastec/American Marine Team story, it is essential to start from the beginning of the company. Elastec/American was started by Donnie Wilson and Jeff Cantrell, started as any other Southern Illinois oilfield service company. From the start it was their innovation that earned them a solid reputation, as oilmen with a problem with machinery design would come to see them. "They would draw out a design on a napkin and say 'Can you build this?'" Wilson said. "We're still doing that - solving problems."

Elastec/American holds two international patents and six domestic patents on its products, and it got its start in the business of oil recovery systems after responding to a small, local oil spill. The equipment being used wasn't doing the job very well, and Wilson said he asked Cantrell to throw him a five-gallon plastic bucket to help in the recovery. Luckily Jeff's aim was off that day, and the wind caught the bucket and blew it into the spill on the water. The wind continued to turn the bucket and Wilson noticed that as the bucket turned, oil stuck to the side of it, leading them to their first invention of oil recovery equipment. So it began.

That bucket spawned the company's barrel skimmer. Never satisfied with the "norm" Wilson and Cantrell continued their pursuit to design and deliver an even more efficient skimmer apparatus, and in 1990 it obtained the first of many patents for innovation in the field of pollution control equipment.

Fast forward to April 20, 2010: the Transocean drilling rig, Deepwater Horizon, exploded. This event was immediately devastating as 11 crewmen were killed. The rig sank two days later. As information was being gathered, it was not known how much, if any, oil was being leaked into the Gulf of Mexico. By Saturday, April 24th an oil leak was reported near the sunken rig. Over the course of the coming months it became the largest oil spill in U.S. history.

Elastec/American Marine was contacted on the morning of April 26, with a request for Hydro-Fire Boom, a request that led to Wilson and Cantrell personally driving a truck loaded with equipment toward New Orleans. While all the resources and options were being gathered and assessed for managing the response, the U.S. Coast Guard announced it would conduct a test using fire resistant boom to burn the oil

floating on the water's surface. The boom they selected was Elastec/American's Hydro-Fire Boom. The test was a success and the Coast Guard then authorized controlled burning as a response tool. This is the first time that the technique of burning oil on water in a large scale incident has been proven – reducing the impact on the shoreline and sensitive ecosystem of the Gulf coast. By the time the well was capped a record 411 burns were conducted with some lasting up to 12 hours. In addition to supporting the controlled burning Elastec/American Marine supplied approximately 180 skimmers and 100 miles of containment boom to assist BP and other responders in their cleanup efforts. When it came time to devise a solution for the X-Prize Foundation Contest, the challenge was daunting. "I felt that to pick up 2,500 gallons per minute was not that difficult, but the thing that most technologies have to overcome is the ability to pump and handle that volume." said Brian Orr, Welding & Fabrication, Elastec/American.

"I knew that they (the Elastec/American team) had the capacity and the mental wherewithal, it was mainly the short amount of time we had to design and build it," said Don Johnson, Team Leader. "Picking up 2500 gpm is easy, actually, you can pick it up, it's the separating it and picking it up cleanly that is the challenge."

The resulting system was a derivation of the company's barrel skimmer. Dubbed the Disc Groove Skimmer, it utilized a series of special discs instead of a barrel, dramatically increasing the surface area for oil collection and allowing the team to increase the RPMs to meet (and as it turns out, drastically exceed) the 2,500 gpm challenge. Donnie Wilson, Co-Founder and CEO of Elastec/American, summarized: "This is the biggest oil skimmer we've ever built,"

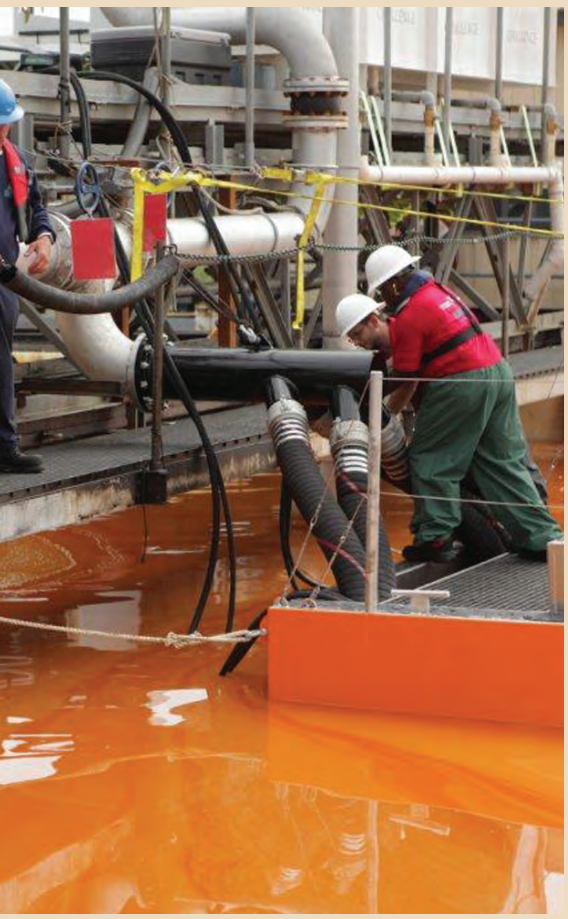
"When we started, it seemed like a really big challenge; we'd started down one path that didn't work, then we tried another path, and then we eventually came out with this Disc Groove Skimmer," said Charlie Storey, Research & Development. "Everyone like it, and it looked like a really good concept, but until we actually got it out there in the oil and tested it we really didn't know. When we put it into the oil and tested it, and we saw how much oil it really did pick up, we were

impressed, and we knew we were on to something."

Team Elastec partnered with Glosten Associates, Inc., a long-tenured and well-respected naval architecture and marine engineering firm, for the project. Glosten provided vessel engineering, mechanical system design, and operations support throughout the aggressive 45 day development process, integrating Elastec's Grooved Disk recovery technology into a sophisticated and robust recovery system. This system, a U-shaped aluminum hull outfitted with the ingenious collection and separation systems, achieved the incredible oil recovery rates. Elastec/American Marine and Glosten are currently developing this combination of collection and Grooved Disk recovery technologies into several derivative designs, including a compact, easily deployable oil-recovery package expected to be commercially available shortly.

Put to the Test

The 10 finalist teams demonstrated their cleanup systems individually during field testing over a 10-week period in the summer of 2011. The teams were overseen by an panel of judges as they demonstrated their technology's ability to recover oil from the sea-water surface Ohmsett – the National Oil Spill Response Research & Renewable Energy Test Facility – in Leonardo, NJ, which is the largest outdoor saltwater wave/tow facility in North America.



Awards Ceremony participants included Wendy Schmidt, President, Schmidt Family Foundation and Title Donor of the Wendy Schmidt Oil Cleanup X CHALLENGE; David Lawrence, Executive Vice President, Exploration and Commercial, Shell Upstream Americas; Dr. Peter H. Diamandis, CEO & Chairman, X PRIZE Foundation; Robert K. Weiss, Vice Chairman & President, X PRIZE Foundation; and Cristin Dorgelo Lindsay, Vice President, Prize Operations, X PRIZE Foundation. The $1.4 million Wendy Schmidt Oil Cleanup X CHALLENGE is the fourth competition awarded by the X PRIZE Foundation.

www.xprize.org

One-on-One With

Navpreet Singh

Dolphin Offshore Shipping & Dolphin Offshore Enterprises India

As India continues to build its maritime infrastructure and grow its global importance to the world maritime and offshore industries, Maritime Reporter's man in Mumbai meets with Navpreet Singh, managing director of Dolphin Offshore Shipping & Dolphin Offshore Enterprises India, to discuss the company's colorful past and promising future. ***— By Joseph Fonseca, Mumbai***

Navpreet Singh joined Dolphin Offshore Enterprise India Limited (DOEIL) in 1989, as Director of Finance at the age of 26. Considered a financial wizard, he soon saw the company through a phase of rapid growth. By taking DOEIL public in 1994, he helped raise capital for the acquisition of the company's first owned vessel, the Ganga Dolphin. Later, he secured additional capital for the company to invest in two new workboats and a construction barge, through the issue of Foreign Currency Convertible Bonds to Clearwater Capital. He soon took on the additional responsibility of all the company's marine operations as the company's Chief Operating Officer until a few years later when he was given charge as Managing Director of Dolphin Offshore Shipping Ltd., a wholly owned subsidiary of DOEIL. In addition Navpreet is now also the Joint Managing Director of DOEIL. In a freewheeling interview with *Maritime Reporter & Engineering News* he gives a rare insight into the offshore sector of India's oil and gas scenario.

Tell us how the Dolphin Offshore group came into being.

The company was started by my father Rear Admiral Kirpal Singh in 1979 two years after he retired from the Indian Navy. Initially he partnered with a ship repair company. But it was also a time when the shipping industry was seeing a downturn, with opportunities in ship repair business being few and far between. It was also the advent of the Indian oil and gas industry with oil having been discovered in Bombay High by the Oil and Natural Gas Corporation (ONGC) a few years earlier in 1975. Keen to get into diving services, something that was recommended to him by ONGC, my father decided on making a break into this new territory. He felt it a better option to get into a relatively new business than to operate in one where competition raged from established players. At an offshore conference he came in touch with Taylor Diving & Salvage Company Inc, a subsidiary of the U.S.-based Halliburton Group. Later he joined hands with them and established

diving operations in India. Since the ship repair company he partnered was not interested in diving activities, he sold his shares and formed Dolphin Offshore Enterprises India Ltd (DOEL) in 1979. Ten years later I joined the company in 1989, after a stint with Arthur Andersen & Co. where I served after graduating from Bombay University and become a member of the Institute of Chartered Accountants of India.

You have carved out a niche in the offshore industry where you dominate. What is Dolphin's forte that helped it achieve success in the offshore business?

It is our expertise in diving that is very essential for deep sea exploration and production activity. All of our divers are skilled saturation divers, with outstanding capabilities in different areas of operations. Human intervention is needed before any sub-sea work is carried out. For instance, before drilling starts we survey the sea bed where the rig is jacked down to ensure that the ground is even and there is no danger to either life or equipment.

Also a lot of welding and cutting that has to be done besides non-destructive testing where we actually test welds on jackets and platform, ultrasonic testing to ascertain the thickness of the weld material if there has been any wear and tear requiring replacement. We also do a fair amount of construction activity; this again is divided into various segments.

There is inspection, protection and repair work. When you are looking at setting up the drill ships or platform, diving support for installation work, stabilization and several other related activities, all of these are provided by us. We are one of the few players in the field who provide all the three dimensions of marine construction services, i.e. Marine operations, Diving / Subsea services and Topside / Fabrication services, to execute offshore projects on a turnkey basis independently.

When did you get into management, and how does it fit into your business model?

We got involved in fleet management inadvertently in 1988. In one of our contracts we had provided a Halliburton Group company's vessel to another Indian shipping company to be managed. Unfortunately this company ran into a bit of a problem and we had to take over the management of the vessel. Initially ONGC was a bit reluctant to allow us to run it, being not fully experienced (since whenever we did such a job it was on "no cure no pay" basis, that is, if they were not happy they could cancel the contract). But they were happy and also because we successfully handled a contract for a company in the Middle East we were able to qualify for the operation and management contracts of ONGC. In 1995-96 we took up contracts for providing support for two vessels from a yard in Singapore and began providing management for these two vessels.

Then from two vessels we went on to four and then six. We also did technical management for three cargo vessels for the erstwhile Scindia Steamship Navigation Company, which were used for Indo – USSR trade. But with the collapse of the USSR we had these vessels upgraded which were later sold in European markets.

What about asset owning? How many vessels does Dolphin own presently?

Yes we began asset owning in 1994 when we bought our first vessel Ganga Dol-

Vikrant Dolphin DP2 Accommodation Barge.

phin. But we still continued ship operation and management even in 2001 when we did O & M contracts on ONGC's dynamic positioning Multi Support Vessels, and managed five vessels till around 2004. We did two operations of tug and barge and we managed two mini bulk carriers for Garuda Shipping which were being operated by ISPAT. But our fleet expansion was started in earnest in 2004, when we bought our second vessel, Brahmaputra Dolphin and in 2006 we bought a company called Husain Offshore which became Dolphin Offshore Shipping. This company at the time of acquisition had six harbor tugs and one utility vessel. In a way these vessels fitted into our business model because we began using the tugs for our allied activities including towing vessels from the fabrication field inshore and also for our operations on behalf of IPCL, Gujarat Ambuja, for Kolkata port trust, etc. We also used these for oil and gas. Presently, we are down to four harbor tug vessels and have one anchor handling tug which is on bare boat demise charter, three utility vessels work boats and now we have a construction barge which has accommodation for 275 people. It has a large deck space and the capability of putting up a 450 ton crane such as is basically used for carrying out major work offshore.

Under Dolphin Shipping our total fleet is four harbor tugs, two offshore utility vessels, two work boats, one anchor handling vessel and one construction barge. If required, we take on charter the anchor handling construction barge and the work boat that are owned by our Mauritius subsidiary, Dolphin Offshore Mauritius Private Ltd.

What types of services in the Indian offshore do you offer, and how do you plan to expand?

We do a lot of revamp work, construction, fabrication, maintenance, turnkey jobs, etc. In the future we intend to carry out more of EPC type of contract where we do revamp and modification of existing infrastructure including platforms, etc. We are also getting involved in work on installation and fabrication of platforms. No doubt these fetch higher revenue and higher profits but they are also high risk ventures. Besides ONGC, we have done work for Cairn Energy, British Gas, Oil India Ltd., Hindustan Oil Exploration Company (HOEC), etc. On the East coast we have worked in the River Krishna-Godavari Basin for ONGC but not for Reliance. We worked on the Ravva project which was with ONGC earlier and again when it was taken over by Cairn Energy. We worked with the PY 1field which is with HOEC.

Do you have any plans for expanding your operations to the overseas offshore regions?

At the moment our operations have mostly been India-centric but we are getting more and more involved in the Middle East. The difference with operating overseas is that you have to be registered with all the oil companies and have access to your clients and be able to bid through them. Besides, the safety and environment norms are much higher than those that exist in India. The main issue is that it is time-consuming trying to get a foothold in those regions. We find Middle East is closer and we are confident of handling operations from here.

Which is a better option: Bombay High on the West coast of India or the Krishna Godavari basin on the East coast?

For us Bombay High is better since most of our assets are located for our activities with ONGC. On the East coast Reliance is well established in the deep water for which type of operation our assets are really not geared.

Do you feel the opportunities in the Indian offshore are better than those in the rest of the world? Is it congenial for Indian players?

The offshore industry is quite vibrant only because internationally the markets are quite slow. We see plenty of foreign companies coming in and par-

ticipating in the operations in India which to a certain extent is putting the Indian players at a disadvantage. There has been a lot of competition, prices have been tumbling in the last two years and the way tenders are structured right now is not favorable for Indian companies. The main reason is that Indian companies undertaking activities in India end up paying service tax on the entire contract which is included in the evaluation of the price bid. But foreign players are better off as they undertake all their operations outside and come to do only the installation work in India. This means that they are subjected to service tax only for that element of work.

To what extent does this affect your bids? Are there other factors preventing local players from getting a level playing field?

Recently we lost an ONGC contract by just 1 percent. Although I was cheaper than the others, but owing to the said service tax loading, we lost out to a foreign competitor. Foreign bidders turned out to be quoting much lower than us, as they load service tax only for the work they do in India.

What is also placing us at a great disadvantage is that overseas companies are deploying their surplus assets in India at prices I would put as really "dumping rates." So what happens is that the foreign companies by bidding at ridiculously low rates are eventually driving Indian companies out. In the ONGC contract I, my bid was $235m while the company that got the contract had bid at $139m. You see the prices are dropping drastically.

Since this is all under international competitive bidding, the fact is that foreign companies are presumed to be cheaper than Indian companies and hence the foreign players are not expected to get any approval from the Indian administration (viz. the Director General of Shipping) under Cabotage law. It is taken for granted that blanket permission already exists. This is because the Indian company can match the lowest price under 'The Right of First Refusal'. Since no such match is made; it is assumed that the foreign competitor's bid is acceptable. It is a very lopsided way of doing things but this is the way it is done.

Is it a different situation abroad?

In foreign countries you need to have a local national company. In Malaysia one needs to be a Bumiputra company, like Petronas, to be eligible to bid. Even in the Middle East they demand a high requirement of indigenous inputs. So also in Brazil, there is a lot of indigenization requirement. For example if you have been operating for more than six months one-third of the crew needs to be Brazilian. If it is for one year than half the crew and if it is beyond one year two-third of the crew need to be Brazilians. There is no such restriction on foreign companies operating here in India. The result has been that none of the Indian companies have won any major contract abroad. With India being one of the few vibrant markets we see a lot of foreign companies moving their resources to India because they don't have a better alternative. But once the markets begin to improve overseas, they are likely to move back because the rates will have improved there. Also the infrastructure there is more suitable to support their operations. In fact the market next year will be more congenial.

Then what makes India unique?

The Indian setting is a vibrant market. The government is not bothered about the international pricing of oil and gas but more concerned about achieving self sufficiency and energy security. Even when the international market was going through a downturn the Indian market continued to be vibrant. We feel the Indian offshore will continue to be vibrant. I expect a major oil strike happening here and it will be in the deeper waters.

Installation of Separator of ICP Project.

Brazil Workboat Market

While much of the focus in and around Brazil is rightfully centered on the burgeoning offshore oil and gas market and, in step, the resurgence of the big oceangoing ship market, the boom in business south of the equator is having a big impact on the business of building smaller coastal, offshore and inland vessels – the Workboat market. Fresh from a tour of Brazil, Alan Haig-Brown reports.

BRAZILIAN YARD WITH AMBITIONS

Fernando Santos Mata Virgen carries two business cards. Both cards show him as Director, in one case of the Corema Shipyard in Salvador Brazil, the other for Navemar Towing. Explaining that he has recently sold his fleet of tugs, the 70-year old director is conferring with naval architect Marcos de Parahyba Campos on the building, at Corema, and operating, by Navemar, of a fleet of six 32m line handling tugs for offshore support. Also on the table were the plans for a new shipyard that would move his build potential from 75 to 200 m. The ship docking tug Navemar XIV was one of the tugs that went with the Navemar fleet sale to Wilson Sons (www.wilsonsons.com.br/ingles). At the time of the sale she was nearing completion. By late August crews from Corema, Navemar and Wilson, Sons were on board working with suppliers to do the final adjustment of the tug. In the engine room, Cummins Application Engineer Aline F. Barros was working with Z-drive people to finalize the articulation of the 2200 HP at 1800 RPM Cummins QSK60-M main engines and the Z-drives. Based in Rio de Janeiro Barros is coordinating and tracking a number of marine projects for Cummins Vendas e Serviços de Motores e Geradores. She covers the states of São Paulo, Rid de Janeiro, Expirito Santo, Bahia and Sergipe. The 30.1 x 9.8-m tug has a 4.65-m molded depth. With a combined power of 4400 HP at 1800 RPM the tug has a 55-ton bollard pull. In addition to a bow mounted hawser winch, the versatile ship-docking tug is also fitted with a towing winch and a quick-release towing hook on the aft deck. Tankage includes 172 cu. m. of fuel and 28 cu. mt. of potable water. With all systems checking out the tug will be delivered to the ever growing Wilson, Sons fleet while Fernando Santos looks for partners for his new shipyard and continues with his other build projects.

MANAUS: DEEPSEA INLAND PORT

Arguably the world's greatest river system, the Amazon is navigable to large ships from the sea to Manaus. This is a distance of nearly 1000 miles, a similar distance to that from the Gulf of Mexico to Saint Louis on the Mississippi, but on that great American River deep-sea navigation ends at Baton Rouge, only about 250 miles up river. Due to ocean currents, the Amazon does not form a delta as do rivers like the Nile and Mississippi. As a result, silting in the main river channel is minimal and dredging is not required.

At Manaus the Rio Negro river joins the Rio Solimões to form the Amazon. Above Manaus the Solimões, which is also known as the main stem of the Amazon, the river continues navigable for another 1200 miles. Ships with drafts of about 18 ft. can use this upper section as far as Iquitos Peru for most of the year.

The two existing container terminals, Chibatão and Super Terminals, located next to each other on the Rio Negro, currently handle about 350,000 TEU per year. Plans are in the offing for dramatic increases in the Port's capacity. With river heights

(Haig-Brown photos courtesy of Cummins Marine)

Fernando Santos Mata Virgem (right) — Director of the Corema Shipyard in Salvador, Brazil, and Director for Navemar Towing — has plans for growth of both operations.

Left: The operator's view over the bow of Navemar XIV.

(Haig-Brown photos of Chibatão Port and José Guilherme V courtesy of Cummins Marine)

ranging up and down by about 14-m over the year all terminals are floating and connected to the land by huge ramps. On August 22, 2011 there were four ocean going ships in port with one at anchor in the river and three working cargo at the two floating container ports.

The 186-m Hong Kong registered container ship MSC Tuscany was alongside at the Chibatão pier with three of the port's six 45-ton container cranes working her cargo. A number of the port's 80 tractors were kept busy running up the bridge to the dry land storage. This was a slow day as the 431-m of pier can simultaneously handle up to four ships with draft between 12 and 20 m. To assist ships with docking and un-docking Porto Chibatão maintains a pair of Cummins-powered 3200 HP tugs. Built at the ERIN Shipyard in Manaus in 2009 and 2010, the Z-drive tugs are each powered by a pair of Cummins KTA50-M engines producing 1600 HP at 1800 RPM. In addition to the container pier, Porto Chibatão operates a ro-ro facility for barges. This services their fleet of more than 20 pushboats with one, two or three Cummins KTA19-M3 engines each. In recognition of the long standing relation with Cummins, Powertech Comercial, the Amazonas Cummins dealer, maintains a service center at the port. For a complete overview of Porto Chibatão see: www.portochibatao.com.br

WHEELS ON THE AMAZON

Lowlands that can make road building difficult border the 1,495 km of river that flow between Belém and Manaus. The roads to Manaus are long and circuitous. With the world's highest volume river flowing between the cities the movement of truck trailers typically takes place with the aid of RoRo barges. The one of the largest operators on this route is Bertolini Transport Ltda. The firm also pushes barges another 1,756 km up to Tabatinga on the Peruvian border. To meet the demands on these and a half dozen other routes, the company operates a large fleet of pushboats. This includes over 20 vessels with Cummins KTA-M3 engines each producing 600 HP at 1800 RPM. A 1200 HP towboat, powered by a pair of KTA19s will typically push a 76 x 20.9-m barges loaded with truck trailers. The down-river trip takes about four days with the return up river taking about five days. Some

Bertolini towboats and barges at Manaus.

(Haig-Brown photos courtesy of Cummins Marine)

larger towboats, such as the triple KTA19-powered M/V Bertolini LVIII, can push multiple barges on the larger river or handle shallower rivers. These larger tows often use a detachable bow thruster also powered by a Cummins KTA19. On smaller and faster waterways single barges allow transport. To see the routes served by Bertolini Transport Ltda. Please see: www1.tbl.com.br/portfolio/ingles/rotas-fluviais-mapa.html

MANAUS: A PORT ON A HILL

To a large extent Manaus owes its existence to its location at the confluence of the dark waters of the Rio Negro and the sand-colored waters of the Rio Solimões. Of equal importance is the elevated land that rises above the oft-flooded Amazonian basin. With river heights varying by as much as 14 m over the year the elevation is good but it leaves limited flat beach land for shipyards.

The shortage of low beach land hasn't stopped Francisco Barbosa Dos Santos from building steel towboats at his yard, Barbosa Reparos Navais Ltda. A visitor arriving at the yard by road might be a bit confused when the entrance is a simple door between two houses. Inside the door a small storage area leads to a precipitous drop to the river far below. A long flight of stairs parallels the metal tracks of a simple funicular on which one stands to be lowered by cable.

As the visitor descends to the yard a quick count shows a dozen boats and barges in various states of repair and completion. Barbosa builds the hulls and superstructure on the limited, and steep, space available on his marine ways then finished boats up alongside his covered barge machine shop. In late August there were two Cummins powered boats in the water. The first, with its hull and superstructure completed and covered in grey primer, awaited a single KTA19-M engine. When all done up this would be a fine looking single screw 600-HP towboat. The second boat, the Possante L, was nearing completion and Cummins Manaus representative João Mendonça was visiting the owner Jose Soares. Powered by a pair of Cummins KTA19-M mains this 18 x 6.6-m, 1200-HP boat would be fully capable of handling the larger tows on the Amazon system.

The Barbosa yard from the funicular. The grey boat on the left has a single KTA19 engine while the green roofed boat seen from the bow has twin KTA19s

João M. N. Mendonça of Powertech Comercial Ltda confers with Jose Soares of Caiambe Navegacao E Comercio Ltda. in the engine room of the new vessel.

(Haig-Brown photos courtesy of Cummins Marine)

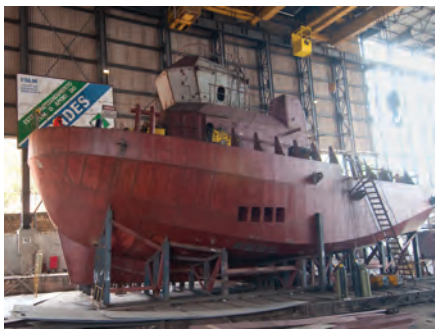
ROBERT ALLAN LTD. IN MANAUS

There are probably more Robert Allan-designed ship docking tugs under construction worldwide than any other design. So it is not surprising to see one under construction at the Estaleiros Rio Negro Ltda. (ERIN Shipyard) in Manaus, Brazil. It is undoubtedly the only Rampat 2400 being built in a yard 1000 miles from the sea. But then Manaus, like so much of contemporary Brazil demands superlatives for accuracy.

The first of three Rampart 2400 ship docking tugs under construction at the yard is showing the distinctive Robert Allan Ltd. lines. From the fine underwater taper on the stern that allows remarkable bollard pull when working a line off the bow to the well-proportioned deck and wheelhouses.

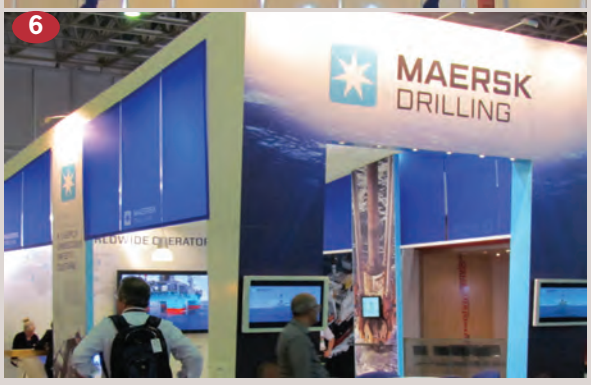
This is a profile familiar in a growing number of the world's major ports. The smaller version of the Rampart design will be handling ships loading soybean at the Itacoatiara Port for Hermosa Logistics some 260 km downriver from Manaus. While the maximum length of ship to be handled at the berth is limited to 255 meters, there is typically a four-knot current at the berth. This could all make for tricky landings, but ships are provided with an experienced mooring master for the occasion.

Each of the tugs will be powered by a pair of Tier 2, Cummins QSK38-M engines producing 1400 HP at 1800 RPM each and turning Rolls Royce US155 model azimuth drives. Once in service these boats will do much to ease a challenging docking situation.



RAL Design under construction at the Estaleiros Rio Negro Ltda. (ERIN Shipyard) in Manaus, Brazil.

(Haig-Brown photos courtesy of Cummins Marine)



FROM THE TOP:

(1) Full house at the OTC Brasil 2011.

(2) The OGX and OSX booths were most popular

(3) Hempel & (4) General Electric, participated in the inaugural event.

(5) The US Pavillion at the OTC Brasil 2011.

(6) Maersk Drilling looking at entering the Brazilian O&G market.

OTC Brasil 2011

Last month the Offshore Technology Conference (OTC) held its inaugural event in Brazil. *Maritime Reporter* correspondent Claudio Paschoa reports from Rio de Janeiro.

The Offshore Technology Conference is held annually in Houston, Texas, and is widely regarded as the world's most important and influential Offshore Oil & Gas industry event. OTC brings the world together at the Reliant Park in Houston annually in May, emphasizing the drilling, exploration, production and environmental protection aspects of the offshore energy industry. For the first time last month, OTC held an event in Rio de Janeiro, Brazil and according to many visitor, participants and organizers it was a huge success.

The OTC Brasil 2011 is the first installment of this exciting event in Brazil. The thriving South American country was chosen to host the first OTC event outside of North America due to the new O&G discoveries which have been popping up in and around Brazil over the last five years, with the massive deepwater pre-salt light oil discoveries as main highlights of the new Brazilian oil boom. These very significant discoveries and their development, combined with the fact that the development of all of the new pre-salt and also many new post-salt fields is driving an unheard-of growth in the Brazilian offshore service industry and also the rebirth of the mothballed local shipbuilding industry and its supporting service and equipment industry.

This inaugural Brazilian event, held October 4-6, 2011, in Rio de Janeiro, was organized by the Offshore Technology Conference. The OTC Brasil 2011 was launched at the Riocentro conference center in Rio de Janeiro, agreeably close to the Barra da Tijuca beaches and not far from downtown Rio or the international airport.

This first installment of OTC Brasil conference exceeded the organizers´ expectations with more than 10,000 attendees and more than 400 companies from 23 countries represented in the exhibition with 90 Brazilian companies showing their projects, products and services to the global O&G industry. Two exhibition halls were fully occupied for the event, which had a total 11,500 sq. m. of exhibits showcasing the latest in technology from the world-wide offshore industry. Conference areas within the exhibition halls housed technical paper presentations, industry panels and many more discussions and technology presentations.

The conference welcomed three new supporting organizations, "Associação Brasileira de Engenharia Química" (Brazilian Association of Chemical Engineering)," Associação Brasileira de Geólogos de Petróleo" (Brazilian Association of Petroleum Geologists), and "Sociedade Brasileira de Geofísicos" (Brazilian Geophysical Society). It also gained the support of Rio Negocios, the Rio Business Agency, and attracted speakers from Brazil's Agencia Nacional do Petroleo (ANP), office of External Trade of the Ministry of the Development, Industry and External Trade (MDIC), and the US Commerce Department.

An interesting development was the addition of the university area in Pavilion 1, next to the booths of the OTC founders and its sister technical societies in Brazil (ABEQ and ABGP). The local universities shared information about their current projects at their research centers for the O&G industry, services and equipment, and how their curriculum will meet the needs of the Brazilian oil and gas industry presently and in the near future.

"We were extremely pleased with the turnout and success of the conference. The time was right to bring OTC to Brazil. The region is rapidly gearing up to be one of the world's largest offshore producers, and gathering the most influential associations and players in the industry will be a catalyst in developing the Brazilian offshore resources," said Ricardo Juiniti, OTC Brasil 2011 Program Committee co-chairman with OGX.

Although this first installment of the OTC Brasil, had a majority of foreign companies present and did not have a Petrobras booth, it was still considered a success as many local companies that did not participate this year have pledged to join the event next year.

Some of the highlights of the OTC Brasil 2011 were the in-depth technical program with emphasis on worker, environmental and equipment safety, deepwater pre-salt challenges, and discussions on how to safely and efficiently develop Brazil´s O&G reservoirs. There were several sessions that focused on developing both technological and human resources. There was also a session with service providers on how to supply technology to meet the region's needs. The greatest hurdle to develop the Brazilian offshore assets is the scarcity of technically trained manpower. Unfortunately there is no immediate solution to this and it may take another decade solve this problem, even with the aggressive training and scouting programs being pursued by the local government and both national and foreign companies. The importance of the OTC Brasil 2011 cannot be undermined as the country and its O&G related industries truly needs this internationally acclaimed event, which is a vital catalyst in bridging the gap between local and foreign companies and investors.

Plans for the second edition of OTC Brasil are already underway. The conference will take place October 8-10, 2013, again at the Riocentro convention center in Rio de Janiero.

www.otcbrasil.org

Caterpillar to Power 16 New OSVs in Brazil

Cat was on hand for OTC Brazil in Rio last month.

(Photo: Claudio Paschoa)

Caterpillar will power 16 offshore supply vessels (OSVs) for use in operation in the Brazilian offshore market. Caterpillar received orders requiring a total of 56 Cat and MaK Diesel Electric Propulsion Engine (DEP) generator sets for offshore supply vessel newbuilds. The vessels include four oil spill recovery vessels (OSRV) and 12 platform supply vessels (PSV). The Cat diesel generator sets ordered include the 3512C DEP in two power ratings: 1550 ekW at 1800 rpm (60Hz) and 1700 ekW at 1800 rpm (60 Hz); and the 3516C DEP, rated at 2000 ekW at 1800 rpm (60 Hz). MaK DEP power solutions ordered include the MaK 6 M 25 C DEP generator set rated at 1824 ekW at 720 rpm (60Hz) and the 8 M 25 C generator set, rated at 2433 ekW at 720 rpm (60Hz).

"The Cat and MaK DEP solutions are perfectly suited for the Brazilian offshore market, reliably delivering power and efficiency for offshore vessels," said Carlos Lima, Caterpillar Marine Power Systems Brazil manager. "We are proud to utilize local content in our DEP packages and serve our offshore customers in Brazil."

The constant-speed DEP engines offer the latest in EUI fuel system capabilities and state-of-the-art ADEMTM A3 Electronic Control Units (ECU). The vee-12, 4-stroke 3512C engines are available at 1360 ekW, 1550 ekW, 1700 ekW and 1825ekW, and the vee-16, 4-stroke 3516C engines are available at both 2000 ekW and 2250 ekW. All engine ratings are certified to the E2 emissions cycle, and meet EPA Tier 2 and IMO Tier 1 regulations. The electronic power station concept creates efficiencies between the control units, unit injectors, instrumentation and displays to perfectly balance power supply, fuel consumption and exhaust emissions at any given load.

The MaK DEP products feature an ultra-clean, HFO capable burning, long-stroke design and compact generator set design and unrivalled load pickup capabilities. The design enables customers to achiever longer intervals between service resulting in lowered overall costs of ownership. The MaK DEP products also feature low fuel consumption and increased overall efficiency.

Cat dealers Sotreq, based in Brazil, and Louisiana Machinery, led the Caterpillar efforts on the sale and will continue to deliver service and support excellence on

Familiarization Tales

BC Ferries Leads in Innovative Training Practices

BC Ferries has advanced the state-of-the-art in familiarization training and clearance, implementing what they call the "SEA Program" — which stands for "Standardized Education and Assessment". Once fully rolled out, it will be used for on-the-job familiarization and clearance for all 3,500 operational employees across the deck, engineering, catering and terminals departments.

By Murray Goldberg, Marine Learning Systems & Jeff Joyce, BC Ferries

The gap between the knowledge required to safely operate our increasingly sophisticated vessels, and the ability of our current familiarization practice of job shadowing to impart that knowledge is growing ever wider. Yet while we have made great strides over the years in terms of simulation and marine certification training, the practice of job shadowing for job and familiarization training remains an unchanged staple for many (probably most) maritime organizations. Therefore it is high time that we turn some of the attention that we devote to maritime training to the task of job and familiarization training in the maritime industry.

In this article we look at a familiarization training success story - that of the British Columbia Ferry Services Inc. (BC Ferries). BC Ferries has moved the industry a significant step forward by advancing the state of the art in familiarization training and clearance. They have implemented what they call the "SEA Program" - which stands for "Standardized Education and Assessment". The program is half way through its company-wide implementation and, once fully rolled out, will be used for on-the-job familiarization and clearance for all 3,500 operational employees across the deck, engineering, catering and terminals departments.

BC Ferries, like most marine organizations, previously used a job-shadowing approach for familiarization and clearance. While recognizing that this system had some very positive aspects, BC Ferries felt that job shadowing suffered from variability and lack of standardization due to the varying levels of mentoring skills and job knowledge, as well as daily operational constraints of the person being shadowed. It also had the tendency to perpetuate the imperfect or anachronistic practices of the person being shadowed to new employees. Likewise, the clearance process which was based on a checklist of competencies was susceptible to varying levels of objectivity and rigour depending on who was filling out the checklist. In all, this created an opportunity for improved training and assessment, with a resulting improvement in performance and safety.

The principles of the SEA program are:

- Standardization of process and consistent curriculum
- Trained trainers and clearers, solely focused on training
- Capturing best practices in the documentation
- Comprehensive supporting materials available to trainers and candidates
- Rigorous and auditable training and assessment
- Multi-modal assessments to ensure that candidates are appropriately tested and prepared to perform
- Measurement and analysis to support continuous improvement
- Provision of resources for ongoing skill enhancement and progression to next position
- Efficiency in delivery to either maintain or reduce the cost of training

SEA PROGRAM PHASES

The SEA program varies somewhat by position, but the core system is delivered in four phases as outlined in the schematic below:

Phase 1 is self-study. In this phase, candidates learn on their own from a comprehensive set of learning resources tailored to their position. The materials include self-tests so the candidates can

gauge their progress and readiness to move on to the next phase. The goal of this phase is to provide the candidates with the fleet-wide fundamentals for that particular position, thereby bringing them all to a common level prior to embarking on the vessel/route/terminal-specific on-board/on-site phase of training. Phase 1 culminates in an assessment called the "Summative Exam." This is a written test, typically taken on-line, and acts as the gate between phases 1 and 2. If the candidate achieves a minimum of 80% on this exam, he or she is allowed to move on to phase 2, which is on-board/on-site education.

Phase 2 is onboard or on-site education. This phase takes place on-board the vessel or on-site at the terminal where the candidate is taught by a trained and dedicated trainer (i.e. they are not part of the operational crew while training) who is well versed in the SEA program, company best-practices, and adult education. Up to four candidates can be trained simultaneously by a single trainer, though fewer may be appropriate depending on physical space or ergonomic restrictions of the training venue (i.e. smaller bridges may reduce class size). When not conducting SEA training, the trainers are active crew on the vessel or terminal , thereby bringing their experience to bear during SEA training events. The trainers have been selected for the training role and, while training, are 100% focused on the candidates' learning needs, as opposed to simply being shadowed while performing regular duties.

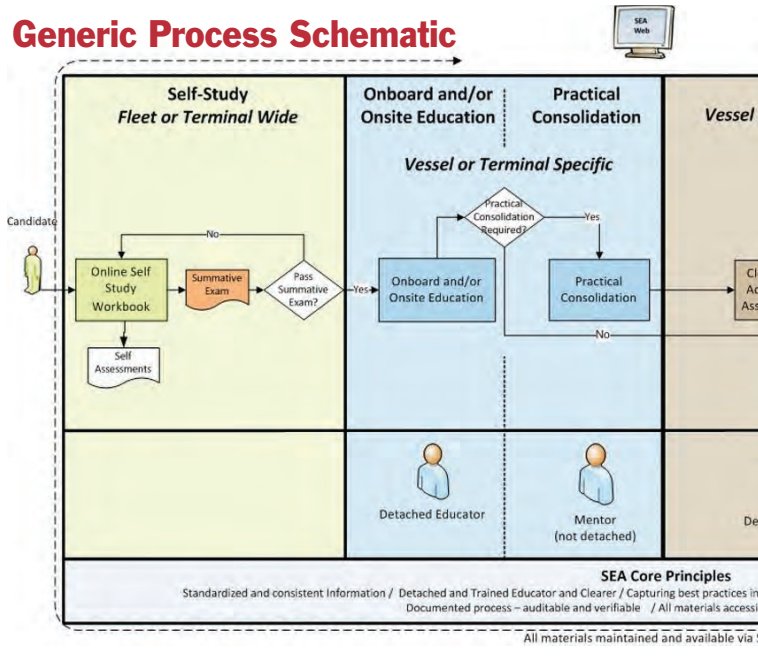
This phase is highly effective and efficient, and is made more so by the fact that the candidates come equipped with significant knowledge gained during phase 1 as proven by the summative exam at the end of that phase. Also, having dedicated, trained trainers focusing completely on the SEA candidates greatly adds to the effectiveness and efficiency of the training process.

Phase 3 is the Clearance Phase where the candidate is assessed for readiness to perform his or her duties. The clearer is also trained in the SEA program and in the intricacies of clearance, and is always a different person than the Trainer in Phase 2. This eliminates subjectivity potentially created during the education phase and allows the clearer to be completely objective during the clearance process.

The clearance phase consists of:

- Demonstrative performance where the candidate demonstrates abilities such as a vehicle deck loading sequence or securing the vessel in berth
- Verbal scenarios where the candidate addresses a set of

Generic Process Schematic



pre-determined scenarios applicable to their new position

- A randomized multiple-choice exam that is either paper-based or online depending on internet connectivity. This exam is a critical component of clearance in that it tests rigorously, comprehensively and most of all, objectively
- A meeting with the Master (in the case of the deck department) or other Senior Supervisor along with the Clearance Officer to ensure that confidence can be placed in this candidate regardless of the testing outcomes.

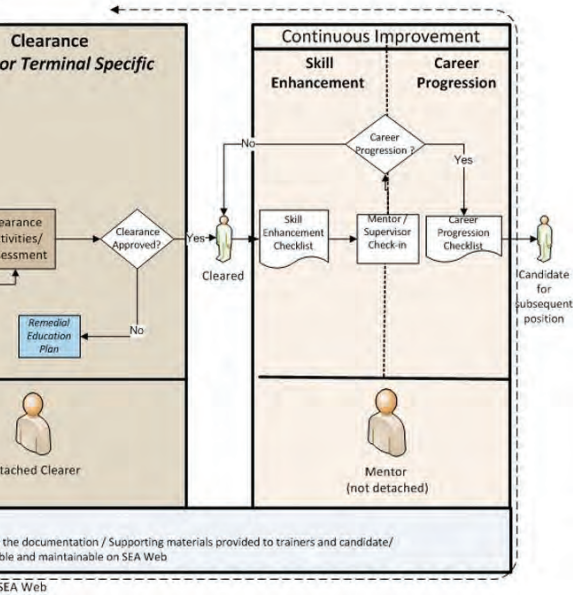
The candidate is required to pass all 4 components of the Clearance Phase in order to be cleared for duty.

Phase 4 is the continuous improvement phase. Continuous improvement is a core principle of the SEA program and applies in many different ways. In this case, continuous improvement refers to ongoing skill enhancement and support for career progression for each employee trained using the SEA process at BC Ferries. In this way, the SEA process is not a one-time or periodic event which comes into play only when an employee is to be cleared for a new position, new vessel or new terminal. Instead, the SEA process is a part of the employee's continual professional development, supporting the employee and ensuring professional and safe practices throughout their career at BC ferries.

LEARNING MANAGEMENT SYSTEM (LMS) SUPPORT

All aspects of the SEA process are supported by a web-based learning management system for the maritime industry called MarineLMS (referred to as "SEA Web" at BC Ferries). This is a web and paper-based system which has been customized to deliver learning materials specific to BC Ferries' vessels, routes and jobs. It also supports written examinations and provides tracking and analytics for performance monitoring and continuous improvement. The system is used at BC Ferries to:

- Deliver all learning materials (which are numerous and sophisticated) which are part of the SEA process.
- Manage the maintenance and ensure the currency and correctness of those materials.
- Objectively deliver and automatically grade all assessments (tests), either on-line or on-paper as needed.
- Provide metrics which allow BC Ferries to "measure" the training process



and outcomes in order that a process of continual improvement can be enabled.

- Provide an on-line community to support the trainers ensuring the sharing of best practices, improving trainer buy-in, and enabling the mentoring of new trainers.

BENEFITS

While the advantages of SEA at BC Ferries are numerous, the primary benefits are standardization, objectivity, more effective familiarization period, and heightened insight into the educational process and outcomes.

Standardization. Standardization is arguably the primary benefit. Traditional job shadowing, despite its positive aspects, suffers from the drawback of perpetuating suboptimal practices; trainees inheriting the bad "habits" of the person being shadowed. The SEA process greatly reduces the incidence of this in two ways. First, all phases of the process are supported by company-vetted best-practice learning materials. During self-study, trainees are learning only standardized lessons created by BC Ferries. Second, during on-board familiarization, trainees are being taught by dedicated trainers who have themselves been trained as adult educators and are supported by company-created familiarization materials. All of the company-vetted, standardized learning and support materials are available on the LMS during training, and after to support the mariner throughout their career at BC Ferries.

Objectivity: Objectivity is enhanced at BC Ferries through a more formal clearance process. Clearance at BC Ferries in the past involved a senior employee testing the candidate with the support of a checklist. If the senior employee felt the candidate understood the item on the checklist, a mark was placed on that item and testing moved on to the next item. This is a very common approach, but suffers from a great degree of variability in terms of what constitutes "understanding". The SEA process formalizes the clearance process by adding required demonstrations proving the capability of the candidate, an oral "scenario" based examination, a meeting with the Master, and finally, a written multiple-choice exam which is randomized and delivered by the LMS. Written exams are unparalleled at objectively assessing knowledge, and therefore form one of the main pillars of objective assessment in the SEA program.

Effectiveness: The on-board familiarization phase is one of the greatest differences compared with the old practice of job shadowing. First, it is now preceded by the self-study phase. One effect is that now trainees arrive on-board with a uniform level of knowledge which did not exist before. This allows on-board familiarization to be far more effective and direct. Candidates already have the "knowledge" and are now acquiring the "experience" onboard. In addition, because the on-board familiarization is now led by a dedicated trainer, the trainees receive undivided attention and intense instruction. The combined effect is that the on-board education duration has been reduced from a variable period of one or two weeks to a predictable 5 days.

Insight: Finally, there is now a level of oversight and analysis in the educational process which was not previously available. Most of this comes from the employment of the learning management system, MarineLMS. For example, learning page access logs indicate, on average, how long learners are spending on the

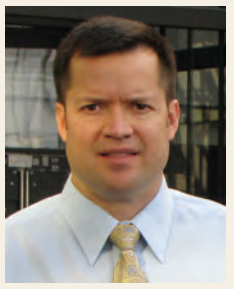
various topics. This can help identify outliers which may represent difficult materials in need of improvement. In addition, exam logs indicate overall company performance to ensure that employees are meeting standards, on average. Question analytics indicate not only how often each question is answered correctly or incorrectly, but also show the frequency with which each incorrect answer is chosen. This helps highlight, and then correct, common misperceptions among employees. Finally, audit logs record all significant learning events such as exam delivery, exam review, system access, and so on, to provide an audit trail and help preserve the security and integrity of the learning process.

CONCLUSION

The SEA process has been very well received for its objectivity, standardization, professionalism, and improved and consistent learning outcomes. It represents a major turning point and improvement towards a modern, best-practice job and familiarization training system. Thus far it has been used to train hundreds of BC Ferries employees on its way to being rolled out company-wide. As Sam Manson, BC Ferries trainer, puts it: "Standardization is the greatest advantage of the program. Now all candidates receive the same high quality training and a fair assessment."

BC Ferries success is one we can all learn from, but there are many other familiarization tales out there - successes and challenges that we can learn from as well. Let us write about your story so we can all learn from it! Is your organization leading the way in job and familiarization training? We'd like to write about it. Or, do you have an example of a poor familiarization experience or practice that we can all take lessons from? We would like to write about that too (without naming you or your company, in this case). Contact Murray by email at Murray@MarineLS.com. You have a familiarization tale to tell. You can benefit everyone by sharing it.

About The Authors



***Jeff Joyce** is the Director of Operational Training and is the Project Manager for SEA development at BC Ferries. A retired Canadian Naval Officer, Jeff is keenly interested in developing sustainable learning practices in the marine industry. He is contactable at jeff.joyce@bcferries.com*

***Murray Goldberg** is the CEO of Marine Learning Systems, maker of MarineLMS. A researcher and developer of learning management systems, his software has been used by 14 million people worldwide. He can be reached at Murray@MarineLS.com.*

$68B

Floating Production to see massive investment though 2016

By Lucy Miller, Douglas-Westwood

The new edition of *The World Floating Production Market Report* from energy business analysts Douglas-Westwood forecasts a strong increase in expenditure over the next few years, driven by a surge in installations. The report predicts that more than 130 floating production systems will be installed worldwide over the 2012-2016 period at a total value of approximately $68 billion.

The FPS sector came into being in 1975 when Transworld 58, a converted semi-submersible mobile offshore drilling unit (MODU), was installed on Hamilton Brothers' Argyll field in the UK sector of the North Sea. Today FPSs are used for a very wide range of developments in all water depths and environments.

The market is segmented by the following FPS types:

- Floating Production, Storage and Offloading vessels (FPSOs)
- Floating Production Semi-Submersibles (FPSSs)
- Spars
- Tension Leg Platforms (TLPs).

GLOBAL FPS FLEET TOTALS

- **FPSOs** – are ship-shaped vessels, often tanker conversions, and dominate the global floating production sector. There are currently more than 150 vessels in operation. Asia and Africa have the largest fleets, followed by Latin America.
- **FPSSs** – have a long history and have proved particularly popular off Brazil where the national operator, Petrobras, has embraced FPS technology as a means of developing the country's extensive deepwater reserves. There are currently around 40 FPSSs in operation, including a number off Brazil, Western Europe and the US Gulf of Mexico.
- **TLPs and Spars** – these have become the production system of choice in the US Gulf of Mexico. The majority of the world's operational TLPs and Spars have been associated with developments in this area. Recent years have seen the introduction of smaller, less expensive, designs to enable the exploitation of marginal fields.

MARKET DRIVERS

On the demand side, three main drivers can be identified in the continued growth of the FPS sector:

- Continuing expansion in the use of subsea production technologies
- The industry's move into deepwater areas
- Growing emphasis on uses other than life-of-field production.

This move to deep waters is a key driver for the FPS market. Beyond water depths of 500 meters it becomes uneconomic to install a fixed platform, leaving an FPS installation as one of the few options available. FPSs are also used in shallow water developments, for processing alongside small wellhead fixed platforms, as central production hubs or as part of rejuvenation programmes. Since FPS can be redeployed these units are ideal for use as early production systems or for other contracts of short duration.

On a regional level, the surge in Latin American FPS activity, which accounts for half of the projected Capex, is driven by local operators Petrobras and OGX, who plan to significant increase their fleets of FPSOs over the period to 2016.

The deepwater basins off West Africa are also a key focus areas for FPS developments with several projects planned in Angola and Nigeria.

BRAZIL

Brazilian operators Petrobras and OGX plan to massively increase their FPS fleets. Many of those units will be built in Brazilian yards using locally sourced equipment and labor. The majority of FPS installation is expected to take place on the Espirto Santo, Campos and Santos Basins, located on the country's southeast coast, which contain the vast majority of Brazil's proven reserves. Many of these fields lie in water depths greater than 500 meters.

Petrobras' projects are typically characterized by phased multiple FPS developments. Current and future projects include:

- Franco
- Guara and Guara North
- Lula and Lula North East
- Parque das Baleias
- Papa Terra
- Roncador

Petrobras also uses FPSOs for extended well tests prior to the commencement of full production. According the company's recent business plan 19 such tests are planned for the next five years.

OGX is part of the EBX conglomerate, owned by billionaire Eike Batista. The group also includes Brazilian leasing contractor OSX (from which OGX are expected to source the majority of their FPS units). Unlike Petrobras, the vast majority of OGX's prospective developments are in shallow waters. However, the company is exploring deepwater areas of the Espirto Santo basin.

SUPPLY FACTORS

- **Financing** – FPSs will normally be constructed to order and significant financing needs to be secured prior to the commencement of construction. At present there is considerable uncertainty surrounding the short-term outlook for the banking sector as a result of the debt crisis in Europe and this may threaten the availability of financing for this sector.
- **Leasing** – an active market has emerged in the FPSO segment in particular and nearly 40% of the world's FPS fleet is now owned by leasing contractors. In recent years, the contractors have picked up a number of significant project awards based on the deployment of converted vessels – predominantly tankers. The redeployment of modified/upgraded vessels, especially in the leased FPSO segment, will play

an increasingly important role in meeting the growth in market demand.

- **Local content** – such requirements are becoming increasingly important. In Brazil, Petrobras is aiming to source up to 70% of its FPS related equipment from local providers.

OGX is also planning to source most of its units from Brazilian shipyards, in particular those owned by its parent company EBX.

MARKET FORECAST

DW forecast a total of 134 installations over the 2012-2016 period, with a global Capex of $68b.

These installations represent a 37% increase on the 2007-2011 period, with a corresponding increase of 81% in Capex terms. The disparity between the two percentages is a reflection of factors such as:

- A larger proportion of newbuilds and conversions compared to redeployments
- A greater degree of local content, raising the cost of relevant equipment and services
- Cost inflation.

FPSOs represent by far the largest segment of the floating production market in terms of numbers and account for over 80% of the forecast Capex.

As mentioned previously, Latin America accounts half of our projected Capex. When comparing this to the number of installations forecast it is clear to see that the region has higher than average capital costs compared to others. This is largely due to strict local content requirements.

Africa is the next most important region in both numerical terms and forecast Capex as, like in Latin America, a large proportion of the African installations are large units installed in deepwater areas.

Although a predominantly shallow water region where fixed platforms are utilized, Western Europe is expected to see several FPS installations over the next five years. Some of these projects revolve around the rejuvenations of mature producing areas where FPSs are used to provide water injection capability.

A large number of orders are expected during the course of 2011 and 2012. This includes a bulk order for Petrobras, the Brazilian NOC. The company is expected to order twelve vessels during 2011, six which are destined for the Lula (Tupi) development. Many of these FPSOs will be newbuild units, with hulls constructed at the Brazilian yards.

Not surprisingly Petrobras, with forecast Capex of $21.6bn, is expected to be the biggest spender over the coming five years, followed by fellow Brazilian operator OGX and 'supermajors' such as Total, Shell and BP.

About the Report

'The World Floating Production Market Forecast 2012-2016' **is the latest in an acclaimed series of business studies used by organisations in over 70 countries. These include oil majors, drilling companies investment banks, OEMs, contractors, and government departments & agencies worldwide. Market forecasts are based on DW's in-house Oil & Gas database which details over 900 FPS projects. For more information, or to order this report:**

www.dw-1.com

Unmanned Maritime Systems

The UMS defense market is forecasted to exceed a cumulative $7B between 2012 and 2020, whereas the UMS security market is expected to surpass a cumulative $600m between 2012 and 2020.

By Antoine Martin, Unmanned Vehicles Systems Consulting

The unmanned maritime systems (UMS) market is coming of age, rapidly evolving under the combined impact of changing economies, operational and technological advances, and maritime threats. The UMS defense market is forecasted to exceed a cumulative $7 billion between 2012 and 2020, whereas the UMS security market is expected to surpass a cumulative $600 million between 2012 and 2020. Although the UMS security market remains considerably smaller than the defense market, the growth rate of the security market is forecasted to be much more robust than that of the defense market. It is quite obvious that although the unmanned maritime market is still emerging, the number of stakeholders is very small compared to unmanned aerial vehicle markets, and challenges abound - with each challenge so abound opportunities for those who know what to pick up and how to execute.

Many factors are leading the surge of interest in UMS. Here are a few below:

- **Maritime Security on the increase and changing:** terrorists' attack on the USS Cole in 2000, increasing maritime piracy despite attempts to curb it, the rising threat of Iran in the Middle East, territorial disputes in Eastern Asia, asymmetric warfare on the rise - all contribute to nations' need to better secure littorals, ports, estuaries, channels, and bodies of water. UMS offer improved response capabilities to the new maritime security threats - better than traditional equipment that has not changed in nature since the sixties.
- **Evolving Technologies:** The transition from large and expensive vessels to multi-mission frigates results in the introduction of a number of new vessels, some already in operation and others just conceptual. These new designs are meant to undertake a number of missions, from mine countermeasure to surface warfare. These ships, less capable than multiple dedicated ships, rely on UMS to perform specific missions. UMS offer to increase both power and capabilities.
- **Military Budget Pressures:** Economic pressures are forcing many nations to reduce their military budget. Homeland and security budgets are already strained, inadequately funded, and suffer even more. This means that fleet of vessels are insufficient and delayed. The trend to have fewer but more capable ships is now resulting in a lesser naval force. Cruisers and destroyers are giving way to cheaper multi-mission frigates. Ships are used past their recommended operational life. More importantly, as manpower remains the most expensive element of military budgets, UMS may help reduce manpower demands, while keeping, even augmenting, capabilities.
- **USV Technical Maturity:** A number of Unmanned Surface Vehicles and associated sub-systems have been tested, improved, their concept of operations developed, and they have attained a degree of maturity such that they will move from research and development to procurement. In addition, new designs are broadening their field of applications.
- **Unmanned Aerial and Ground Systems:** Remotely Piloted Aircrafts have shown their value and limits in real conflict scenarios; Unmanned Ground Vehicles (UGV) have saved countless lives in Improved Explosive Devices mitigation roles. A number of

countries are already using unmanned systems, so their operations, procurement, and use is better known amongst the armed forces, and is transitioning now to security communities. Government administrations are now integrating unmanned systems as part of their overall operational planning.

- **UUVs:** Unmanned Underwater Vehicles demonstrated their worth over and over again in mine countermeasures operations and are ready to transition to other uses.

Evolving Threats

Along with the evolution of technologies, there is a significant evolution in the nature, scope and magnitude of maritime threats. Terrorists are expressing clear intentions (and often actually carrying out or trying to carry out their threats) to attack oil tankers, cruise ships, natural gas plants, offshore platforms and place bombs in harbors and among public gathering events. States and non-state actors threaten to block congested waterways, damage underwater pipelines, and in general harm sea-borne commerce. Pirates are taking dozens of ships and their crews hostage for ransom; undocumented migrants flood maritime borders, illegal drugs smugglers seek increasingly innovative maritime paths, including submerged and semi-submerged vehicles (in addition to super-fast surface boats), people, and arms smugglers – all these are challenging the capacity and capabilities of the world's maritime border defense and security operators.

Submarines are very powerful naval vessels, with a tempting capacity to project threats and power across vast distances. Many nations are adding submarines to their navies for the first time, and making effective use of these new capabilities in local and global geopolitical maneuvering, including in sensitive regions such as the Middle East and the Persian Gulf.

Small speed boats pose a threat near littorals; even very capable ships find them a challenge. The world's navies still do not have an effective response answer to counter such threats.

For each of the above threats, UMS are poised to offer the right counter-threat tools. UMVs (the actual moving vehicle as opposed to the entire system including the command and control station) are nimble, can operate in environments where traditional vessels dare not go, separate personnel from potentially harmful situations, enable autonomous piloting, are stealthy, and economic. In essence, they are part of the desired response for naval and maritime threats of the 21st century – from an operational, economic and technological perspective.

Evolving Solutions

A close scrutiny of the broad UMS market sector reveals several potential evolutionary paths:

- USV adoption is much faster and reaches more users than the adoption of UUV, mostly because of the possibility to remotely control USVs, receive high bandwidth real time feedback from the vehicle, and reuse many of the sensors and standards developed for Unmanned Aerial Ssystems
- The security market for USV will

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surpass the security AUV market by 2015

- The arms race from the cold war is transforming to an all-domain unmanned systems race over the next two decades
- The mixed used of UMS for environmental remote sensing, security, and defense will continue to increase and present opportunities for small and low-cost platforms
- USVs will marginally be used for anti-piracy roles in the near term
- Oil & Gas stakeholders will be the first private users of USV for security and defense roles (or they will force governments to protect their private interests). Note that the oil & gas industry has been the largest user of UUVs for private and commercial purposes
- The main obstacle to the sales of USVs lies in the navies' realization of the capabilities of unmanned maritime systems. Adoption of technology has been slow. Once the capabilities and potential are recognized, the hurdle is not technological but rests in operating the system: how to use the USV with existing equipment, effect functional launch and recovery, calculate the life costs and operational costs of using USVs, manpower required to operate USVs, developing funding for this new equipment at the expense of other, and an old acquisition process that does not suit asymmetric warfare pace.

Future UMS Uses

There are far too many UMS future uses to list in this article. I present here three representative future uses for UMSs. It is important to note that each use presents multiple business opportunities for operators, innovators, components & parts manufacturers, systems integrators, private and government contractors.

Environmental Monitoring

The BP Oil disaster in the Gulf of Mexico had a dramatic impact on several economies, from fishing to energy. A number of countries will want to deploy long endurance UUV "gliders" to constantly monitor the seas and exclusive economic zones. Data about the ocean will also increasingly be gathered in the Arctic, where climate changes are quite visible. Persistent operations are too costly to be performed by manned operations, and only unmanned equipment can perform them in a cost effective manner. Extreme environments such as the poles, and access to remote and dangerous locations —which often yield the more insightful data — is much better suited to UMS. In addition, there is significant interest from defense and security governments to gather environmental data and create models & make predictions.

About the Report

"Unmanned Maritime Systems - Defense & Security UUV & USV – Markets, Technologies & Opportunities Outlook – 2012-2020" includes 530-pages, 292 Figures and 223 Tables. You can find more information and order the report at

http://marketintelgroup.com/unmanned-maritime-systems-umv-usv-uuv-defense-security-markets

Cummins Debuts "Hedgehog" Platform

Designed Ready to Meet EPA Tier 4 in 2014, Engine Dubbed the "Most Powerful" High Speed Diesel Engine

Cummins has thrown down the diesel engine development gauntlet, recently introducing its new Hedgehog High Speed Diesel Engine platform, a line which includes the world's most powerful high speed diesel engine ever built which is designed ready to achieve EPA Tier 4 performance emissions in 2014. Perhaps as significant is that the Hedgehog platform, led by the 4,000 hp QSK 95, signals the manufacturer's intention to extend the province of high speed diesel power units into applications traditionally dominated by medium speed engines, namely the workboat market.

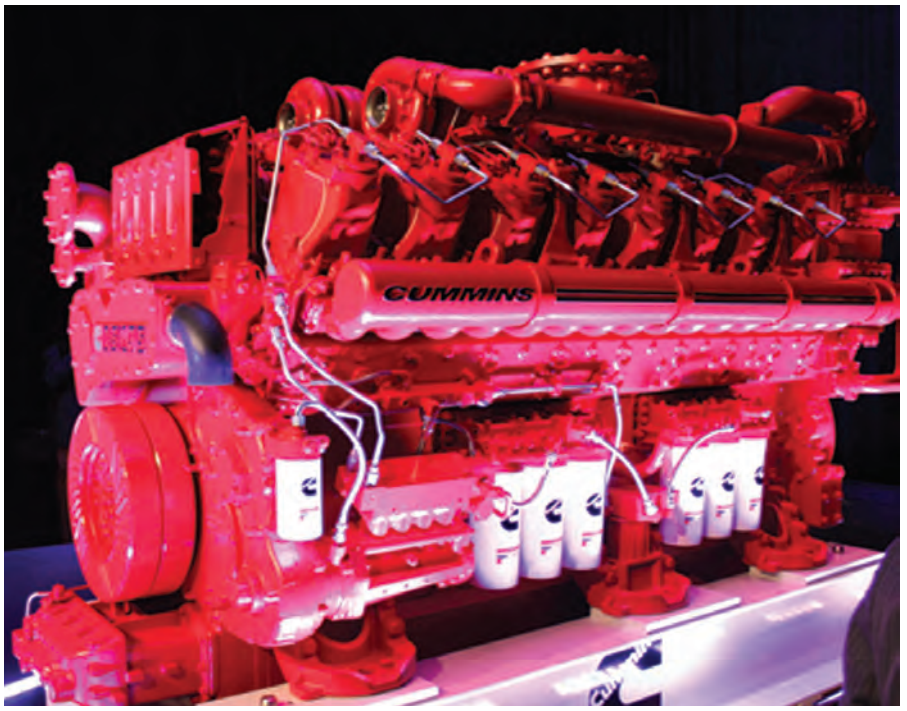
– by Greg Trauthwein, Editor

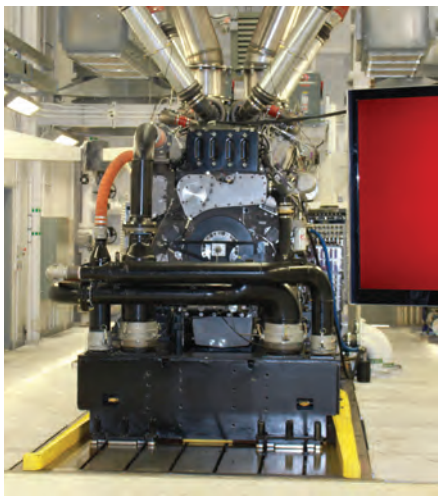
The event to introduce the Hedgehog platform to global industrial markets was held at the Cummins' Columbus, Indiana headquarters as well as its Seymour, Indiana, engine plant, and was the single largest customer event in the company's history, attracting more than 130 users from around the globe. The event also served as an opportune time for Tim Solso, only the fifth CEO and Chairman in the company's storied 92 year history, to formally announce before hundreds of the manufacturer's key clients the passing of the leadership reigns to Tim Linebarger, current Cummins President and COO and soon-to-be sixth CEO and Chairman in Cummins history, upon Solso's retirement at the end of 2011.

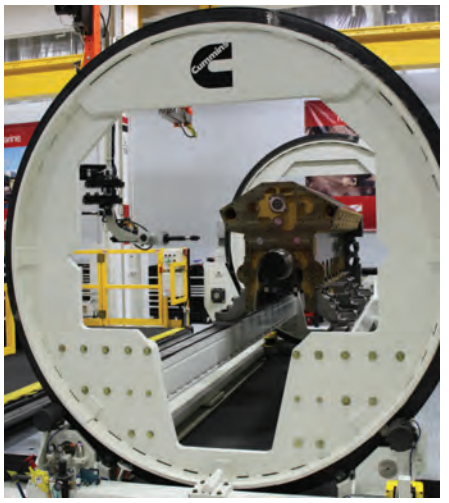
"We have needed a bigger engine (for many years), and Hedgehog is a new era for Cummins," said Solso.

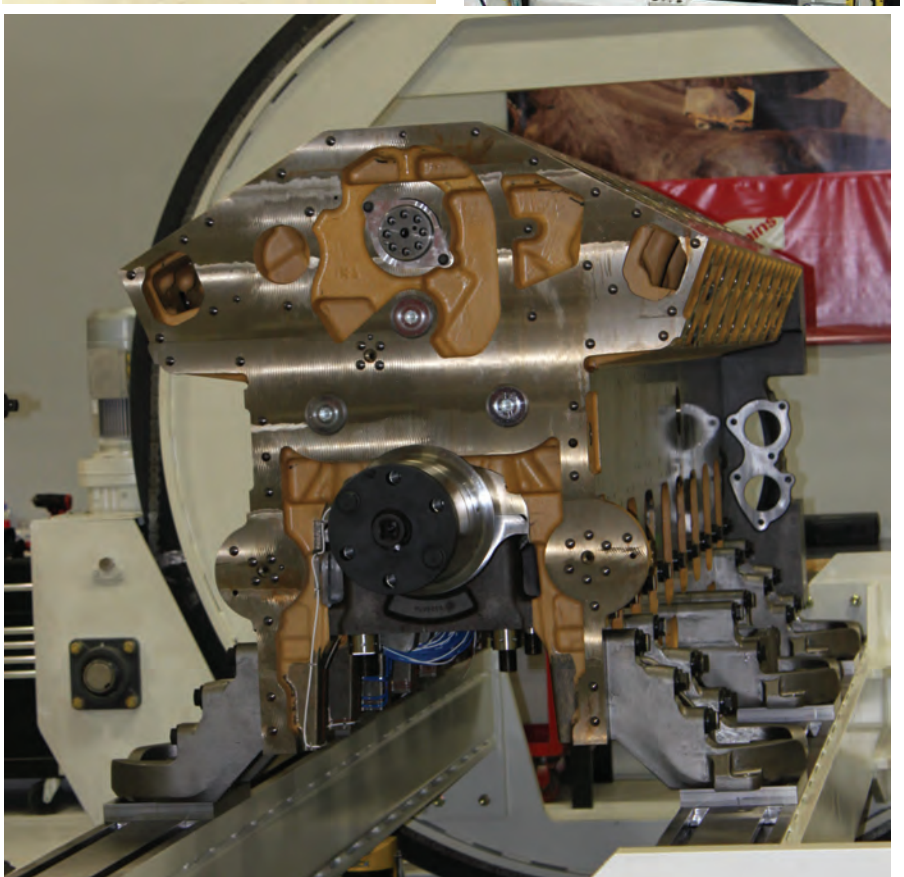
Linebarger and company have established lofty performance goals, and it views the Hedgehog platform as not simply a new engine, rather an integrated power providing platform geared to helping its customers across all industry make its operations more efficient and profitable. The company this year has set a record of $18b in sales, but has set an aggressive growth plan of 15% per annum with a target of $30b in sales by 2015.

Cummins sees the lion's share of growth coming from outside its traditional stronghold of North America, and specifically views emerging markets as the fuel. To foster the growth, it has charted an aggressive investment plan in technology, the supply chain, service and support. "We are investing aggressively to stay ahead of the competition," said Linebarger. Investment in the Hedgehog platform is proof of the plan. "This is the highest power high speed diesel ever built," said Linebarger, exceeding the performance of all high and medium speed diesels in its power range.









MEET THE HEDGEHOG

Before addressing the key technical parameters of Cummins' new engine platform, one may wonder: why the name "Hedgehog?"

The Hedgehog name was championed by Blake Larson, Cummins' Executive Engineer, High Horsepower Engineering, and derived from the book entitled *"Good to Great"* by Jim Collins.

"Good to Great" addresses a single question: **Can a good company become a great company, and if so, how? To illustrate its point, the book uses two animals: a fox and a hedgehog.** An ancient Greek parable distinguishes between foxes, which know many small things, and hedgehogs, which know one big thing. *"Good to Great"* surmises that good-to-great leaders are hedgehogs, who know how to simplify a complex world into a single, organizing idea—the kind of basic principle that unifies, organizes, and guides all decisions.

Thus as Cummins works to position itself as the provider of efficient, reliable and robust power solutions of choice, a true business partner and integrated power provider across industries and around the world, it's focus on power is Hedgehog-like indeed.

Plans for the Hedgehog platform were hatched in 2008, and three years, 153 engineers and 365,000 engineering hours later, Cummins has gone from a literal

Cummins recently unveiled its "Hedgehog" platform, a new family of high speed, high power diesel engines that are designed ready to meet Tier 4 emission requirements in 2014.

The lead engine, pictured top, is the QSK 95, a 16V, 4,000 hp unit.

Development of the Hedgehog platform entailed massive investment in the Cummins Seymour plant, including new testbeds (center left) and an ultra-modern manufacturing facility (center right and below), which is still in the works.

(Images: Greg Trauthwein)

clean design sheet to what it views as the diesel engine power solution for a coming generation. The creation of the platform was enabled in part by the company's investment in the new Cummins High Horsepower Technical Center at its Seymour, Indiana plant, an investment which includes the overall modernization of the 35-year-old facility eventually the nearly doubling of its size to more than 800,000 sq. ft. Part of this modernization is a bank of 10 new engine test cells, six dedicated to the Hedgehog brand allowing the company to design and test specific engines for each of the particular markets it serves. The first Hedgehog engine is the 4,000 hp, V16 QSK 95, which just started on the test bed in October 2011. The current plan is to offer prototype engines by 2013; limited production in 2014; and full production in 2015. Linebarger explained that the company announced plans for the platform at this time to allow potential users and designers to build the engine into future project plans. While the full commercial availability is still several years away, Cummins has already announced its first commercial customer in the rail sector. GO Transit of Toronto has committed to repower its 11 locomotives with the Tier 4 QSK 95s

The new 4,000 hp (2983 kW) QSK95 is a 95-liter, 1200 to 1800 rpm, 16-cylinder engine, with single-stage quad turbocharging and high-pressure fuel injection. It is designed ready to meet EPA Tier 4 low-emissions regulations taking effect in 2014.

The QSK95 – which is just the first engine in the platform envisioned to include V12 and V20 versions – offers flexibility in power configurations for propulsion, auxiliary, genset and diesel electric applications, and with ratings from 3200 hp to 4000 hp (2386-2983 kW), the QSK95 is targeted to areas of traditional medium speed engine dominance, specifically tugs, inland waterway towboats, offshore support vessels, passenger transport, dredges, short sea cargo and coastal tankers. Cummins also intends to design and offer natural gas powered versions of the engine, as it projects that by 2020 thirty percent of high horsepower engines will be natural gas powered.

Cummins is projecting the unit a contender in the medium speed world given several key factors, including the advantage of a lower capital cost, a more compact installation and exceptional fuel efficiency.

The QSK95 is easily integrated with Cummins C Command Elite Premium and Elite Plus class-approved panels. C Command instrument panels include a selection of monitoring and display options to help operators protect and enhance engine operations and manage operating costs by logging critical operating parameters such as engine load, duty cycle, speed and fuel consumption, while providing diagnostic and prognostic capabilities.

The QSK95 meets IMO Tier II and EPA Tier 3 emissions standards with fuel injection and clean combustion technology. For highly emissions-regulated areas around the world, the QSK95 will lead the way forward for 4000 hp (2983 kW) marine engines to achieve EPA Tier 4 emissions using Cummins own exhaust after treatment systems, its Selective Catalytic Reduction (SCR) system which literally is designed to allow the user to remove the mufflers and install the SCR.

The Hedgehog theme was evident throughout the biggest launch event in Cummins corporate history, from current president and incoming CEO Tim Linebarger's (right) opening presentation to the celebratory luncheon dessert. (inset)

Landing Craft Vessel for Alaska Fitted with Triple Jets

Armstrong Marine, Port Angeles, WA, delivered Arctic Solution, a landing craft to transport equipment and personnel to and from oil producing regions near Prudhoe Bay, AK. Arctic Solution was built for Arctic Marine Solutions in Seward, Alaska, to an innovative landing craft design developed by Pat Eberhard, Engineer and owner of CoastWise Corporation. This new new design is co-owned by Arctic Marine Solutions and CoastWise Engineering. When laden, the 38.6 ton (85,000 lb.) vessel has a sprint speed of 30 knots (Lightship 35 knots). It is a shallow water RoRo passenger and vehicle ferry, and features a planing hull form. It is certified to carry two crew and 49 passengers and also to carry hazardous materials.

Main Particulars

Builder: . . . . . .Armstrong Marine
Type: . . . . . .Landing Craft
Construction: . . . . . .Aluminium
Length: . . . . . .57 ft. (17.4m)
Beam: . . . . . .18.3 ft. (5.6m)
Draft: . . . . . .22 in. (0.56m); Loaded 28 in. (0.71m)
Displacement: . . . . . .38.6 ton (85,000 lb.) laden
. . . . . .27.2 tonne (60,000) lightship
Speed : . . . . . .30+ knots laden Lightship 35 knots
Propulsion:Triple UltraJet UJ410 Reverse & Steering
Controls: . . . . . .UltraJet
Engines: . . . . . .3x Scania DI12 66 M
Transmission: . . . . . .ZF325-1, 1.167:1 ratio
Fuel: . . . . . .980 gallons/ 3706 litres
Crew and Passengers: . . . . . .2 crew

Because of the vessel's size, Armstrong Marine constructed the hull and wheelhouse in two sections and it is Armstrong's and CoastWise's attention to detail, that makes this vessel stand out. Three removable pods were also built for the landing craft to each seat 12 workers, and can be fixed as required to the vessel's deck for ferrying personnel to drilling sites. The bow ramp designed by Pat Eberhard is very impressive and can load heavy vehicles from unimproved beaches. It has the ability to sustain a 65,000 lb. load for extra durability in the harsh environment of the North Slope.

Lightship Arctic Solution has a payload of 28.7 tons (63,235 lb.). She is powered by triple 485 kW (650 hp) Scania DI12 66M diesel engines coupled to triple UltraJet 410 waterjet propulsion systems, via ZF325-1 transmissions. The exceptional maneuverability is achieved with an UltraJet JetMAster-Pro electrohydraulic control system fitted for steering and independent operation of the three reversing deflectors.

New Exhaust Manifold V-CAT Catalyst System

MIRATECH announced a successful first year demonstration of its new V-CAT Integrated Diesel Oxidation Catalyst System on a vessel powered by two EMD 12-645 diesel engines in service in California. MIRATECH, in partnership with Foss, has now completed the first year of a three-year program to demonstrate emissions reduction from the M/V Brynn Foss, using MIRATECH embedded diesel oxidation catalyst (DOC) systems known as V-CAT on the tug's EMD engines. The V-CAT system is designed to reduce particulate matter (PM) 30-50%, hydrocarbons (HC) 50-70% and carbon monoxide (CO) 80-90% at full load conditions. The program was funded via a grant through the Port of Los Angeles, CA. **www.miratechcorp.com**

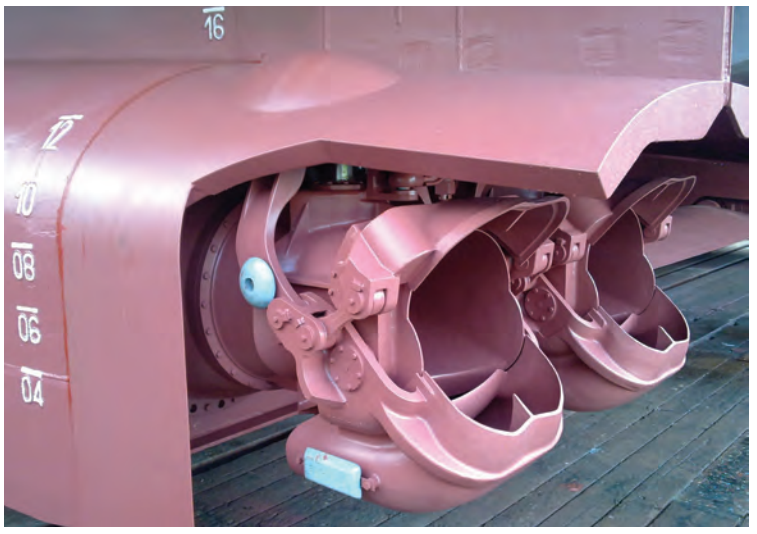
MAN L27/38 for Offshore Propulsion

Dubai-based Grandweld Shipyards has been appointed to build two Anchor Handling Tug Supply Vessels for undisclosed offshore operators. The AHTS newbuildings, will each be powered by two 8-cylinder MAN L27/38 main engines delivering a total of 2 x 2,720 kW in a standard twin screw propulsion layout for the drive of two ducted CP propellers. The calculated bollard pull is 90 ton. The engines for the vessels will be shipped from Denmark 2012, weeks 18 and 22 respectively. The L27/38 medium-speed propulsion engine is a popular workhorse for heavy-duty applications like offshore supply and service vessels, anchor handlers, tugs and workboats. The L27/38 is characterized by good performance over the entire load range, optimized for high-torque layout, dynamic behavior – good acceleration ability with invisible smoke from idling to full load, low fuel oil consumption and low NOx emissions.

Hornblower Hybrid Sails into NY Harbor

Hornblower Hybrid (pictured right), the first vessel powered by diesel, hydrogen, batteries, wind and solar energy, arrived in New York Harbor. After nearly two years of construction and the work of more than 300 individuals, the vessel will service New York City upon completion of United States Coast Guard sea trials and certifications. The innovative vessel reduces emissions, uses minimal diesel, and features several recycled and reclaimed materials, LEED-certified carpet and energy-efficient LED lighting. Marking its public debut, the Hybrid will participate in the Statue of Liberty's 125th Anniversary Flotilla on Oct. 28 at 10:30 to 11:30 a.m. from Pier 40 to the Statue. It will exhibit in the parade of ships in honor of the Statue's original dedication from France on Oct. 28, 1886. Next year, the Hybrid will run harbor cruises with close-up views of Ellis Island and the Statue of Liberty. "As a concessionaire to the National Park Service, we constantly strive to help conserve and protect the parks we serve," said Terry MacRae, CEO of Hornblower Cruises & Events.

Double Control for Waterjets



MJP Waterjets has combined steering and reversing of two jets simultaneously into a central column operating both jets in parallel by means of a single hydraulic control. This new design of the steering and reversing unit called CSUI has recently been tested on the French landing craft CNIM EDA-R. The landing craft with its hourglass shaped hull and has two very different operating conditions: Catamaran Mode and Barge Mode and thus called for specific design requirements. The vessel is equipped with four engines and four jets, which are driven by a MJP 650 mixed flow pump. As usual, the intake is adapted and designed to the constraints given by the hull and its application using CFD. The swath type hull with its pronounced hourglass shape results in a narrow waist at the waterline. The section below the waterline is made to an absolute minimum. During the design phase MJP have made use of CFD also to optimize the flow in the bucket to enhance the reversing performance. This is particularly important on a landing craft in order to ensure safe disembarkation from the beach. Sea trials have shown that the vessel is able to operate at the incredible speed of 10 knots in reverse at full load in open seas. In Catamaran Mode, the center platform is high above the waterline and the jets are consequently very deep in the water. When the center platform is lowered into Barge Mode, the jets are in a more common position. The design needs to fulfill the requirements for both operating conditions.

www.mjp.se

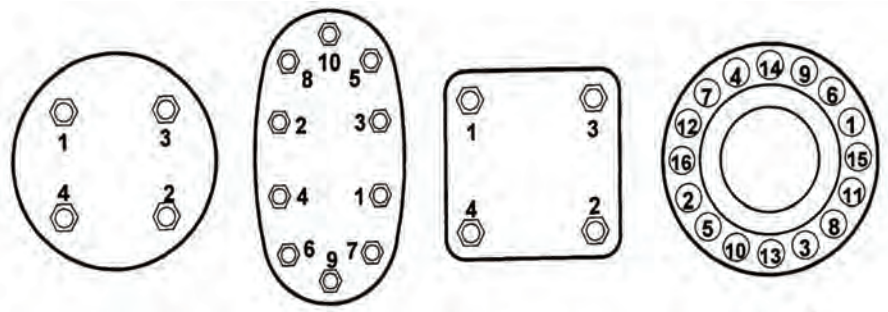
Marine Exhaust Systems: Special Sealing Challenges

Sealing exhaust systems is particularly important to the marine industry because of the temperatures, air volumes and noise levels associated with leaks. OEMs typically recommend graphite-filled, spiral-wound gaskets for use in the flanged piping connections of these high-temperature, low-pressure systems. However these gaskets are prone to failure due to loss of mass through oxidation of the graphite, high vibration levels and thermal expansion and contraction. Accordingly, gasket selection is an important part of ship maintenance and repair.

Gaskets are designed to accommodate vibration, thermal expansion and contraction, and a range of loading conditions. Most failures occur when gasket stress, or pre-load induced by tightening the flange bolts, falls below the range for which the gasket is designed. Following are the major factors that contribute to loss of gasket stress in marine exhaust systems.

Thermal cycling occurs throughout a ship's journey with weather, speed and fouling all impacting engine load. For example, bottom growth and fouling can cause a medium-speed diesel to reach temperatures of over 1,832°F (1,000°C). The expansion and contraction of flanges caused by such temperature spikes can loosen flanged joints and reduce gasket stress.

Bolting patterns and sequence for various flanges



Vibration also adversely affects gaskets, particularly in high-temperature systems. Graphite-based gaskets for high-temperature applications possess little organic content, which can burn off and create leak paths. However the absence of such elastic materials inhibits gasket recovery after compression. By contrast gaskets for lower temperature applications can be made of rubber, which due to its elasticity has excellent recovery properties. Unfortunately graphite lacks the recovery capabilities of an elastomeric gasket, making it more susceptible to loss of bolt load and gasket stress in high vibration systems.

Loss of gasket mass due to oxidation is another major concern. While graphite is ideal for use in non-oxidizing environments, marine exhaust is highly oxidizing. Graphite begins to oxidize at 850°F (450°C), which marine exhaust systems consistently exceed. The carbon in graphite gaskets combines with oxygen from the air to create CO and CO2., causing them to literally lose mass to the atmosphere. The rate of oxidation depends upon the temperature and amount of oxygen to which a gasket is exposed.

Upon installation a gasket is placed between two flanges and torqued to the recommended bolt load for sealing. As a gasket loses mass through oxidation, voids develop in the space between the flanges, decreasing bolt load and gasket stress.

The gasket is now held loosely in place and exposed to potentially high-velocity exhaust, a situation analogous to putting ashes on the dashboard of a moving car and opening the windows. As oxidation progresses, sealing performance degenerates until the gasket fails and exhaust escapes from the system.

TESTING

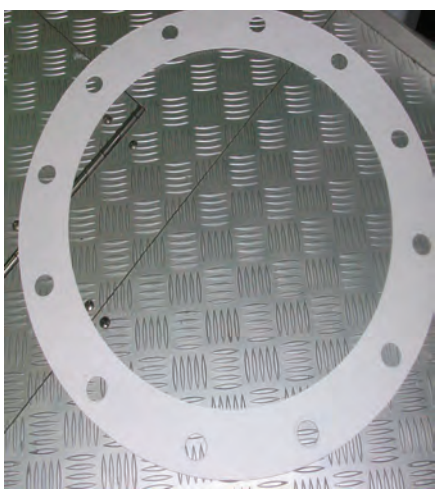
The purity and chemical doping of the graphite in a gasket will largely determine its performance at elevated temperatures. To measure its effect on rates of oxidation and loss of mass, two exfoliated graphite gaskets were placed in an oven at 1,000ºF (540ºC) for 17 days. The two gaskets were periodically removed, weighed on a Mettler scale and immediately returned to the oven. Even with its higher level of graphite purity and additives, the tang-core gasket still exhibited a sizeable loss of mass over an extremely short period of exposure.

GASKET SELECTION

A simple acronym, STAMP (size, temperature, application, media, pressure) can serve as a useful guide in selecting the right sealing solution for virtually any application. For large vessel exhaust systems, the two primary concerns are temperature and the parameters of the application itself. Of less concern are the media, just exhaust air, and pressure, which tends to be low in marine exhaust systems.

Temperature essentially dictates the type of gasket to be used. For temperatures below 850°F (450 oC) the material of choice is graphite, which offers good sealability and conforms to flange imperfections to prevent leak paths. The two most common types of graphite gaskets for marine exhaust systems are spiral-wound and tang-core-reinforced sheet, both of which are suitable for use below 850°F. Above this temperature, graphite gaskets should be avoided in favor of non-oxidizing, ceramic-based gaskets with low organic content.

With regard to application parameters, knowing the flange type, material and bolting information allows available gasket stress to be calculated, indicating the



The installation of reinforced ceramic sheet gasketing in the exhaust system of the 225-ft. (68.6m) yacht Attessa after spiral-wound graphite gaskets oxidized and caused leaks.

type of gasket to be used. Spiral-wound, reinforced sheet and corrugated metal gaskets are all available with various sealing elements and differ functionally in terms of required gasket stress to effect a seal and the maximum pressure the gasket is able to seal.

Made by winding alternating strips of metal and softer, more compressible filler materials, spiral-wound gaskets were developed to provide improved performance in high-pressure applications. The metal windings are made of various grades of carbon steel, stainless steel, nickel and titanium. The filler elements are usually graphite, ceramic or PTFE materials, and are based on the temperature and chemical resistance requirements of the application.

Graphite/stainless steel spiral-wound gaskets are suitable for marine exhaust systems, provided the available bolting and flange configuration can produce sufficient gasket stress. Minimum recommended stress for these gaskets is 10,000 psi, the highest of the three types under consideration.

Also suitable for marine exhaust systems are reinforced graphite and ceramic sheet gaskets. The reinforcement elements in these gaskets usually consist of various configurations of stainless steel foils, as well as tang and wire mesh inserts. Both sheet and corrugated metal gaskets require less bolt load than spiral-wound gaskets since there are no metal windings to be compressed. Minimum recommended stress for reinforced sheet gaskets is 5,000 psi.

Corrugated metal gaskets combine a metal core with a compressible sealing element. A variety of metals is available for the core, and either graphite, PTFE or ceramic-based materials may be used for the sealing elements. Corrugated metal gaskets conform to flange irregularities even under low bolt loads, and can be used when the space between the flanges will not accommodate a spiral-wound gasket. Minimum recommended stress for this type of gasket is 3,600 psi.

Gasket Type	Minimum Stress Recommendation
Spiral-wound	**10,000 psi**
Reinforced sheet	**5,000 psi**
Corrugated metal	**3,600 psi**

INSTALLATION

It is important to note that previously compressed gaskets, as evidenced by an imprint of the flange, should not be reused. Having been compressed, they will not recovery sufficiently, resulting in premature loss of bolt load. In addition the flange bolts should be well lubricated and flat washers hardened. Liquid or metal-based anti-stick and lubricating compounds should never be used on the gasket.

During installation the gasket should be compressed uniformly by first hand tightening the bolts, then going side to side on the flange, applying load to the bolts with a torque wrench (Figure 3). It is recommended that the bolts be tightened in one-third increments with the final pass at the target torque value made consecutively from bolt to bolt. A final check and re-torquing can be made 12 to 24 hours after installation.

CONCLUSION

Under certain circumstances, OEM-supplied graphite gaskets may be suitable in exhaust systems for new engines with limited vibration. However normal wear and tear over time can result in failure and leaking joints, the fumes and noise from which can adversely impact the safety and comfort of crew members and others. These leaks can be avoided by taking into account the state of the equipment and the operating conditions of the system when selecting the sealing solution. Limited temperature resistance and resiliency will effectively eliminate graphite from being used in systems that exceed its capabilities Graphite oxidizes at different rates, depending on its purity and the use of doping agents to inhibit oxidation. Testing demonstrated the susceptibility of graphite to oxidation at a relatively low temperature. These test results combined with actual failures of graphite gaskets in service indicate the need to consider alternative sealing materials such as ceramics to withstand the extreme temperatures in marine exhaust systems.

ABOUT THE AUTHOR

Wayne Evans is Product Development Engineer & Sherwin Damdar, Senior Product Engineer, Garlock Sealing Technologies

Goltens Breaks Ground at Dubai Maritime City

Goltens carried out a ground breaking ceremony of its new office and workshop facility in Dubai Maritime City (DMC) last month. The company has launched its business in the city, and laid the foundation stone for the construction of facilities dedicated to building and repairing ships. Goltens, which has a strong presence in the Middle East and across 21 locations around the globe, are under a long term Musataha ground development agreement with DMC for two plots within the DMC. The plots measuring about 23,000 sq. m. are leased to Goltens for a period of 25 years.

"Goltens is recognized for its reputation as a reliable, dependable and responsive provider of a wide variety of ship repair and mechanical services. The Middle East marine repair market is expected to grow significantly medium to long term and Goltens Dubai will for the foreseeable future be a large hub for the Middle East and we especially see a future growth within our specialist core disciplines Diesel, In Situ and Mechanical. Our commitment to our customers is not just to meet their expectation, but rather to exceed them by utilizing our global resources to continually deliver the highest quality standards to the international shipping community anywhere in the world", said Paul Friedberg, President – Goltens Worldwide Services.

The new Goltens Dubai facility will be twice the size compared to what the company has in Dubai today, with a footprint of 10000 sq. m. and an office block of 2000 sq. m. The workshop is a state of the art design with all thinkable modern equipment to serve the marine and industrial markets here in the Middle East, very similar to the other workshops we have built over the last 4 years in China, Rotterdam, Vietnam, Mumbai and Jeddah.

Wärtsilä: Catalytic Converters for Multipurpose Icebreakers

Wärtsilä was contracted by Finland-based Arctia Offshore Oy to carry out modification work to two of the company's vessels. The contract was signed in September 2011. The turnkey project involves the fitting of combined Wärtsilä NOx Reducer (NOR) and Oxidation Catalysts (OXI) to the MSV Fennica and MSV Nordica, both of which are multifunctional vessels based on a modified icebreaker design. The ships will also be converted to enable the use of Ultra Low Sulfur Diesel fuel. When this conversion work is completed, the vessels will fulfill the United States Environmental Protection Agency's (EPA) emission requirements for operating in the Arctic Ocean. This opens up the possibility for Arctia Offshore to participate in arctic oil exploration projects in an environmentally sustainable manner. The work will involve fitting the combined Wärtsilä NOR/OXI solution to each of the eight engines that drive the two vessels. The installation schedule is divided into two parts, with the first set scheduled for completion by the en d of December 2011, and the second set by the end of April 2012. The emission control device consists of a combined abatement system designed to reduce nitrogen oxides (NOx) and to enable the oxidation of carbon monoxide and unburned hydrocarbons. The NOR is a customized solution specifically engineered to meet the EPA's emission standards.

Teignbridge Expands Ops in Dubai

Teignbridge Propellers International announced plans to establish a 10,000 sq. ft. manufacturing base in Dubai to support its existing operation and tap into new markets. Headquartered in the UK, Teignbridge Propellers has had a Middle East presence for over 18 years – and already has an established service and repair centre in Dubai.

Chris Stokes, GM

Thordon Bearings Appoints Mill Log

Mill Log Marine of Burnaby, B.C. has been appointed the authorized Distributor in British Columbia for Canadian manufacturer, Thordon Bearings replacing W.L. Marine. With this agreement, Mill Log Marine becomes the stocking distributor for the world's largest manufacturer of non-metallic oil and grease free bearing systems.

Transocean Orders Thrusterscan

Kittiwake announced an order for its ThrusterSCAN product from Transocean. ThrusterSCAN is an online condition monitoring for azimuthing thrusters, helping to predict failure, enabling preventative maintenance and ultimately reducing costly downtime. Kittiwake's ThrusterSCAN will be installed on Transocean's eight-thruster Development Driller III rig.

BIMCO: Download the New EEDI Calculator

Development and verification testing is now completed for the first version of the BIMCO EEDI Calculator which is now ready for download from the BIMCO web site. BIMCO has developed the EEDI Calculator to assist its members calculating the EEDI and plotting a ship's index against the relevant ship type specific regulatory limits imposed by MARPOL Annex VI. The EEDI Calculator is an implementation of the calculation guideline contained in IMO Circular MEPC.1/Circ.681. The EEDI Calculator is available at: https://www.bimco.org/Products/EEDI.aspx

Navis: Chinese Language DP System

Finnish dynamic positioning systems manufacturer Navis Engineering has launched a Chinese language version of its NavDP4000 dynamic positioning system graphic user interface (GUI). The step has been taken in support of the increasing sales of Navis Engineering in China. As well as the GUI, the NavDP4000's voice alarms that the company believes represent a unique feature in the DP system market have been translated into Chinese, further enhancing safety.

www.navisincontrol.com

Dawning of the *Age of Aquarius*

A modern approach towards using renewable energy on ships

By Greg Atkinson, Director, Eco Marine Power. Pty Ltd.

In 1819 the SS Savannah was the first steamship to cross the Atlantic Ocean, however most of the distance covered during that historic voyage was due to sail power. The steam engines were fitted to act as a secondary propulsion source and designed to be used only when there wasn't enough wind present for the sails to move the vessel.

In the century that followed, engine power and wind power worked alongside each other to move the ships that carried trade across the globe. As engines became more powerful and efficient they became the primary propulsion source for shipping and by the 1920's, sails had all but vanished from large commercial ships.

Now in the second decade of the 21st century, sail power is once again being looked at as a source of propulsion for commercial vessels as the shipping sector adjusts to emission reduction targets and the need to reduce fuel costs.

In addition, recent advances in solar cell technology mean it is also feasible to install sizable solar power systems on-board ships and therefore it seems only logical to try and combine wind & solar power into one solution.

The Aquarius wind & solar power system (Patent Pending) that is being developed by Eco Marine Power (EMP) of Japan is a marine power solution that combines wind and solar power. However unlike the ships of old, the rigid but moveable sails of the Aquarius system are not intended to be the primary source of propulsion on-board large ships, but instead are designed to harness the power of the wind and sun in order to reduce fuel consumption.

Less fuel consumed also means less harmful emissions are released into the atmosphere and in addition, the carbon footprint of the vessel is also reduced.

The sails used by the Aquarius system will be fitted with marine grade solar modules and this will enable them to not only utilize the power of the wind but tap into the power of the sun as well. An array of up to 20 of these sails could be installed on a ship and it is expected that this combined solar & wind solution would deliver annual fuel savings of up to 20% on large ships such as Capesize bulk carriers.

(Photo Courtesy: Eco Marine Power Co. Ltd.)

Impression of the eco solar ferry concept Medaka. The solar panels mounted on the roof are used to recharge batteries to help reduce fuel consumption and noxious gas emissions.

Aquarius also includes an advanced computer control system which will position the sail panels to make the best use of the available wind or position them to collect solar energy when there is little or no wind.

However the Aquarius system is not simply an array of solar panels that also act as sails. Aquarius also includes an advanced computer control system which will position the sail panels to make the best use of the available wind or position them to collect solar energy when there is little or no wind. In addition the control system includes a range of safety features which will for example; automatically lower the sail panels when very strong winds are detected.

When lowered the sails are stored in a protective housing which will prevent them for being damaged during storms or when the ship is loading/unloading cargo.

The control system will also allow the crew to manually position the sail panels via a command console if required and will also monitor the performance of the entire system.

Eco Marine Power has also designed the Aquarius system so that it can be used while the ship is at anchor or in port which is a major advantage over solutions that are focused on wind power alone. This achieved by using the sails as solar energy collectors with each rigid sail positioned by the computer control system to best use the available sun.

The solar energy collected by the solar panels can either be fed into the ships main power supply or stored in Lithium battery modules. The major advantage of storing the energy in batteries is that it can be used when the ship is in port, thus providing a source of emission free power. This will become an increasing important feature as ports around the world implement strict emission guidelines for vessels using their facilities.

On a large ship the solar power component of the Aquarius system could be up to 500kW and as solar cell technology advances, it will become more practical and cost effective to increase the capacity of the solar power system even further.

A fairly simple sail design will be used for the prototype, but work is currently underway to develop a more advanced solar sail panel which will be used on the commercial system.

So will the Aquarius wind & solar power system work? The simple answer is yes, as the basic concept of using rigid sails to reduce fuel consumption has already been evaluated.

During the 1970's and 1980's in response to the oil crisis, two ships in Japan: the Shin Aitoku Maru and the bulk carrier Usuki Pioneer were fitted with rigid sails. These vessels proved that a significant reduction in fuel consumption could be achieved through the use of rigid sails on-board modern commercial vessels. However when oil prices fell, further development work on these rigid sail concepts ended.

Today new materials and manufacturing techniques enable rigid sails be more robust, lighter and less costly than those trialled in the past. Combine those factors with a computer control system plus Lithium battery technology and the result is the Aquarius system - a cost effective fuel saving & emission reduction solution for the shipping sector.

Initially the focus has been to design the Aquarius system for use on bulk carriers (bulkers) and oil tankers, but Eco Marine Power is currently working on a variation of the system that could be used on smaller ships and government vessels.

Testing of a prototype Aquarius system is due to commence in Japan during 2012. For more information please visit the Aquarius System webpage:

http://www.ecomarinepower.com/en/aquarius-wind-a-solar-power

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Fostering a culture of blame at sea.

When Near Misses Become Casualties – or not...

by Joe Keefe, posted October 5, 2011

My good friend, Captain Tom Hudson, an Operations Superintendent with Mitsui O.S.K. Bulk Shipping (USA) Inc. gave me a call to discuss something that had been bothering him for quite some time. He referred me to a "near-miss" situation that occurred on one his tankers over the summer; one which has now taken on heightened meaning for all ships traveling in U.S. waters because of how the event has been interpreted by local Coast Guard officials. Almost three months later, Hudson has been on a one-man campaign to make right what he believes goes much deeper than a single (near) mishap. From where I sit, it is a cause worth fighting for. Here's why:

Near Miss – Another Day at Sea…

On 10 July in the Bayport Channel, one of Hudson's ships experienced what he characterized as "a bank sheer." Also according to Hudson, the ship was successful in regaining control and there was no damage, injury or potential to damage the environment. The "near miss" was recognized and the vessel gathered all available information from the incident for a review by the office. Hudson learned about the event approximately two hours after it happened. Although MOL routinely looks at all "near misses" internally to make sure that they do not happen again, Hudson saw no reason to notify the Coast Guard, but did so anyway, primarily to cover all the bases. A few hours after the agent's call, the local Coast Guard Sector's Investigation Department visited the ship. They picked up the information from the ship, took statements and assisted the Captain with the 2692. At that time there was no mention of any need for further material from the ship – indeed, 10 weeks later, also according to Hudson - there still has been no effort to obtain further information from the ship, pilot or tugs.) Prior to vessel's departure, Hudson visited the ship and obtained copies of all information related to the event, primarily to prepare a presentation to use the value of the near miss as a tool to understand the event.

Later, however, when the ship left the dock, the Coast Guard Investigator notified the ship to go to anchor and await clearance. After several hours at anchor, Hudson learned that the ship was delayed for a "needed" Class report. The internal inspection done by the Chief Officer was not sufficient proof of the vessel's safety for the purposes of the Coast Guard. Beyond this, Hudson was incredulous to discover that the ship had been fined $250 for running aground and had been further fined $5,000 for late notice. The vessel lost a half day's hire (> $10,000) and the charterer probably a good deal more. A Class report did not provide any additional information. And, after incurring the cost of divers and an extensive internal investigation, there has yet to be any indication that the vessel ever touched bottom.

Casualty Reporting

Plans to expand what can be interpreted to be a "Marine Casualty" are said to be underway, with that enhanced reporting requirement to come as early as January of 2012. Reportedly, any event listed in 46CFR4.03-1 (as examples of what might cause a casualty) must be reported. Where it is apparently heading is that every tripped circuit breaker and/or false alarm bell must now be reported promptly to the Coast Guard. Hudson told *MarPro*, however, "I am in complete agreement that near misses must be studied by the ship (and management) to prevent casualties in the future. However, I do not think the intent of Congress enacting 46 U.S.C. 6101 to devote the resources needed to record all possible events that might lead to a casualty. I believe that an incident must first be a casualty, before one decides if it is a 'marine' casualty. And if it is not a casualty (so not a marine casualty), there is no requirement for a report." But, in this case, the rapidly festering problem goes much deeper.

The Culture of Blame

In the second quarter print edition of Maritime Professional magazine, the value of Quality Audits is discussed in depth, with the ultimate message that "Quality Audits Matter," and an explanation of why you should care. In the article, it is explained that "…management welcomes the audit findings. They encourage internal and external auditors to provide findings which could be useful for improving company processes. Such managers do not discourage staff when non-conformities are reported, as those findings are considered tools for improvement or opportunities for growth." That's well said and good advice.

Looking back at our "near miss" on the Houston Ship Channel, and using the above logic, this was certainly an opportunity for improvement and/or growth. Instead, it has been turned into an event which shipboard personnel and office workers alike will long remember: even if nothing tangible happens, we're still in trouble. And, in that scenario, the likelihood of future "near misses" being reported to the authorities or even internal supervisors is reduced to two possibilities: slim and none. Quality Audit professionals call this deadly cycle the "Culture of Blame." That's because it goes counter to virtually every principle of good ship safety management.

So, on July 10th, two appropriately credentialed and experienced marine professionals – the harbor pilot and the ship's Master – teamed up to move a large, deep draft tanker up the channel to safely moor it alongside the intended berth. Eventually, that's exactly what happened. Along the way, the job got a little harder when the ship apparently did not handle as intended, but the folks charged with driving the boat adjusted their methods and because they were skilled mariners, the end result was a good one. That's the way it is supposed to be and that's why they get paid well.

When a Near-Miss Becomes a Casualty

A look back is a good thing. Did this, as the quality auditor might say, involve a non-conformity? I don't think so. What it did entail is an event in which a potentially destructive result was averted and the methods employed to do that ought to be widely disseminated for all to see. At the same time, the events leading up to the point where this situation manifested itself need to be similarly examined to determine what and if happened to put the vessel into an "iffy" situation. That shouldn't involve fines and penalties.

How this event got the point of becoming a punitive police action by the nation's top marine watchdogs is beyond me. **But, it brings us back to the realization that the U.S. Coast Guard, as much as five years ago realized that it had lost its edge in terms of marine inspection and technical skills. A concerted effort is underway to right that ship and bring the Coast Guard's marine safety mission back up to a reasonable standard.** This includes, among other things, enhanced training at so-called "centers of excellence" and the active recruitment of experienced commercial mariners and other civilian marine professionals into the Coast Guard to shore up a mission that had lost its way. That said; events like the one described by Captain Hudson in July do not necessarily provide any measure of comfort that improvements are happening.

The same organization that routinely sub-contracts important inspection duties to certain, appropriately qualified classification societies also should be able to take those same folks at their word when they say that a vessel is in compliance with no apparent damages or evidence that anything untoward has occurred. And, that's just what has happened. In the wake of all that, no fines have ever been collected by the Coast Guard and the initial penalties – according to Hudson – have since been reduced to letters of warning. Still, the delays and expenses incurred by the vessel, its operator and charterers were needless.

On July 10th of this year, no damage to any ship or facility occurred in the port of Houston or Bayport. No oil was spilled and no one was injured. No hulls got dented and no anti-fouling paint got scraped against a murky bottom. Nevertheless, a responsible operator and its technical personnel are examining an anomaly that occurred during a channel passage with the ultimate goal of making an already safe vessel – and fleet – even better. They even let the local authorities know of their efforts in a reasonably timely manner. And, that's the way it should be. Period.

Containerships

"Top 3" Driving Rates into the Seabed

by Greg Knowler, Hong Kong,
Posted October 26, 2011

Looking at the container shipping rates, it seems that for a carrier to even achieve zero rate would be an improvement. The bunker adjustment factors being charged are more than the rate per TEU, which means the lines are paying shippers to transport their cargo.

That's very generous of carriers that are known more for extracting blood from stones than for their philanthropy.

The bargain basement rates, of course, are not an early Christmas present to shippers. They are the result of a price war being waged by the top three carriers, Maersk Line, MSC and CMA CGM. Even OOCL financial boss Ken Cambie criticized the practice in Hong Kong last week during an operational update. He told reporters that the three big carrier's chase for market share was impacting freight rates.

What is going on in the Asia-Europe trade? Freight rates have fallen to "sell the ships and let's just go home" levels

With demand way down, the only way for rates to improve is if capacity is withdrawn from the Asia-Europe trade. But instead of taking ships out, the top three carriers are leaving capacity in service or adding new vessels to the trade. The shipping companies are so large that they can withstand the losses being accumulated in the bloody price war that some have suggested is a way to force smaller lines out of business.

That may be the big three's strategy, but you have to wonder who will blink first. It was the headlong and mindless rush for market share that saw the lines pushed to the brink in 2009, and here we go again.

You also have to wonder whether the market would be better served by a diverse collection of carriers rather than being concentrated in the hands of a small number of lines. The bigger the carrier, the less the flexibility and the more impersonal the service.

But ultimately, cost and reliability are the two factors that matter to shippers. If a carrier doesn't charge too much and the goods are delivered intact and on time, it doesn't matter whether the shipping line has 10 ships or 1,000.

That reliability is what the Daily Maersk service that started officially on Monday is offering, but with so much space and low rates available there is plenty of choice available to shippers.

'Leggo' Workboats to Service Windfarm

By George Backwell, Thailand,
Posted October 28, 2011

U.K. offshore wind farm 'London Array' will be the world's largest when its 175 wind turbines, each around 147 m tall, start feeding their 630 MW (via two offshore sub-stations) into the national grid by the end of next year. Part of a fleet of work boats servicing this wet-footed generating station located in the waters of the outer River Thames estuary will be from Brightlingsea based builder CTruk Boats who recently announced the delivery of the first of three multi-purpose catamaran work boats contracted by windfarm project leaders Siemens. This first boat, CWind Alliance was delivered last week to skipper/owner Andy Harman in home port Ramsgate and features an innovative 'flexible pod' construction, an entry shortlisted in the Sea Work 2011 'Innovation Showcase' international competition.' Ben Simpson, Managing Director of CTruk Boats explains the modular flexible pod concept: "Our design team knew there was scope to improve the types of work boats supporting the growing wind farm industry whilst keeping the safety aspect of offshore work at the forefront of the design." The modular, flexible pod build enables operators themselves to change the vessel's layout within a few hours to suit the work of the day.

Not Smooth Sailing for SCI

SCI's losses compel it to cut down on its acquisition program

By Joseph Fonseca, Mumbai,
Posted October 19, 2011

Two weeks after its Golden Jubilee celebrations of October 1, 2011 in Mumbai, the state-owned Shipping Corporation of India Ltd. (SCI) accepted delivery of a 80 T BP Anchor Handling, Towing & Supply vessel "m.v. SCI Ratna." But the glitter of the anniversary celebrations nor its present on-going acquisitions in any way indicate that it is all that hunky dory for SCI in its 50th year, after its scintillating growth trajectory it displayed in the past few years despite the global economic downturn.

In fact SCI has cancelled plans to buy three new containerships. Besides the company has reported losses in the past two quarters. This has sent signals that India's biggest ocean carrier is treading cautiously in its expansion plans as the global oversupply of ships, low freight rates and rising costs hit margins of fleet owners.

SCI had signed contracts for acquisition of four new-buildings 80 T BP Anchor Handling, Towing & Supply vessels with Bharati Shipyard Limited, India. The first vessel, "m.v. SCI Panna" was delivered to SCI on 23rd August, 2011 and the remaining two vessels are scheduled for delivery by the end of 2011.

The new acquisition has a gross tonnage of 2,039 tonnes and deadweight of 1,983 tonnes. The vessel which is classed with the Indian Register of Shipping is equipped with DP I system and has been built to comply with the latest and most stringent international regulations.

In the offshore sector, SCI presently has a fleet of 12 vessels of which 10 vessels were acquired during the eighties. These vessels have been dedicatedly serving the oil exploration and production sector in India for the last 25 years. The four AHTSVs ordered with Bharati Shipyard are 1st phase replacement of SCI's 10 AHTSVs & comply with superior specifications like Dynamic Positioning, Reverse Osmosis Plant and UKOOA compliance as required by Indian E&P operators, etc.

As a National carrier, SCI has been aiming to increase its presence in India's offshore sector. To promote Indian Shipbuilding industry, SCI has ordered four AHTSVs of 120 BP capacity and two PSVs with Cochin Shipyard on nomination basis.

MARITIME REPORTER AND ENGINEERING NEWS

2012 Editorial Calendar

The worldwide source for essential maritime news - since 1939

January	Ad Close: Dec 22	February	Ad Close: Jan 26	March	Ad Close: Feb 23
US Navy Report		**Cruise Shipping Annual**		**The Ship Repair Edition**	
Market: Floating Production Systems		Market: Ports & Logistics		Market:Training & Education: Facilities & Systems	
Technical: Ballast Water Treatment Systems		**ROUNDTABLE:** Satellite Communications		Technical: Software Solutions	
Directory: Marine Propulsion Equipment		Directory: Marine Electronics Buyer's Guide		Directory: Coatings & Corrosion Control	
		Special Report: Germany			
ASNE Day Feb 9-10		**Seatrade** Mar 12-15		**CMA** Mar 19-21 **CIMPS-Europort** April 25-27	
April	**Ad Close: Mar 22**	**May**	**Ad Close: April 26**	**June**	**Ad Close: May 24**
Offshore Deepwater Annual		**The Green Ship Edition**		**Annual World Yearbook**	
Market: Offshore Wind & Renewable Energy		Market: Patrol, Escort Craft & RIBs		Market: Military Might: Innovative Designs	
Technical: Offshore Service Vessels		Technical: The Integrated Bridge: Modern Bridge Technology & Technique		**ROUNDTABLE**: Information Technology & Software Solutions	
Directory: Deck Machinery, Winches & Ropes		Directory: Posidonia 2012 Preview: New Technology Guide		Directory: Maritime Fuels, Lubricants & Additives	
Special Report: The Netherlands		Special Report: Middle East Maritime Cluster			
OTC April 30 - May 3		**RoRo** May 22-24 **MACC** June **Posidonia** June 4-8		**Don Sutherland Photo Contest**	
July	**Ad Close: June 2**	**August**	**Ad Close: July 26**	**September**	**Ad Close: Aug 23**
Arctic Operations		**The Shipyard Edition**		**Marine Propulsion Annual**	
Market: Oil Spill Response & Recovery		Market: Maritime Communications		**ROUNDTABLE:** Diesel Engine Manufacturers	
ROUNDTABLE: Coatings & Corrosion		Technical: Maritime & Shipbuilding Tools		Technical: Marine Salvage & Recovery	
Directory: Training & Education – Facilities & Systems		Directory: SMM 2012 Preview: New Products & Technologies		Directory: Insulation, Pipes, Pumps & Valves	
Special Report: Brazil		Special Report: Singapore Maritime Cluster			
		SMM Sept 4-7		**Rio Oil & Gas** Sept 17-20	
October	**Ad Close: Sept 20**	**November**	**Ad Close: Oct 25**	**December**	**Ad Close: Nov 22**
Marine Design & Construction		**Workboat Annual**		**Great Ships of 2012**	
Market: Maritime, Port & Harbor Security		Market: Offshore Service Vessels (OSVs)		Market: Port & Harbor Dredging Annual	
Technical: Deepwater Floating Production Systems		**ROUNDTABLE:** Workboat Academy: Training & Education		Technical: Maritime Fire & Safety Products & Systems	
Directory:CAD/CAM & Other Software		Directory:Heavy Lifting: Deck Machinery & Cranes		Directory: World Shipyards: Newbuild, Repair & Conversion	
		Special Report:Turkey			
SNAME Oct 24-26 **MAST Americas** Nov 14-16 **Inmex China** Nov 21-23		**Int'l Workboat Show** Dec 5-7		* Please note that the publisher reserves the right to alter this editorial calendar. All planned features are subject to change in light of changing industry trends and developments.	

PrimeShip-HULL(DSA)/ Guideline for Containers

PrimeShip-HULL(DSA)/Guideline for Containers (Ver.2.0.0) is software designed to perform the direct calculations defined in the revised Guidelines. Using an FE model, users can easily execute complicated FEM analyses through the use of special features such as the automatic identification of structural members and compartments. This revised version of the software not only incorporates all of the revisions of the new guidelines, it also includes a handy user assistance function to guide users through the entire operation process. This software is provided free of charge to shipyards and designers who plan to perform structural assessments based on the Guideline. Applications for the software should be made to the ClassNK Hull Department.

Massive Orders for Noreq


Styrk Bekkenes

Noreq won several major contracts with Asian yards, including the contract for lifeboat packages for Maersk drillships being built with Samsung Heavy Industries in Korea. At Jurong Shipyard in Singapore, Noreq won the lifesaving package for eight plus six optional Jack Up rigs they are building for Seadrill and Noble Drilling. Another Singaporean yard choosing Noreq equipment for new buildings is Keppel Fels Singapore, which ordered life- and rescue boat packages for two rigs they are building for Discovery Offshore SA. Not only for Rig and drillship vessels have the recent weeks been good. Noreq has also received orders of 20 packages of rescue vessels and belonging davits.

www.noreq.no

Transas ECDIS Retrofit Order for BSM

Transas Marine was chosen by Telaccount Overseas Ltd. as a partner for ECDIS retrofit program for Bernard Schulte Shipmanagement (BSM). BSM is a global leader in quality Shipmanagement with 320 vessel under technical management and additional 300 under crewing management.

According to agreement, Transas Marine will supply its Navi-Sailor ECDIS 4000 Multifunction Display system with numerous additional options, like recently launched Transas Bridge Link (firewall system) and Admiralty Information Overlay with T&P Notices.

www.transas.com

GD: $429m Sub Work

The U.S. Navy awarded a $429m contract modification to General Dynamics Electric Boat to provide planning yard work, engineering and technical support for nuclear submarines. Electric Boat is a subsidiary of General Dynamics.

Alion Wins $169.7M Deal

Alion Science and Technology won a contract to support the Navy's Amphibious Warfare Program Office in their efforts to satisfy both current and future Navy/Marine Corps needs for Amphibious Warfare. Alion's efforts include supporting the acquisition and production of the Navy's LHA (R) class and their next generation connector, Ship to Shore Connector (SSC). Alion will also support the Service Life Extension Program (SLEP) of their current Connector, the Landing Craft, Air Cushion (LCAC).

Keppel Appoints CFO

The Board of Directors of Keppel Corporation Limited said that Teo Soon Hoe will relinquish his role as Group Finance Director with effect from January 1,2012. Teo, 62, will continue to serve as Senior Executive Director and remain on the Keppel Board. He will remain as Chairman on the boards of Keppel Telecommunications & Transportation Ltd and M1 Limited. He will assist the CEO, Mr Choo Chiau Beng to strategize and grow Keppel's competencies in Sustainable Development, and oversee Keppel's investment portfolio and special projects such as the Sino-Singapore Tianjin Eco-City. The Board appointed Loh Chin Hua, Managing Director of Keppel Land's real estate fund management arm, Alpha Investment Partners Limited, as Chief Financial Officer with effect from January 1, 2012.

New President at US Fab

Kevin Quigley was named president of VIGOR's US Fab division. Quigley will oversee all of VIGOR's new ship construction including ferries, advanced Coast Guard cutters, barges, fishing and cargo vessels. As US Fab president, he also will direct the company's growing land-based and alternative energy fabrication projects.

New MD BMT Singapore

BMT Asia Pacific Pte Ltd, a subsidiary of the BMT Group, appointed Per Røed as its Managing Director. He as formerly Head of Vessel Newbuilding at AP Moller–Maersk in Singapore.

Schottel Promotes Bull

Andrew Bull was appointed managing director of SCHOTTEL Middle East FZE in Dubai. He is responsible for all sales and service activities in the Middle East region.

Comark Promotes Smudin

Comark named Rick Smudin as the Director of Military and Marine Sales, responsible for all aspects of Military and Marine sales, globally. He brings 20 years of technical sales experience in the computer hardware, software and embedded markets.

Kvaerner Appoints Allen

Kvaerner appointed Tony Allen as Executive Vice President for its International business area. Allen has more than 30 years of industry experience and has been part of the corporate management with several of the leading EPC contractors for the oil and gas industry, including SNC-Lavalin Inc., Humphries & Glasgow and Earl and Wright.

Thuraya Appoints CFO

Thuraya appointed Patrick Chenel as CFO. In addition to leading Thuraya's financial management, planning and reporting functions, he will also be responsible for maintaining and developing the Company's relationships with the relevant financial institutions and strategic suppliers across the globe.

Global Diving & Salvage Promotes Daily

Global Diving & Salvage, Inc. promoted Deirdre Daily to General Manager of the Alaska Region. "During her tenure at Global Diving, Deirdre has continued to show great aptitude in management capabilities" says David DeVilbiss, Alaska Regional Manager.

Carver to Lead Veson Nautical Singapore Office

Veson Nautical is expanding its team in Singapore, and it doing so it named John Carver as the new Regional Manager; Asia Pacific Region.

Sea Tel Hires Insall

Sea Tel hired Chris Insall as the Manager, Commercial Programs, responsible for new business development. He will be based in the UK and will work from the Cobham Leatherhead office.

APL Appoints North Asia Regional Head

APL announced the appointment of Wong Siew Loong as Regional President of its North Asia business. "Siew Loong brings with him 15 years of experience within the company. I am confident he is the right person to steer our North Asia business, an integral part of APL's global liner activities.

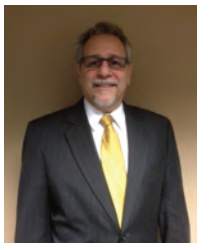
DnB NOR Asia Energy Team Expands

Omar Sekkat has joined DnB NOR's energy division at the bank's Asian headquarters in Singapore. He comes to the role after transferring from DnB NOR in London.

AKD Appoints Kromhout

Netherlands law firm AKD has appointed Jan Kromhout as a partner in its shipping and offshore team. He began his career in Rotterdam with the law firm Nauta Dutilh.

Caravello Joins Rainmaker



Jack Caravello has joined Rainmaker LLC as Vice President of Business Development, bringing with him more than 37 years of experience in Maritime and Offshore Industries.

Linge to Head Senergy Oslo

Senergy reinforced its Norwegian footprint by opening new business premises in Oslo. The company also appointed Frode Linge, to head up its new regional office as project/asset manager.

www.senergyworld.com

Heaselden New Director

The Shipowners' Club, the mutual P&I insurer specializing in small and specialist vessels has appointed David Heaselden to the new post of Loss Prevention Director, with immediate effect.

MMS Picks Globe iFusion

Globe Wireless said Marine Management Services (MMS) of Piraeus, Greece has selected the Globe iFusion as the communication solution for its fleet. Globe iFusion incorporates an Inmarsat

(continued on page 96)

Hapag-Lloyd Celebrates East Asia to Australia Milestone

In 1886, the up-and-coming German economy needed regular liner services connecting it with the new growth markets, in addition to efficient postal services around the world. To this end, the German Reich provided subsidies for the first Reichspost steamship liner services to East Asia and Australia totaling five million German mark annually with the aim of quite literally flying the flag in regions important for future growth. The contractually required standards that the shipping companies had to satisfy were thus correspondingly high: first-rate vessels, sailings every four weeks, high average rate of speed and, of course, Prussian punctuality. By today's standards, the Reichspost steamships seem comparatively small: the Oder of Norddeutscher Lloyd, one of the founding companies of Hapag-Lloyd, was approximately 107 m long, 3,158 GRT in size, could carry 770 passengers and had a freight capacity of 1,600 tons. Nonetheless, when on 30 June 1886 the Oder set sail from Bremerhaven on its first ever service to East Asia, the Chinese ambassador was there in person to mark the occasion. The Salier, which began service for the Australia route on 14 July, had similar dimensions. By way of comparison, the Tsingtao Express, currently serving Hapag-Lloyd's Europe–East Asia route, is 335 m long, has a capacity of up to 104,000 tonnes and can carry 8,750 standard containers.

With sailings every four weeks the steamships leaving from Bremerhaven served ports such as Suez, Aden, Colombo, Singapore, Hong Kong and Shanghai in the Far East and Adelaide, Melbourne and Sydney in Australia. Feeder services were then available from Hong Kong to Japan (Yokohama, Nagasaki and Hyogo) as well as from Sydney to Samoa and Tonga. Other European ports were also served – Antwerp and Southampton, for example. Even in those days, cargoes bound for Asia and Australia were mainly industrial goods and, on the return journey to Europe, mainly commodities. Hapag, the second founding company of Hapag-Lloyd, began cooperating with Norddeutscher Lloyd at the turn of the century on the Reichspost steamship services to improve cost-efficiency, with the companies coordinating their sailing schedules as well.

To this day, as for over 125 years, East Asia is still one of Hapag-Lloyd's most important trading routes. For decades it has always been served by the largest and most modern ships in the Company's fleet. The ten new 13,200-TEU Hapag-Lloyd ships that are to be taken into service between June 2012 and the end of 2013 will also link Europe and East Asia. "With the vessels in this new size class we are continuing what we started 125 years ago: connecting Europe with the growth regions of the future in East Asia via fast and reliable liner services," says Michael Behrendt, Chairman of the Executive Board of Hapag-Lloyd AG. "We are very proud of the long partnership between Hapag-Lloyd and its customers in East Asia – an economic area with great significance, strong growth and excellent perspectives."

What began 125 years ago has grown into an extensive network of around 40 Hapag-Lloyd services to East Asia and Australia/New Zealand (from and to Europe and transpacific). In all, Hapag-Lloyd today links more than 160 ports on all continents directly with over 140 container vessels on around 80 services.

Hapag used Far Eastern motifs to advertise its East Asia services.

FleetBroadband 250, a dual firewall, highly optimized IP connections and multiple least cost route gateways, allowing the user to make voice calls using GSM, send and receive email, and browse the Internet.

www.globewireless.com

Cargotec Gets China Deal

Cargotec confirmed a contract worth around EUR 25 million from a Chinese shipyard to deliver 104 MacGregor cargo handling cranes for 26 Bulk carriers.

www.cargotec.com

ABS Nautical Systems Expands in Cruise Market

ABS Nautical Systems was selected as the asset management software provider for Star Clippers, based in Monaco. Star Clippers will implement the Maintenance & Repair, Purchasing & Inventory and Crew Management modules, as well as the accounts payable and purchasing accrual interfaces from ABS Nautical Systems' software suite NS5.

Sener in Renewable Energy Project

Sener Ingeniería y Sistemas, S.A. is one of the companies participating in the CENIT-E OCEAN LIDER Project, led by Iberdrola. The Project is a technological initiative promoted by a consortium of companies with strong research capacity facing the challenge of generating knowledge for the efficient exploitation of the oceanic renewable resources. SENER is going to investigate in two of the five Activities within the Project.

Transocean Opens Kuala Lumpur Training Center

Transocean opened its state-of-the-art training center and offices in Kuala Lumpur, Malaysia. The training center and offices were opened by Dato' Wee Yiaw Hin, Executive Vice President, Exploration and Production, of PETRONAS, and Steven L. Newman, President and Chief Executive Officer of Transocean.

St. Johns Ship Building to Build Skanska Barge

St. Johns Ship Building won a contract to construct a custom crane spud barge for Skanska, one of the largest construction companies in the world. This is the first contract St. Johns has signed with Skanska USA, a leading national construction company with 7,000 employees in the U.S. and 2010 revenues of $4.8 billion. The vessel will initially be outfitted with a Liebherr LR1300 330 ton crane and will support the Pier 5 expansion project in Norfolk Va.

Saipem Wins $1.5B E&C Offshore Contracts

In Iraq, Saipem was awarded by South Oil Company the EPIC contract for the Iraq Crude Oil Export Expansion Project – Phase 2, within the framework of the expansion of the Basra Oil Terminal off the Al Faw Peninsula in the Arabian Gulf, approximately 550 km south-east of Baghdad. The contract encompasses the engineering, procurement, fabrication and installation of a Central Metering and Manifold Platform (CMMP), to be installed in a water depth of 28 m, along with associated facilities. In Nigeria, Saipem has been awarded the OFON2 - D030 contract by Total E&P Nigeria Limited, for new offshore facilities in the Ofon field, about 50 km off the southern

coast of Nigeria. Saipem will carry out the engineering, procurement, fabrication and installation of the OFP2 Jacket (comprising the 1,970 ton jacket structures and the 4,500 ton piles), as well as the transportation and installation of the complete new OFQ living quarter offshore platform. Also, Saipem has been awarded contracts in the Norwegian and British sectors of the North Sea and in the Gulf of Mexico, mainly based on deployment of the Saipem 7000 vessel, for the transportation and installation of platforms and marine facilities, along with the decommissioning of existing offshore structures.

Transas Simulator in Australian College

An installation of Transas GMDSS Simulator TGS 5000 has been completed in the Australian Maritime College (Launceston). Supplied, installed and supported by Transas partner Electrotech Australia, the system is designed to provide flexible teaching arrangements for classes of up to 24 students through the utilization of two instructor stations interfaced to 15 student stations. The system complies with STCW 2010 Code and IMO Model Course 1.25 and is type-approved by DNV.

www.transas.com

Nobeltec, Taylor Marine Announce Partnership

Nobeltec announced a new partnership with Taylor Marine of Australia. As of October 1, 2011, Taylor Marine, also known as JN Taylor & Co. Ltd., will act as Nobeltec's exclusive distributor of all Nobeltec products sold to dealers and end users in Australia.

Kuang Ming Picks AMOS

Hong Kong based SpecTec Asia Pacific East Ltd has entered into an agreement to supply SpecTec AMOS software and related services to Kuang Ming Shipping Corp. head office and its 14 bulk cargo ships. Kuang Ming currently operates in dry bulk cargo service worldwide with its 14 bulk fleet. It is scheduled to have a bulk fleet of more than 20 vessels by 2013.

MSC: Backlog to Continue into 2012

Maritime Services Corporation (MSC), a marine interior company specializing in turnkey installations, reports that it has a backlog of contracts exceeding $10.5m in value for assignments to be completed this November through March.

A $6 million contract with Princess Cruise Lines is now in fabrication at the company headquarters in Hood River, Oregon for the Sapphire Princess. In addition, MSC will begin modifications on two dinner vessels next month for Portland Spirit in Portland, Oregon. Those jobs will also be complete in January.

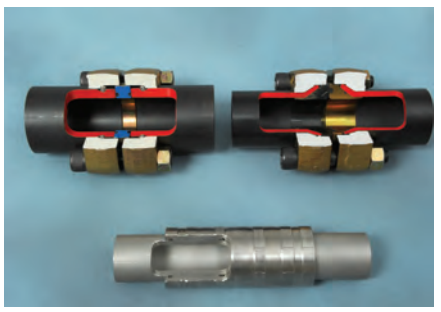
MSC's Southampton, U.K. office will begin in November a $1.4 million refurbishment contract in Hamburg, Germany for Carnival, U.K. on the Oriana. Also next month, MSC U.K. will begin a $540,000 refit on the Star Princess in Trieste, Italy. **www.mscor.com**

Maersk Uses Emsys for USN Biofuel Trials

WRSystems supplied its Emsys laser-based Emissions Monitoring System (EMS) for the emission verification for an ongoing fuel trials on-board the AP Moller-Maersk vessel Maersk Kalmar. It was asked to provide the Emsys system installation as part of a wider project between Maersk Line Limited (Maersk) and the US Navy to test biofuels for their long-term suitability for maritime applications. Emsys was requested by Maersk following a trial installations on two U.S.-based Maersk container vessels. The system will collect comprehensive emissions and Particulate Matter (PM) data. This data will be included in a performance report to be prepared by Maersk and audited by Lloyds Register (LR). Data collected will include Nitrogen Oxides (NOX), Sulfur Oxides (SOX), Carbon Dioxide (CO2), and PM. Additionally the report will detail findings o the effects of biofuels on the engine's fuel system performance and normal wear and tear.

www.emsysmarine.com

Tube-Mac



Tube-Mac Industries (TMI) was founded as a piping systems repair and installation business. It has since grown, and today provides complete piping layout, manufacture and on-site project supervision of various non-welded piping solutions. TMI uses Non-welded Flanged and PYPLOK connector systems as an alternative to welded piping systems. The advantages gained by Tube-Mac are not only the saving of time and labor costs but also the elimination of acid pickling and flushing processes, which are required to rid the pipe of the contamination caused by welding.

Email: chris.peitchinis@tube-mac.com
www.tube-mac.com

AVEVA Releases AVEVA Engineering

AVEVA released AVEVA Engineering, a new product where the full definition of tagged engineering items (equipment, lines etc.) can be developed by multi-disciplinary teams of specialist engineers working concurrently. Users can benefit from more effective management, control and exploitation of data as well as a reduced impact of change on cost, schedule, quality and risk as changes can be implemented quickly and communicated effectively. A wider range of data inconsistencies can be detected during design enabling increased design quality and reduced risk of costly late design changes and associated rework.

With an accessible user interface based on Microsoft Office Fluent, including built in spreadsheet style tools, AVEVA Engineering is designed to be highly configurable incorporating a powerful programming language (PML) and .NET APIs. This allows customer/industry customizations and automations to be applied quickly and effectively. In-built status control gives engineers better visibility of the quality of information as they work.

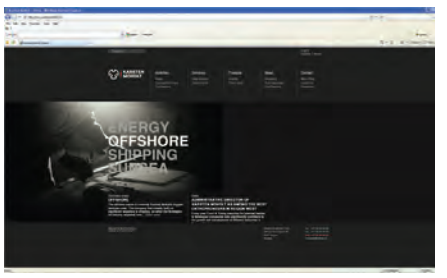
www.aveva.com

Barracuda Marine Computer Series

Kessler-Ellis Products (KEP) Marine debuts a line of marine-grade mini-rack computers, the Barracuda series. The Barracuda systems fit KEP Marine's new proprietary space-saving 12-inch rack. The framework is designed for easy stowaway of computers on all size vessels and where space is limited. The marinized Barracuda computer series and rack mount system feature the quality, durability and marine-customized performance signature to KEP Marine solutions. Featuring an upgradeable AMD Athlon II Dual Core Central Processing Unit (CPU), the new computers deliver high-quality video processing for complex charting, and VGA, DVI and HDMI outputs for connection to a wide variety of displays. KEP Marine Barracuda series computers have suggested retail prices starting at $2,998.

www.kepmarine.com

Condition Monitoring for Offshore Units

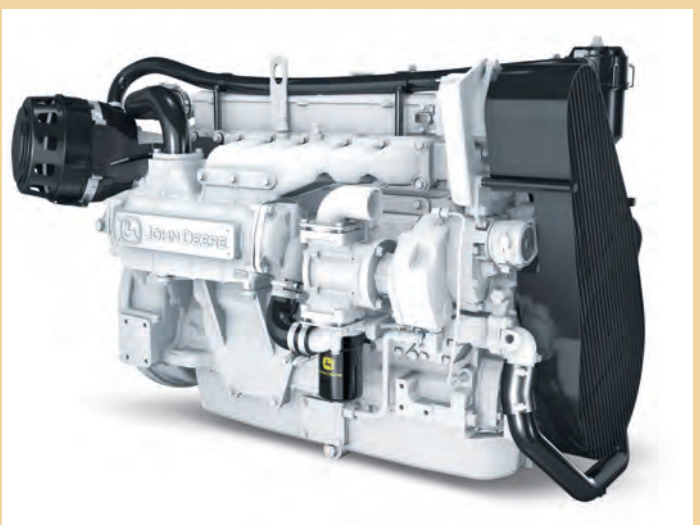


Bergen-based company Karsten Moholt is the first in the world to become a DNV (Det Norske Veritas) approved provider of Condition Monitoring Services for mobile offshore units. This represents a significant cost-saving potential for the oil and shipping industry. At present, the sector performs maintenance on machinery and components at set intervals, and as a result, excessive or low maintenance is often carried out. Perfectly good parts are replaced, and this costs industry large amounts of money annually. A more flexible maintenance process is achieved, and machinery is only opened up when necessary. The certification covers all mobile offshore units such as oil installations, FPSOs and will cover standard vessels.

www.karstenmoholt.no

Redesigned 6068SFM75 Marine Diesel

John Deere Power Systems (JDPS) debuts a redesigned PowerTech 6068SFM75 marine diesel engine that offers a power range of 186 kW to 298 kW (249 hp to 400 hp). The redesigned PowerTech 6068SFM75 joins the PowerTech 6090SFM75 at 410 kW (550 hp) and 6135SFM75 at 559 kW (750 hp) to complete the high horsepower marine engine lineup. The new 6.8L marine engine represents John Deere's continued commitment to offer customers a complete lineup of marine engines rated for commercial fishing and high-speed recreational craft.



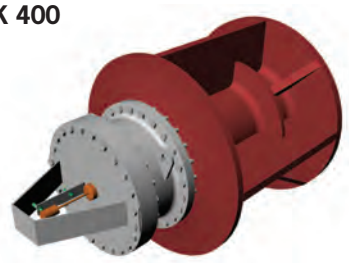
John Deere's redesigned 6.8L marine engine is 229 mm (9 inches) narrower than the previous 6068SFM75 design, which offers a more compact engine for vessels with reduced clearances in the engine room. The 6.8L propulsion engine is due to hit the water in the fall of 2011, while the generator drive ratings will be available in 2012. The newly redesigned engine meets Environmental Protection Agency Marine Tier 2 European Union emissions requirements and is MARPOL Annex VI compliant. The PowerTech 6068SFM75 has 6.8L of displacement and offers up to 298 kW (400 hp). The 6068SFM75 is a 6-cylinder, electronically controlled, turbocharged and air-to-seawater aftercooled marine engine.

www.deere.com

Beacon Finland's JAK ATB Coupling System

This machinery and naval architectural group is headquartered in Rauma, Finland, with HallmaLLC, based in the USA providing sales and technical support for

JAK 400



business development, installations and maintenance consultation. Beacon Finland's JAK-ATB tug/barge coupling systems are designed and engineered by experienced naval architects and marine engineers. The JAK coupler pins are manufactured from solid stainless steel materials. The JAK system is touted by its developer as being lighter than alternative ATB coupling systems, and cost competitive. Currently, there are more than 50 JAK systems operating in both North & South America.

www.beaconfinland.com

Professional Tank Cleaning: Turnkey Corrosion Control

Professional Tank Cleaning & Sandblasting provides a turnkey corrosion control services for several different areas on board mega yachts and lager service vessels.

The key to any successful coating system has three main components: Removing Salts & Surface Contaminants, Producing the Proper Surface Profile & Proper Selection and Application of the Appropriate Coating or Tank Lining. The most popular areas of rehabilitation projects on include: all tanks, bilges, exhaust trunks, sea chests, shaft tubes, cofferdams, chain lockers, bulwarks and hulls.

www.protank.net

Remote Access Via Maretron Cloud Services

Maretron introduced a subscription-based internet service for remotely monitoring and controlling a vessel from anywhere in the world. Using the vessel's Internet connection, Maretron's onboard equipment automatically logs onto the Maretron Cloud Server. Users who wish to access the vessel simply log onto through Maretron Cloud Services, which provides complete access to the vessel. Maretron Cloud Services pricing is based on monthly data usage and starts as low as $295 for a one year service contract. Maretron's N2KView Mobile software allows you to monitor and control your vessel's systems from your smart phone or tablet device. This includes Android (2.2 and higher) smart phones and tablets as well as Apple iPod, iPhone, and iPad.

http://www.maretron.com

Analytic Systems Products ABS Certified

Analytic Systems has started the process of certifying its marine specific power conversion products. The first models to be certified to ABS standards are the new BCA1505 (a 1500W AC charger); the BCA310 (a 300W AC charger); the IPS300 DC/AC Inverter (a 300W Inverter) and the VTC315 (an isolated DC/DC 300W converter). Analytic Systems is looking to bring on new Commercial Marine customers/resellers with these newly certified products.

Email: billw@analyticsystems.com

AR Engineering's New Computer

AR Engineering unveiled its newest marine computer designed for the latest software from MaxSea and Nobeltec. The Advantage TZ has Intel core I5 processors and a video card with 512MB of video RAM. This Nobeltec and MaxSea recommended card optimizes graphic intensive programs such as Nobeltec Trident and MaxSea TimeZero. This is the only high performance, fanless marine computer capable of running commercial versions of MaxSea such as TimeZero Plot. All of AR Engineering's computers feature SeaSafe marinization, a hardening process that consists of vibration dampening, and a corrosion control process using VCI's (vapor corrosion inhibitors) and conformal circuit board coating. This fanless design takes corrosion control one-step further by limiting the airflow through the unit. The un-circulated air is warmed by the internal components, resulting in a very dry environment, regardless of outside humidity.

www.marinecomp.com

Digital Pressure Gage

OMEGA is offering new ranges on its DPG409 Series digital pressure gages. In addition to Gage and Absolute pressure ranges, new models are now available with: Sealed Gage ranges from 100 to 5000 psi; Compound Gage ranges from +/- 10 inH2O to +/-15 psi; Vacuum (negative gage) Ranges from 0 to -10 inH2O to 0 to -15 psi; and Barometric Ranges from 0 to 1100 hPa to 880 to 1100 hPa or 0 to 32 inHg to 26 to 32 inHg. Omega's new DPG409 series of high accuracy digital pressure gages feature a large backlit display makes it possible for user to read digits from over 10.7m (35 ft). The rugged Stainless Steel enclosure is designed specifically for wash-down, sanitary and marine applications. This DPG409 has also been tested to Industrial CE specifications. Ranges from Vacuum to 5000 psi are available and all units included setup software which allows for fast installation and calibration via a USB connection.

www.omega.com/pptst/DPG409.html

Ultrasonic Flow Systems

GF Piping Systems added an Ultrasonic Flow Measurement and Logging Family to its line of flow and analytical measurement instrumentation. Featuring advanced DSP technology, the new ultrasonic family includes two portable models, Portaflow 220 and 330 ,and two fixed installation models, Ultraflo 3000/4000. Both system types display instantaneous fluid flow rates or velocity and totalized values and install quickly and easily without interrupting the process stream. The systems' data loggers can output data directly to a PC

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PS Form **3526-R**, September 2007 (Page 2 of 3)

or printer or store data in the instrument's memory for downloading at a later time. Instruments are supplied with two types of transducer sets to accommodate pipe sizes ranging from as small as ½" to as large as 78 inches in outside diameter(OD).

Email: us.ps@georgfischer.com;
Web: www.gfpiping.com

Nu Flow's Pipe Lining Solution

Nu Flow offers in-place technology to clean and line all types of pipes ranging from ½- to 12-in. in diameter without removing pipes or tearing up walls, ceilings or floors. The technology is designed to create a new pipe within the original pipe, restoring the pipe system to a "better than new" condition for a long-term solution. Nu Flow's patented corrosion-preventive epoxy will eliminate the need for time-consuming and expensive bulkhead exposure repairs that previously had to be made while the vessel was in dry dock. This pre-emptive practice is now standard procedure prior to commissioning new aircraft carriers and is part of the U.S. Navy's protocol to prevent rust and corrosion. The Navy developed this patented epoxy for their aircraft carriers to avoid the costly and time consuming process of replacing pipe systems in their aircraft carriers. Nu Flow is the master licensee for that patented epoxy and makes this technology available for civilian applications.

Epoxy lining of naval vessels' piping systems began in 1988 with the USS America by American Pipe Lining Inc., which has since merged with Nu Flow. We

www.nuflowtech.com

DMS-500 Motion Sensor

Teledyne TSS' DMS 500 range has been launched to meet the needs of users who require a conservatively priced, top-quality motion sensor with Ethernet connectivity, but without the high integrity subsea housings that typify Teledyne TSS products. The newest addition to the range is the DMS-500H, and it can be used to measure heave and has important applications such as in support of crane and winch control and helideck operations. The DMS-500RP was launched earlier in the year and has been developed to measure roll and pitch to meet the needs of dynamic positioning (DP) system builders or any application that needs to provide high dynamic accuracy during vessel turns or extreme sea conditions. There are currently three models in the roll and pitch range; the DMS-525RP, the DMS-535RP and DMS-550RP.

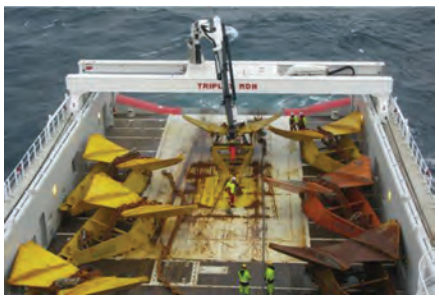
www.teledyne-tss.com

HC/CH Clutches for Marine Applications

Industrial Clutch, Waukesha, WI, introduced the Model HC/CH clutch designed for use in marine applications including drawworks, winches and propulsion. HC/CH models are drop-in replacements to competitive clutches.

The HC/CH clutch features a unique, patent-pending key seal that allows for the use of standard O-rings and improves the ease of installation in current configurations using a double keyway and single drilled actuation hole. This innovative key seal simplifies the sealing process and minimizes the possibility of damage to expensive seal arrangements. All HC/CH models feature forced oil-cooling provisions for high-energy engagements.

www.indclutch.com



HATLAPA Acquires Triplex AS

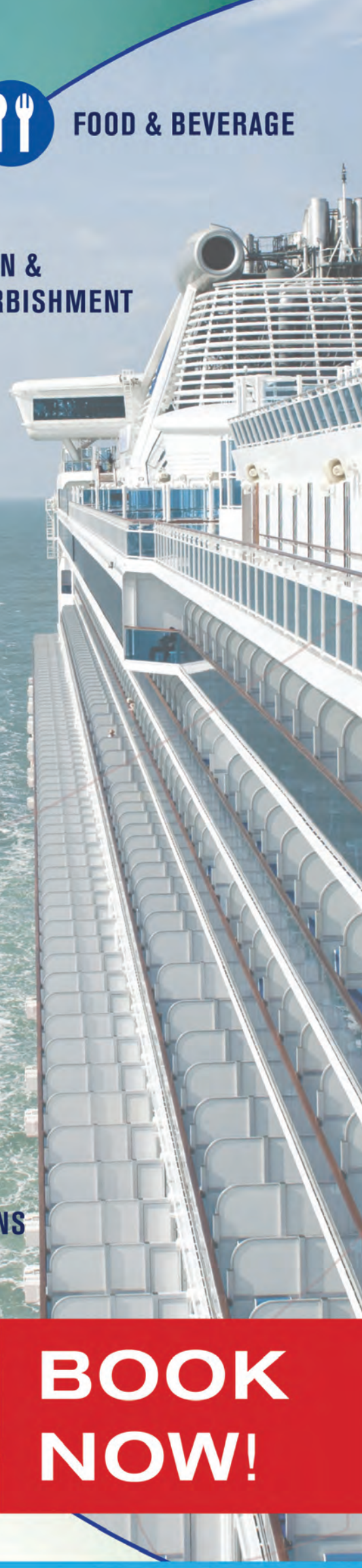
HATLAPA Marine Equipment purchased a majority shareholding in the Norwegian deck machinery company Triplex AS. In doing so HATLAPA's traditional product portfolio of compressors, steering gear and winches has now been significantly expanded to include all components of a typical deck machinery package for supply vessels and AHTs. With oil and gas exploration and production taking place in deeper and deeper waters the requirements of support vessels is developing significantly and with it the need for more sophisticated and automated equipment. This is in addition to the growing demands of wind farm support vessels. "We are now in a position to deliver everything from winches and remote controlled gantry cranes (Multi Deck Handler – MDH) with manipulator, to stern rollers – basically all the deck machinery you need", said HATLAPA Managing Director Alexander Nürnberg. The Norwegian company is the global market leader for anchor handling systems, buoys and ropes on board ships. "Our companies complement each other totally – it's a perfect fit," said Nürnberg, who will be Chairman of the new subsidiary. Triplex AS has 70 employees, based in the small North Atlantic town of Averøy near Kristiansund and has an annual turnover of 30 million Euro. In addition Triplex has a site in Chile, with 17 employees.

Liebherr Celebrates Milestone

Liebherr-Werk Nenzing GmbH celebrated its 35th anniversary with an open day with over 20,000 visitors in the Austrian village of Nenzing. Festivities started on Wednesday, September 28th, and on the second day Liebherr-Werk Nenzing GmbH welcomed around 500 customers from all over the world. The open day was a showcase of the Nenzing factory, with company tours, machinery presentations, multi-vision shows, and information booths. The company tour led through all production facilities and offered the guests an insight into production technologies such as fully automated robot manufacturing in the new workshop building VIII. One of the highlights was the presentation of the first hydraulic hybrid drive Pactronic for mobile harbor cranes, providing an increase in turnover combined with reduced fuel consumption. This innovative drive system and its positive effects on the working speed were impressively demonstrated on the prototype of the new mobile harbor crane LHM 420. Another innovation introduced for the offshore industry was the Active Heave Compensation (AHC) system, which registers the strength of wave movement and accurately aligns the suspended load.

http://www.liebherr.com

WHERE THE CRUISE INDUSTRY UNITES



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Coastal Expands Presence

After 10 years, Coastal Marine Equipment is a leader in the manufacturing of deck machinery for OPA 90 barges, OSVs, PSVs, ATB tugs and government vessels all delivered throughout the world successfully operating in some of the harshest environments. CME offers a complete line of marine deck equipment including anchor windlasses, capstans, towing winches, mooring winches, anchor winches, reels, spud winches, stern rollers, tow pins and rescue boat davits.

CME's 30,000 sq. ft. manufacturing facility and 5,000 sq. ft. office is located on eleven acres in Gulfport, Miss., in the center of the Gulf of Mexico and boat building region. Each step in the manufacturing of CME's equipment is performed in-house including engineering, purchasing, quality control, safety, welding, CNC and manual machining, surface preparation, assembly and testing.

www.coastalmarineequipment.com

Appleton Marine Deck Equipment

Appleton Marine is not only a manufacturer of cranes, but a turnkey supplier of all types of handling equipment including winches, A-frames, anchor windlasses, capstans, and hydraulic power units. Current projects include packages for NOAA, the U.S. Navy, and various offshore oil installations. All equipment is proudly manufactured in the U.S.A. Contact Appleton Marine, a single source for your deck equipment needs.

www.appletonmarine.com

Rapp Hydema Winch Drive Retrofit for Otto Candies'

Rapp technicians recently completed a winch drive retrofit for Otto Candies. An existing Rapp hydraulic winch was converted to electric, making use of Rapp's Active Heave Compensation (AHC) package. "Active Heave Compensation

is important for our future vessel operations in Brazilian waters, and the Rapp package has shown well with other customers," said Brant Folse, Project Manager and Marine Engineer at Otto Candies.

The Rapp design features liquid cooling—despite the fact that the R&D team at the outset considered myriad air-cooled designs before opting for liquid-cooling. The Rapp motor is designed to provide more kW per kilogram of weight than comparable air-cooled designs. Owing to favorable acknowledgement in the industry, Rapp patented the design. The motors are mounted on Rapp's own in-house manufactured gearbox, that it developed long ago for its hydraulic winch lines.

www.rappmarine.com

TTS Marine Division Wins Electric Winch Contract

Through its subsidiary TTS Marine GmbH in Bremen, TTS Group ASA has signed a contract worth approximately $4.5m. The contract with Hyundai Heavy Industries in South Korea concerns delivery of electric-driven winch systems for 4 container carriers for a German owner.

The delivery will take place within 2013 – 2014.

Vestdavit Supplies Extra-Long Outreach Seismic Davits

Norway-based boat handling system and specialized davit supplier Vestdavit has been contracted by Mitsubishi Heavy Industry on behalf of Petroleum Geo-Services (PGS) to design and supply extra-long outreach workboat/lifeboat/FRC davits for PGS's 5th generation Ramform new building seismic vessels. The two davits for each of the two vessels building at Mitsubishi Heavy Industry, Japan for 2013 delivery will have an extra-long outswing to be capable of launching and recovering 20 man tender boats safely in seas states 5 – 6. Vestdavit has designed a special Vestdavit H – 10000S dual point hydraulic davit with a dual winch system for the application. Atle Kalve, development manager, Vestdavit, says, "These davits will make deployment and retrieval safer for PGS' crews. The tender boats will normally be used in relatively calm sea states, but are constructed to handle safely even in sea state 6, and these davits will recover them safely in those seas."

The boats and davits also have the function as lifeboats and Fast Rescue Craft in an emergency. A key benefit of these davits is the simplicity of use, which reduces crew training needs.

New Approach to Offshore Mooring

Measurement Technology NW (MTNW) implemented its running line tensiometer (RLT) technology with a Samson synthetic rope in an offshore mooring monitoring project engineered by Delmar Systems. This implementation is MTNW's first use of tension measurement technology with 2"+ synthetic ropes. Recently, Delmar Systems was contracted to moor an offshore supply vessel (OSV) to a major offshore platform in the Gulf of Mexico. The OSV is being used as a support vessel while dive operations are conducted. The OSV is using a three-point mooring system consisting of two stern hawser lines attached to the platform and a bow mooring line attached to a preset suction pile foundation in 2,900 feet of water. The mooring system had to be as robust as possible while still maintaining ease of handling and rigging by the vessel crew.

To achieve a higher Maximum Breaking Load on the OSV bow mooring line while maintaining deck maneuverability, Delmar chose Samson's AmSteel-Blue HMPE rope made of high modulus polypropylene (HMPE) as the bow winch line. An MTNW RL-20175K running line tensiometer provided tension measurement for the bow line. During the design phase of the project, MTNW thoroughly tested and calibrated the RLT using the specified 2¼" AmSteel-Blue rope.

"This is MTNWs first use of an RLT to measure tension in a major synthetic mooring line of this large diameter," said Tom Rezanka, managing director of MTNW. "Our RLTs are more commonly used to measure the tension of wire rope, but synthetic lines have different mechanical characteristics under load. We were able to collaborate closely with the R&D engineers at Samson. The monitoring system was fully tested, calibrated and witnessed on an ABS-certified test bed with the resulting accuracy identical to wire rope applications."

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

Mandel Metals, 147 Main Street, Chardon, OH

ATTORNEYS

Blank Rome, International and Maritime Litigation 600 New Hampshire Avenue, NW, Washington, DC , Germany , tel:(202) 772 - 5800, fax:(202) 772 - 5858, JKimball@BlankRome.com

AUTOPILOT SYSTEMS

AG Marine, 5711 34th Ave NW 2nd floor, Gig Harbor, WA

BALLAST

HF Sceintific- Watts Water, 3170 Metro Parkway, Ft. Myers, FL

BOATBUILDING AND DESIGN

Brunswick Commercial and Government Products, 420 Megan Z Avenue, Edgewater, FL Molde, Norway , tel:(386) 423 - 2900, fax:386-423-9187, BCGPinfo@brunswick.com

BOW AND STERN THRUSTERS

Omnithruster Inc., 2201 Pinnacle Parkway Twinsburg, Ohio 44087, Cleveland, OH 44139, USA , tel:330 963-6310, fax:330 963-6325, widmer@omnithruster.com contact: Kurt Widmer, www.omnithruster.com

CAPSTANS

Coastal Marine Equipment, 20995 Coastal Parkway, Gulfport, MS 39503-9517, USA , tel:228-832-7655, fax:228-832-7675, sales@coastalmarineequipment.com contact: Ralph Waguespack, www.coastalmarineequipment.com

COATINGS/ CORROSION CONTROL/ PAINT

Eureka Chemical Company, 234 Lawrence Ave., South San Francisco, CA , tel:888-387-3522, sales@fluid-film.com

International MetalFusion Corp., PO Box 23279, Houston, TX 08003, USA , tel:409 515-0532, fax:409 419-0762, sales@metalize.net contact: Abad Rebollar, www.metalize.net

COMMUNICATIONS

Japan Radio, 1011 SW Klickitat Way, Bldg B Suite 100, Seattle, WA 98134, USA

COMMUNICATIONS SERVICE

David Clark, PO Box 15054, Worcester, MA 01615, USA , tel:1-800-298-6235, Sales@davidclark.com contact: Sales Department, www.davidclark.com

COMPOSITE SHAFTS

Centa Corp., 2570 Beverly Drive #128, Aurora, IL 60559, USA , tel:630-236-3500, fax:630-236-3565, bobl@centacorp.com

CORDAGE

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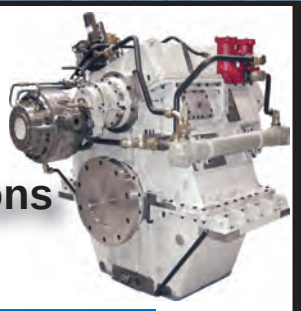

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