

July 2013

MARITIME REPORTER AND ENGINEERING NEWS

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Responding to the Piracy Threat

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MAN Diesel & Turbo Powers Ahead

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Brazil & Class

Navigating a Complex, Challenging Environ

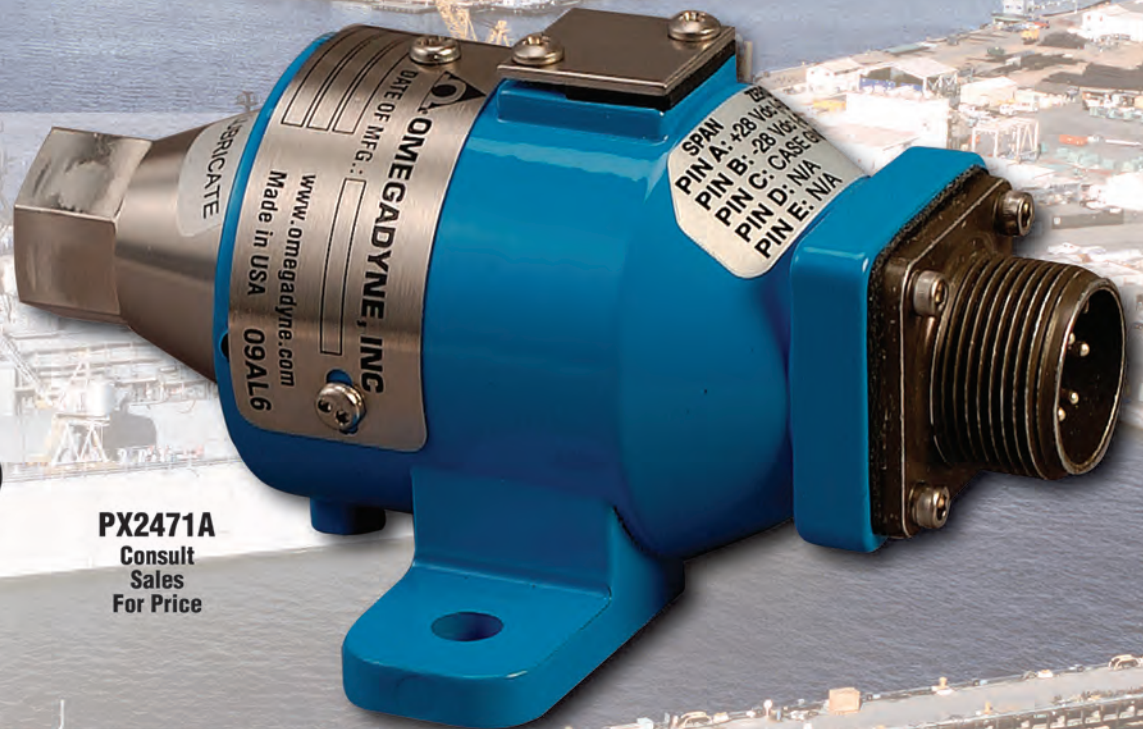
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(Image courtesy Alex Sergienko)



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

LNG Gensets for Marine Sandfirden Technics Debuts Scania LNG-Gensets

For the brand-new gas/electric-powered inland shipping tanker MTS Greenstream, Sandfirden Technics located in Den Oever, The Netherlands, has developed a series of special Scania gas generator sets. Each of the sets, power output at 285 kWe, runs on 100% natural gas. They are the very first natural gas engines which have been marinized and classified in the power range of up to 300 kWe.

The engines are based on Scania's diesel engines, modified in cooperation with Sandfirden. Features of the SGI-12 and SGI-16 gas engines are single cylinder heads with four-valve technic, heavy-duty industrial glow plugs, with a durability of 2,000 operation hours. The mechanical output, available at the flywheel, is between 205 and 300 kW (COP) at 1,500 and 1800 rpm. This is a very much appreciated feature because of the lower gas consumption and, of course, the lower noise emission. Thanks to the Scania's own developed electronic control and speed regulation system, the engines can be switched from 1,500 to 1,800 rpm whenever this is needed.

These so-called "lean burn" engines operate in an air-rich environment. This extra air lowers the combustion temperature causing the engines to emit far less harmful substances and consume less fuel. "Compared to the diesel version, our gas engines deliver a

more than 80% reduction in the emission of nitrous oxides (NOx) and a more than 20% reduction in CO2 emissions, with zero emissions of SO2 and soot," said Erik de Wit, General Sales Manager of Sandfirden Technics. "At the same time, the gas engines deliver a high output, are extremely reliable and maintenance costs are low. By using a completely new developed fuel system, the gas supply is regulated in such a way that the quantity of fuel delivered can be adjusted extremely rapidly to every demand placed on the propulsion system. This adaptability ties in perfectly with the sailing profile of coastal and inland shipping." Sandfirden Technics, main dealer for Scania industrial and marine engines for the Benelux countries, have been building gas engines for industrial applications based on the Scania diesel platform for 12 years. These gas engines are for example used as generator drive systems in combined heat and power installations. More than three years ago, Sandfirden Technics started preparing these engines for maritime applications. In collaboration with Lloyd's Register of Shipping (LRS), the Scania engines were duly adapted, extensively tested and approved.

Excerpted from a post on MaritimePropulsion.com by Peter Pospiech, Germany

Schottel: New Large Thrusters Units

A company whose corporate roots go back to 1921 continues to lead through its ongoing investment in R&D, now unveiling a new generation of their larger thruster units with their housings hydro-dynamically optimised using CFD techniques. These new thrusters well-known as SRP (Schottel Rudder Propellers) and STP (Schottel Twin Propellers) are available with a variety of reduction ratios to suit all common input speeds whether diesel engine or electric motor driven, and Schottel add that they are more compact in size than existing thrusters in the range.

The new thrusters come with an independent, hydraulically operated multi-disc clutch, which not only engages and disengages the drive train from the thruster but also drives the hydraulic units of the thruster, making it practically self-contained. The system is simplified to make maintenance easier, and the clutch is installed separately outside the gearbox using the same type of oil for operation and cooling that is used for lubrication of the thruster. No additional auxiliary units are needed to operate the clutch.

In addition to the hydraulically operated clutch, these units also have a hydraulically operated multi-disc holding brake, which is used to block the propeller from turning during service and maintenance work.

Like the clutch, the brake is a separate system outside the upper gearbox and is fully self-contained, requiring no mechanical interface or auxiliary units outside the thruster.

Schottel say that all their thrusters are prepared for integration with their Condition Monitoring System S-COM as an aid to maintenance scheduling.

Excerpted from a post n MaritimePropulsion.com by George Backwell, Thailand,

Submarine Minnesota Delivered



(Photo: Huntington Ingalls Industries)

Minnesota (SSN 783), the last of the Block II Virginia-class submarines, delivered 11 months ahead of schedule.

Huntington Ingalls Industries (HII) said that the company's Newport News Shipbuilding (NNS) division delivered the submarine Minnesota (SSN 783) to the U.S. Navy. The boat, the last of the Block II Virginia-class submarines, delivered nearly 11 months ahead of schedule. Construction of Minnesota began in February 2008, and the keel was authenticated in May 2011. The 10th Virginia-class submarine, named to honor residents of Minnesota and their continued support of the U.S. military, was christened Oct. 27, 2012. Minnesota's commissioning date has been scheduled by the Secretary of the Navy for Sept. 7.

The 377-foot long submarines are capable of submerged speeds of more than 25 knots and can stay submerged for up to three months at a time.

Multtraship Strengthens Fleet With ASD Tug

Multtraship has contracted with international broker and consultant DSB Offshore for the long-term bareboat charter of the 72-ton bollard-pull vessel, which was built by the Bogazici Shipyard in Turkey in 2010 and is equipped to undertake a range of services including towage, escort, anchor-handling, fire-fighting and salvage. Multtraship 20 has two Schottel SRP 1515 propulsion units and is powered by two Caterpillar 3516B engines. Its 244 cu m bunker capacity allows for both coastal and open sea towage and, with a length overall of 32.5 m, it can comfortably perform harbor towage operations. Deck equipment includes a 200t/80t MacGregor escort winch, a 130t/65t towing winch, a deck crane, a triple shark jaw, tow pins and a 130t stern roller. The main cabin seats 150 and vessels accommodate 12 crew in a mix of officer and crew cabins. The port hull features galley and mess facilities. SEACOR Lynx's stability is designed to fully comply with the IMO HSC code, giving regulatory versatility.

Kvichak Delivers for BPD

Kvichak Marine Industries, Inc. recently delivered the Patrol 28, a 28 x 9.25 ft. all-aluminum vessel to the Boston Police Department Harbor Unit (BPD). Designed by Kvichak/Amgram Ltd., UK and built by Kvichak Marine, the Patrol

28 is effective for operation in port and coastal waters, including shallow areas. Missions for the Patrol 28 include search and rescue, border patrol and maritime security. Powered by twin Honda 225 hp VTEC outboards, the Patrol 28 cruises at speeds over 45 knots.



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Gas? It's the Question & the Answer

One of the true pleasures of being so long-tenured in this position (besides looking back at my editorial picture of 1992 and thinking I look like I'm 10), is gaining invaluable perspective on technological trends as they come, evolve and eventually live, mutate or die. (For example, I can now safely surmise that the "Hinge Ship," so proudly and loudly touted on the cover of sister-publication *MarineNews* many years ago, will not be seen on your waterways anytime soon!)

As we personally and professionally are perpetually and with increased frequency bombarded with insights on the "latest and greatest," age and experience have confirmed that time and trial are truly the invaluable measures by which to gauge a new technology's merit.

I have written and you have read many times that the maritime industry is conservative. In thinking on the conservative nature of the industry – and as a native my first 18 years of Cincinnati – I often think of one of my favorite quotes attributed to **Mark Twain**:

*"When the End of the World Comes, I Want To Be in Cincinnati.
It Is Always Ten Years Behind the Times"*

Not So Fast

Lately though, I'm not as certain that our industry is so conservative. Yes, vessel owners tend to stick to the tried and true, lamenting new rules which demand new technology, new investment. But point to an industry that does not lament being told how and when to spend its money. Yes, there are many technologies – from modern marine communications to navigation and propulsion innovations – that have proven to help companies run a more efficient, cost-effective and dynamic operation. But as industry leaders upgrade their fleets to attract and retain top talent and to ensure its vessels are operated safely and efficiently, the rest tend to follow.

Today, the "hot" topic is gas, or more accurately LNG as marine fuel. Across our four print titles, our seven websites and three apps, not a day goes by without someone, somewhere writing on the present status and future prospects of LNG in the maritime market.

There have been many varied proclamations on how fast and how far LNG will penetrate the maritime market, and readers of these pages surely




are familiar with the LNG arguments on both sides of the fence.

To recap, the use of LNG addresses the fast tightening rules on emissions from ships and boats, and in the long run it appears that this fuel source will be considerably cheaper. On the flip side, there are a dearth of bunkering facilities globally, and while LNG has proven to be stable and reliable, the rule books on the safe handling of LNG onboard marine vessels, not to mention potential safety in ports, are literally being written.

To get some answers I have the pleasure of direct and ready access to most every major power supply company in the world, including MAN Diesel & Turbo and Wärtsilä (to name two of many; these two spring to mind simply because of the recent nature of the conversations). In speaking to both recently, specifically John Hatley and Frank Donnelly of Wärtsilä North America and Thomas S. Knudsen of MAN Diesel & Turbo, it is crystal clear that both companies view the evolution of LNG as marine fuel in fact a revolution, analogous to the conversion from steam to diesel so many years ago. The rapidity of transformation is anyone's guess, but the marine industry today casts a cautious eye on 2020 as a pivotal year for stringent new mandates on fuel quality and emission levels.

This month you will find two features on LNG, starting on page 14 with insights from MAN Diesel & Turbo's Knudsen, who addresses in a straightforward manner the successes to date and hurdles to overcome, as well as details on the company's big ME-GI event recently in Japan; and on page 18 where long-tenured contributor Dennis L. Bryant discusses how the barriers are falling.

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Caterpillar to Acquire Berg Propulsion

Caterpillar Inc. signed a definitive agreement to acquire Johan Walter Berg AB, including its core brand of Berg Propulsion, a leading manufacturer of mechanically and electrically driven propulsion systems and marine controls for ships. With the acquisition, Caterpillar will transition from selling only engines and generators to providing complete marine propulsion package systems.

Headquartered in Öckerö Islands, Sweden, Berg has designed and manufactured heavy-duty marine thrusters and controllable pitch propellers since 1929. Its proprietary systems are em-

ployed in maritime applications throughout the world that require precise maneuvering and positioning. "Berg is one of the most highly regarded brands in the marine industry," said Tom Frake, Caterpillar VP with responsibility for the Marine and Petroleum Power Division. "Our team will now be able to provide worldwide Caterpillar support to marine operators for a complete, optimized pro-

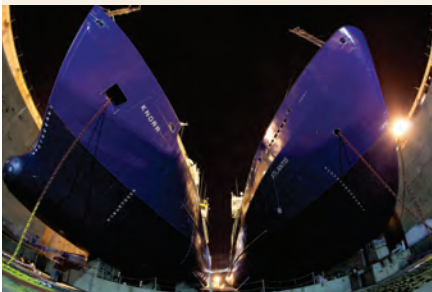
pulsion package, including bow thrusters, gear boxes and shaft alternators." Berg will become part of the Caterpillar Marine and Petroleum Power Division, which supplies diesel and natural gas engines for the generation, control and supply of mechanical and electric power for the marine and petroleum industries.

"This marks the beginning of an exciting new chapter in our company's

history and is a chance to become part of the strongest brands – both Caterpillar and MaK – in our industry," said Håkan Svensson, Berg's CEO. "Berg has proudly served the marine industry for 101 years. Berg's thrusters, propellers and control systems will be rebranded as Caterpillar soon after the close of the deal, which is expected in the Q3 2013, pending final regulatory approvals.

Clarification

Last month we published the results of the 3rd Annual Don Sutherland Memorial Photo Contest, and the winner in the "Ships & Boats" category was erroneously credited. Below a "replay" of this stunning image with full credit details to Chris Morgan, Chief Engineer on R/V Atlantis. Ken Kostel submitted the image for the contest.



Winner: Ships & Boats


By Chris Morgan, Chief Engineer on R/V Atlantis

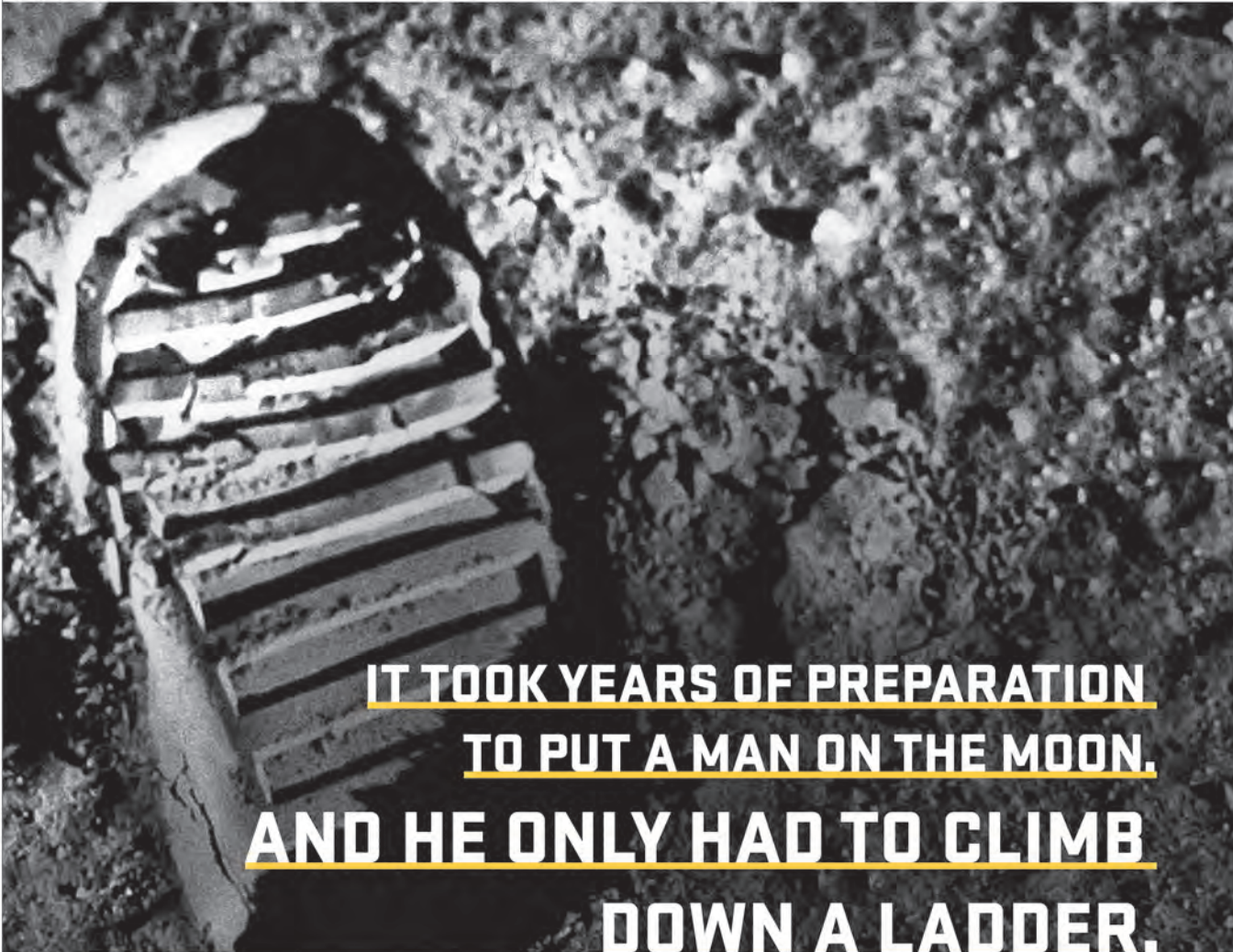
Photographed December 2012 in Charleston, S.C.

Two of the nation's global class oceanographic research vessels, R/V Knorr and R/V Atlantis, completed a drydock period together at the end of 2012, where they were both inspected and repainted. Both ships were built by the U.S. Navy, are funded by the National Science Foundation, and operated by the Woods Hole Oceanographic Institution on behalf of the University-National Oceanographic Laboratory System. Atlantis is best known as the support ship for Alvin, the country's only deep-diving research submersible. Knorr was the ship on which Dr. Robert Ballard was sailing when he and his team discovered the wreck of Titanic in 1985.

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Indianapolis Hosts Third National SeaPerch Challenge

The City of Indianapolis and the Indiana SeaPerch regions were the ideal combination to host the Third National SeaPerch Challenge at the Natatorium on the campus of Indiana University Purdue University Indianapolis (IUPUI) on May 17 – 19, 2013. On Friday evening, May 17, 83 top robotic teams from middle and high schools, after school and out-of-school programs in 23 states and the Commonwealth of Puerto Rico convened at the IUPUI Natatorium for a weekend of competition and fun-filled activities. This Third National Challenge was sponsored by the Office of Naval Research (ONR), AUVSIFoundation and NAVAIR as well as ASNE, CISD, Indianapolis State Police Divers, Maritime Reporter, Mississippi State University, NAVSEA, Navy League STEM Institute, Naval Submarine Support Facility, New London, Navy Recruiting District Michigan, NDEP, RoboNation and STEM2Stern. The Office of Naval Research has funded its popular signature SeaPerch Program for almost six years and the program has experienced unprecedented growth numbering more than 100,000 students having participated in almost all 50 states. With more than 6,000 teachers and mentors in the program over the past six years, students have learned valuable life skills through hands-on activities and enhanced science curricula to discover the excitement of STEM (Science, Technology, Engineering and Mathematics) as a potential future career path.

This innovative underwater robotics program trains teachers and provides curriculum enhancement in compliance with national standards to instruct students on how to build an underwater Remotely Operated Vehicle (ROV) in an in-school, after school or out-of-school setting. Students build their own ROV following a curriculum that teaches science and engineering nomenclature, terminology and basic principles with an ocean and marine engineering theme. Because of its popularity and extraordinary rate of expansion in such a short time, a natural goal of the SeaPerch Program has been to develop geographical

regions where top winning teams from regional competitions could then qualify for a national event. This year, 85% of the teams participating at the National Challenge were from established or forming regions, and the remaining 15% were single team entries.

Again this year, teams arriving from all over the country were treated to an informal welcome party on Friday evening at the Natatorium where students, their adult leaders, and the National Planning Committee members, could meet and mingle in a relaxed setting with plenty of kid-friendly snacks to satisfy everyone. Teams were given the opportunity to preregister and to complete the Compliance Checks of their ROV's to reduce the crush the next morning. Coincident with our National Competition, the National Tool and Machining Association's National Robotics League was holding its land-based BattleBot national championships on the same weekend only a few doors away at the Campus Center. Through a joint collaboration between SeaPerch and NRL, the two robotic groups hosted a "Games Night" following our welcome party, which was held very nearby at the JW Marriott Hotel. More than 400 students showed up for light refreshments and fun board games that evening. The next morning, the remaining teams registered and completed their compliance checks as the excitement quickly built for a day of competition starting with the opening ceremonies on the Olympic pool deck. Presiding was Susan Nelson, Executive Director of SeaPerch, who first introduced Steve Tamasi, National Robotics League Team Leader who spoke to the group about the BattleBot championships being held all day Saturday and part of Sunday. Next, Capt. Robert Palisin II, USN, Deputy Head of Sea Warfare and Weapons Department, Office of Naval Research spoke about the value of STEM and this country's need for engineers and scientists followed by Indiana's Lt. Governor, Sue Ellspermann, who welcomed the students to Indiana and reinforced the value of a STEM education helping to restore our nation's prominence.

Throughout the day teams competed in

three events including the Poster Presentation, the Obstacle Course and the Deep Water Transfer on three levels: Middle School, High School, and new for this year, the Open Class, which allowed for unlimited creativity and design innovation. Of the 83 teams in attendance on Saturday, 35 were middle school, 44 high school and four in the new open class. During the Poster Presentations in the auxiliary gym the teams presented their SeaPerch project to groups of judges consisting of engineers and educators. Each poster was scored based on appearance, text/graphics balance, organizational flow, school/team identification. Team members made oral presentations of their objectives, their design rationale, challenges and solutions, and responded to questions from the judges, who also graded their professionalism.

The submerged obstacle course involved five 24-inch diameter hoops, oriented in different planes, through which the vehicles had to travel. Teams were required to navigate through the entire obstacle course, surface, then re-submerge and return through the course again to the end. Scores for this round were based on the shortest time for successfully navigating the course within the 15-minute time allotment.

The Deep Water Transfer event required teams to retrieve up to 12 rings positioned on either side of two racks at different depths, and to place the rings in one of two bins located close to the vehicle operator but also at different depths. Points were awarded for the number of rings retrieved from the racks' near side and from the far side as well as for each ring placed in either the lower or upper bin. Teams were scored on the most points recorded in 20 minutes.

There were 84 judges and volunteers on hand as well to ensure that all events were professionally judged and that the busy day's schedule was maintained. The event was video-streamed live from poolside via the SeaPerch website so sponsors, supporters and team coaches could invite their companies and their schools' principals, superintendents, teachers and fellow students as well as families back home to watch their teams

in action. Near the end of the day's events, invited guests and speakers were on hand to witness the excitement at poolside and in the auxiliary gym prior to the start of the gala awards ceremony and banquet. Nearly 700 people, an increase of 20% over last year in Manassas, Va., were on hand that evening for the festivities at the JW Marriott Hotel. Mistress of Ceremonies, Susan Nelson, began the program by introducing the person, who started it all, Kelly Cooper from ONR, who congratulated all of the teams and encouraged partnering individual SeaPerch programs with universities. Students, teachers, coaches, mentors, speakers, invited guests, judges, volunteers, parents and friends were further enthralled by the remarks from Chevanne Binns-Wallace and Keyan Wills, two students from Baltimore's Mergenthaler Vocational Technology High School, and recent SeaPerch representatives to the third White House Science Fair held on April 20. They were followed by Capt. Troy Mong, USN, Commanding Officer, NROTC, Purdue University and Colonel Alan M. Pratt, USMC, Commanding Officer, NSWC, Crane Division, who inspired the students with stories of their professional and life lessons and relating their SeaPerch experience to STEM subjects in school and potential future careers in engineering and science.

The evening was capped by a speech from U.S. Senator Joe Donnelly from the State of Indiana, who revealed that early on he had been a student of naval architecture, successfully built his own boat, and recognized the importance of the maritime industry to our country. He added another surprising fact that all nuclear submarine propulsion systems for the U.S. Navy's submarine fleet were manufactured right there in southern Indiana!

With anticipation at its highest level, Nelson called for all uniformed military personnel in attendance to join her at the podium to assist in awarding the trophies to the winning middle school, high school and open class teams in all three National Challenge events, a summary of which is summarized on page nine.

(All images courtesy Sproull Photography)



The Joe Iveys, Overall Winning Team



U.S. Senator Joseph Donnelly

2013 National SeaPerch Challenge Results

First Place Obstacle Course

Team	Time or Points
<i>Middle School</i>	
"Sea Knights 4-H" 4-H Robotics Club of Burlington County, Mt. Laurel, NJ	1:03.9
<i>High School</i>	
"Sea Cougars" Colts Neck HS Navy JROTC, Colts Neck, NJ	49.34
<i>Open Class</i>	
"WHS NJROTC" Washington HS Navy JROTC, Washington, IN	1:20.9

First Place Deep Water Transfer

<i>Middle School</i>	
"Poseidon" Seton School/Home School, Manassas, VA	6:38.3
<i>High School</i>	
"The Hero that Gotham Deserves" Owen Valley HS, Spencer, IN	:57.0
<i>Open Class</i>	
"WHS NJROTC" Washington HS Navy JROTC, Washington, IN	7:45.0

Poster Presentation Overall Winner

"FAU Sea Owls" Florida Atlantic University HS, Boca Raton, FL	80
<i>Middle School – Overall Winner</i>	
"Seaperch 1 (St. John's)" St. John the Baptist Catholic School, Newburgh, IN	11
<i>High School – Overall Winner</i>	
"The Joe Iveys" Bloomington HS South, Bloomington, IN	15
<i>Open Class – Overall Winner</i>	
"WHS NJROTC" Washington HS Navy JROTC, Washington, IN	6

2013 National SeaPerch Champion

Team	Total Points
<i>First Place</i>	
"The Joe Iveys" Bloomington HS South, Bloomington, IN	16
<i>Second Place</i>	
"Neptune Robotics" Souderton Area HS, Souderton, PA	20
<i>Third Place</i>	
"Maritime Academy Charter" Maritime Academy Charter School, Philadelphia, PA	25

See You in Mississippi in 2014!

At the conclusion of the ceremony, Susan Nelson announced that next year's National SeaPerch Challenge will be held on the campus of The University of Southern Mississippi in Hattiesburg, MS on Saturday, May 17, 2014. She added that all participants would stay on campus in dorm rooms, and use the dining hall for meals and the university's pool and classrooms for the underwater and poster challenges.

www.seaperch.org



Professional cheering courtesy of the Indianapolis Colts



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A long day, good competition, a rich learning experience and many new friends



Monthly Change
**Secondhand
 Vessel Values**
 by Year & Size

VesselsValue.com provides data driven ship valuations for tankers, bulkers and containerships. These graphs show how vessel value depends on age for the major types. Vessels are assumed to have typical size and specification for age and high built quality at a top tier shipyard.

		VesselsValue.com											
01 July 2013		VV Mini Matrix - Monthly Change											
Built	Tankers					Bulkers				Containers			
	Vlcc	Suez	Afra	LR1	MR	Cape	Pmax	Supra / Hmax	Handy	Post Pmax	Pmax	Handy	Fmax
2013	+2.2%	-0.8%	+6.6%	+4.5%	-0.3%	+0.0%	+4.2%	+6.6%	+6.8%	-1.4%	+0.3%	-5.6%	+5.1%
	310k	160k	110k	75k	50k	180k	80k	60k	30k	7,000	4,250	1,400	750
2008	+2.0%	+0.0%	+4.6%	+2.4%	+0.4%	+1.6%	+0.5%	+1.5%	+3.8%	-1.2%	+0.4%	-6.0%	-2.0%
	310k	160k	110k	75k	50k	180k	80k	55k	30k	7,000	4,250	1,400	750
2003	+0.6%	-1.2%	+4.5%	-0.7%	+0.0%	+2.9%	-1.4%	-0.7%	+0.8%	-0.4%	+0.6%	-5.0%	-6.8%
	305k	155k	105k	70k	45k	175k	75k	50k	30k	6,500	4,000	1,400	750
1998	-1.0%	-3.0%	+3.4%	-4.3%	+0.9%	+1.5%	-1.0%	+0.0%	-3.6%	+0.0%	+2.0%	-2.2%	-9.4%
	300k	150k	105k	65k	45k	170k	75k	48k	30k	6,500	4,000	1,400	750
1993	-1.7%	-1.9%	-2.4%	-1.7%	+1.5%	-2.1%	+1.8%	+0.0%	-8.8%	-2.3%	-2.5%	-3.1%	+0.0%
	290k	145k	100k	65k	40k	150k	70k	45k	30k	4,500	3,750	1,400	750
1988	-1.8%	-2.9%	-2.4%	-1.7%	+2.3%	-2.2%	-1.9%	-2.6%	-13.5%	N/A	-2.5%	-3.0%	+0.0%
	260k	140k	100k	65k	40k	140k	65k	42k	30k	-	3,750	1,400	750

By the Numbers

The U.S. Maritime Administration last month released a report entitled "The Economic Importance of the U.S. Shipbuilding and Repairing Industry," and below are some of the more interesting numbers from the report.

\$36B MarAd said that the nation's shipyards support \$36B in gross domestic product (GDP)

\$7.9B In labor income to the national economy

107,000 Number of jobs provided by 300+ shipyards

\$73,000 Average income for these industry jobs

10 States account for 85.2% of private shipyard employment. In order, they are: Virginia (24.9%); Louisiana (12.1%); Mississippi (9.4%); Connecticut (8.3%); California (7.6%); Maine (5.6%); Florida (5.4%); Texas (5.1%); Alabama (3.6%); & Washington (3.3%).

The report notes the U.S. shipbuilding industry has run a trade surplus in six out of the last 10 years, with a cumulative trade surplus of \$410m over this period. The report also shows that from 2010 to 2012, deliveries of vessels of all types, including tugs and towboats, passenger vessels, commercial and fishing vessels, and oceangoing and inland barges, exceeded 1,200 vessels per year, reaching 1,457 vessels in 2011. The report can be found at

www.marad.dot.gov/documents/MARAD_Econ_Study_Final_Report_2013.pdf



Electrical LNG Carrier to Maran Gas

Woodside Rogers, expected to enter service this month, is first in a series of seven LNG carriers being built for Maran Gas by DSME, a ship which features GE's Induction-Based Propulsion Motor Technology. It is the first electrical LNG carrier to be ordered by Maran Gas. Built by Daewoo Shipbuilding & Marine Engineering (DSME) at its shipyard near Busan, the ship completed sea trials in late April and was delivered to Maran Gas on July 1. The remaining ships in the series are scheduled for delivery through 2015.

"We expect our ship builders to propose the most cost-effective and sustainable solutions for our requirements," said Andreas Spertos, technical director, Maran Gas. "DSME made a strong case for using the GE technology based on their substantial experience over the years, in combination with the tri-fuel engine. This is our first

time working with GE's electric propulsion system. We are very impressed by the level of their technical expertise and confident in the decision to use their electric propulsion systems."

DSME and GE already had cooperated on electric propulsion systems for six vessels prior to the Woodside Rogers.

Over the last 18 months, GE has won contracts to supply induction-based propulsion motor technology on no fewer than 31 LNG carriers. The Woodside Rogers will be the first of those to go into commercial service.

For the Woodside Rogers, GE supplied a complete system comprising of four 9.85-MVA generators, main and cargo switchboards, four transformers, two converters, two 13.26-MW motors and remote control. GE also provided project management, system and equipment engineering, commissioning and assistance for sea and gas trials.

The Technology

GE's induction-based propulsion motor technology has proven to be a technology of choice for LNG carriers because of its combination of high-power pulse width modulation (PWM) technology based on insulated gate bipolar transistors (IGBTs), together with robustly simple induction motor technology. The electric drive system for the Woodside Rogers is powered by tri-fuel engines that run on natural gas, marine diesel gas or heavy fuel oil. The ship operator can choose the mode according to current prices of the different fuels, enhancing the cost-effective operation of the system. The layout of the tri-fuel engine provides a high level of redundancy, which improves the safety of the carrier avoiding off charters. Fuel consumption and emissions also are lower. DSME has chosen GE's electric power systems for numerous vessels in recent years.

www.gepowerconversion.com

Gulf Craft Delivers DP-Capable Crew Boat

Incat Crowther designed CrewZer Class 58m Catamaran Crew boat, Seacor Lynx, is the first of two to be constructed in Gulf Craft. The boat follows Seacor Cheetah, delivered in 2008, a series which also will include Seacor Leopard.

During the first few months of service, the vessel has reportedly operated confidently in very rough seas at full deadweight capacity, demonstrating a maximum deviation of only 0.5 meters DP holding capability in a 3m sea with 4 knots of cross current and a 20 knot breeze. Seacor Lynx is powered by four MTU 16V4000 M73L main engines, driving four Hamilton HT-810 water jets. The vessel has a service speed of 40 knots with more than 120 tons deadweight and a top speed of 42 knots, allowing the vessel to service multiple deepwater installations with reduced transit times, and is a viable alternative to the much higher cost option of helicopter transfer. The combination of four reversing jets and two retractable azimuth thrusters, coupled with a Kongsberg control system, provides the vessels with dynamic positioning in a wide operating area. Seacor Lynx is reported to be the first crew boat with DP3 capability, offering the ability to stay on station even with the failure of any main component such as a main engine or thruster, reference system or fuel system, or loss of any compartment due to a fire or a flood.




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First Triple-E

Named Mærsk Mc-Kinney Møller

Maersk Line's newest vessel, the first of the Triple-E series, was named this morning in a ceremony at the Daewoo Shipbuilding & Marine Engineering (DSME) shipyard in Okpo, South Korea. It bears the name of the late Mærsk Mc-Kinney Møller, who passed away in April 2012 at the age of 98.

Maersk Line CEO, Søren Skou, began the ceremony by welcoming all the special guests and recounting the important tradition of naming ceremonies in Maersk ever since the first event in 1906 welcomed Peter Mærsk as the second vessel in the fleet.

He then handed the podium and the honor of naming the first Triple-E vessel to Ane Mærsk Mc-Kinney Uggla, the youngest daughter of Mærsk Mc-Kinney Møller.

"As you sail the waters of the world, may your journeys be smooth and your tasks successful. May you bring happiness to your crew, may you be a safe haven for all who board you and may you bring pride and prosperity to all. I wish you Godspeed!"

The Triple-E is the largest ship in the world, and it sets new standards in the container industry, not just for size, but also of energy efficiency and environmental performance, Maersk said. With unique design features for slower speeds and maximum efficiency, this vessel will emit 50% less CO₂ per container moved than the current average on the Asia-Europe route.

Maersk Line has ordered a total of 20 of these vessels, which will be phased in gradually over the next couple of years on the existing route between Asia and Northern Europe (AE10).

A Day to Remember ...

TOP

Guests posing with Ane Mærsk Mc-Kinney Uggla and Jae-ho Ko, President and CEO of DSME.

MIDDLE

Ane Mærsk Mc-Kinney Uggla, lady sponsor, christens the ship.

BOTTOM

Ane Mærsk Mc-Kinney Uggla celebrating with Jae-ho Ko, President and CEO of DSME.



Harvey Gulf Options for Sixth TY Offshore Dual Fuel Vessel

TY Offshore said that Harvey Gulf International Marine has ordered the construction of an additional TY Offshore built 302 x 64-ft. Dual Fuel Offshore Supply Vessel, bringing its total order to six. TY Offshore is building all six vessels at their Gulfport, Miss., shipyard. The vessels are powered by cleaner-burning natural gas and will achieve "ENVIRO+, Green Passport" Certification by the ABS. The requirements for this certification include, among others, that the vessels be continuously manned with a certified Environmental Officer, be completely constructed with certified environmentally-friendly materials, and have advanced alarms for fuel tanks and containment systems. These are the first OSV's to achieve this certification, making them the most environmental friendly OSV's in Gulf of Mexico. To achieve environmentally friendly status, the vessels will be outfitted with Wärtsilä's 6L34DF (DF=Dual Fuel LNG/Diesel) Gensets, Wärtsilä Transverse and Steerable Thrusters, Wärtsilä Switchgear and Wärtsilä I.A.S. Machinery Control, Alarm and Monitoring System. Operating in LNG mode provides less noxious emissions than with diesel fuel. The system is designed to maximize fuel efficiency and economical power generation for all operating conditions and is ABS certified. The two AC propulsion drive motors each have a maximum continuous rating of 3620 HP (2700 kW), variable input speed up to a maximum RPM continuous rating.

Ardmore Seaventure Delivered

Product and chemical tanker specialist Ardmore Shipping has taken delivery of the Ardmore Seaventure from SPP Shipbuilding in Korea and immediately delivered the tanker to Cargill on a 12 month time charter arrangement. It is a 49,999 dwt IMO 3 product and chemical tanker and the second vessel to be delivered to Ardmore Shipping from a series of four. The ship follows SPP's design for this class of vessel and includes a number of additional specifications for improved fuel efficiency, including a MAN B&W electronic engine, combined with a Mewis Duct and high performance hull coating from International Paint, together with SkySails' Performance Monitor voyage optimization system. The Ardmore Seaventure has also been verified by ABS in accordance with the IMO's Energy Efficiency Design Index (EEDI).

The Ardmore Seaventure is the eighth vessel in Ardmore's fleet of product and chemical tankers, with a combined total tonnage of over 300,000 dwt and an average vessel age of five years old.



Unique LNG Carrier for Bunkering to be Built

Jahre Marine AS signed a contract with Chinese shipyard Avic Dingheng to build a seagoing LNG carrier for bunkering and small scale distribution. The LNG vessel cargo tank capacity is 6200 cbm. The LNG vessel has an innovative cargo tank solution with non-pressurized IMO A tanks developed and delivered by Torgy LNG AS. Rolls-Royce Marine AS has designed the LNG vessel with gas propulsion and LNG will be taken from the aft cargo tank to feed the engine.

Jahre Marine AS is a part ownership between Donsøtank and Jahre Holding where Donsøtank will have the new building follow-up and technical management of the vessel after delivery. Jahre Marine AS has received funding from the Nox funding in Norway both for the LNG vessels gas propulsion and from the Nox infrastructure funding. Jahre Marine AS has also received support from Innovation Norway through the Environmental Technology funding for the development and analysing process. The LNG vessel new building is subject to owners financing before effective.

This LNG vessel will provide LNG to all the market including shipowners with vessels running on LNG.

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Powering Ahead Cleanly

MAN Diesel & Turbo's Thomas S. Knudsen talks shop on LNG

When TOTE Inc. ordered the world's first LNG-powered containerships (which were honored last month in Oslo, winning the DNV-sponsored "Next Generation Ship Award"), industry excitement was palpable. For MAN Diesel & Turbo it served as a definitive launch point for its ME-GI Dual Fuel engine, which was soon followed with an order from Teekay LNG Partners to power a pair of LNG Carriers. MR had the opportunity to sit with Thomas S. Knudsen, SVP, Head of Marine Low Speed and CEO of Denmark, MAN Diesel & Turbo, to discuss the ubiquitous engine maker's current position and future prospects in the LNG fueled market.

By Greg Trauthwein, Editor

While the notion of LNG as fuel is hardly new in maritime circles, adoption is still relatively small but continues to gain steam in this and other industries as LNG helps to provide compliance with ever stringent environmental regulations, and a gives a tidy economic savings given the current price differential between LNG and traditional marine fuels.

While the environmental and economic promise of LNG is substantial, hurdles remain; specifically the ready availability of the fuel as well as a number of questions regarding the efficient handling of the fuel in the marine environment. "The big issue is the bunkering," said Thomas S. Knudsen, SVP, Head of Marine Low Speed and CEO of Denmark, MAN Diesel & Turbo. "If a big containership comes, it will empty all of the bunkering facilities that we have in Europe: One big ship will empty it. Huge bunking facilities will have to be made in the harbor or via a lightering vessel. That is the big obstacle, and the reason the big container companies have not taken this up yet."

With every passing day though, there is seemingly another announcement of a new order for LNG-fueled commercial vessels, helping to make the hurdles fall

faster. "We have run this engine in Japan for 20,000 hours with excellent results," said Knudsen. He was in the U.S. earlier this year to help further gauge the market potential, a potential driven in large part by the entering to force of the North American Emission Control Area (ECA) last August. "I see that we have a good business opportunity here in the U.S. This is the beginning of the boom in the LNG shipping here in the United States, and there is no doubt that this wave will continue in strength."

Times, They are a Changin' ...

In addition to the North American ECA and tightening environmental regulations for ship emissions globally, another major driver for the push to LNG is the potential economic benefits due to the ever-increasing discovery and recovery of shale gas – driven by North America but felt globally.

"Following several years of stronger-than-expected North American supply growth, the shockwaves of rising U.S. shale gas and light tight oil (LTO) and Canadian oil sands production are reaching virtually all recesses of the global oil market," is how the International Energy Agency succinctly put it, the opening line in its latest report dubbed "*Oil: Medium-Term Market Report 2013*."

North America, Asia, and South Africa are the shale gas resource leaders, and according to GL Noble Denton, the growth has been dramatic, with shale gas accounting for 1% of U.S. natural gas production in 2000; rising to 20% by 2010 and projected to increase to 46% by 2035. "In the old days, LNG carriers typically had a high boil off rate, so this fuel was considered free and nobody really discussed efficiency," said Knudsen. But today LNG carriers have lowered the boil off rate and the fuel is no longer "free." This, combined with the new discoveries and price differential between diesel and LNG has literally opened the door for what is broadly termed a revolution in marine power.

"From our side, the LNG Revolution is as similar as going from Coal to Diesel Engines. Of course the transition will take some time and it will be slow in the beginning," Knudsen said. "But we believe that here in the U.S. that it will actually be very, very fast. But there is no doubt that this will revolutionize shipping."

Another factor driving interest in the U.S. is the fact that gas prices fluctuate wildly on the global market, a factor that perhaps will stabilize as the shale-gas market matures and the U.S., as is expected, becomes a major net exporter

of gas to global markets. "At the moment we do not have a global gas market," Knudsen said. "The price level of gas, for example in Japan, is significantly higher than the price level of heavy fuel. But in the U.S. gas is cheaper than heavy fuel oil, and that will only increase the incentive to the ship owners to make this transformation."

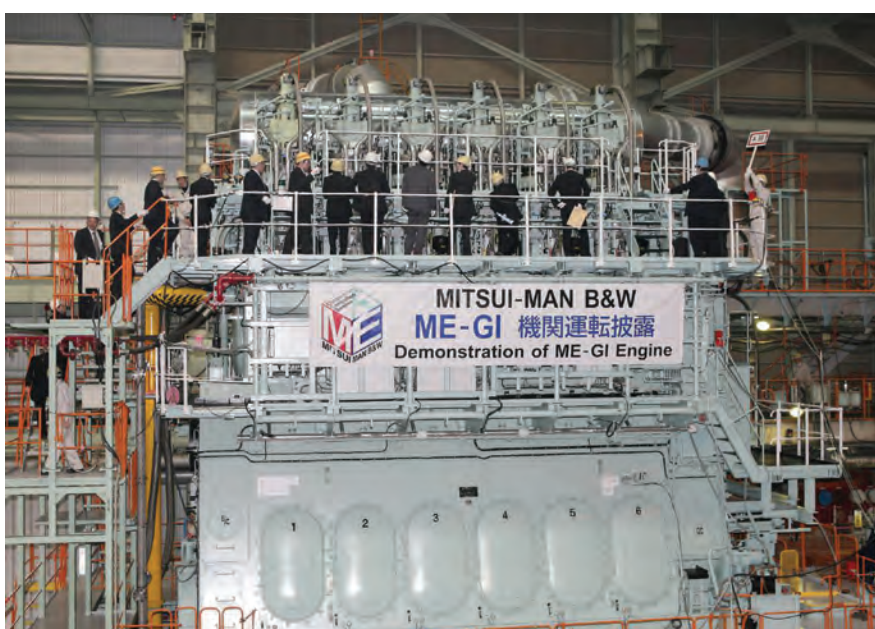
Expanding R&D

For any power plant manufacturer, a healthy R&D budget is essential not simply to prosper, but to survive. Legislative demands, much to the chagrin of the shipowning community, continues to drive innovation and expense across the entire maritime operation. Knudsen concurs: "It (new mandates) costs a hell of a lot of money. The new environmental rules account for more than 60% of our R&D effort." But while shipowners continue to lament legislatively driven expenditures, Knudsen said that it doesn't necessarily change the competitive field, as the rules are the same for all. Today, Knudsen said the company has an R&D department in Copenhagen numbering 200 strong, versus a crew of 40 when he started with the company. Predictably, a primary focus is developments in regards to Tier III engines.

"We have had massive investments

“From our side, the LNG Revolution is as similar as going from Coal to Diesel Engines. Of course the transition will take some time and it will be slow in the beginning. But we believe that here in the U.S. that it will actually be very, very fast. But there is no doubt that this will revolutionize shipping.”

Thomas S. Knudsen, SVP, Head of Marine Low Speed and CEO of Denmark, MAN Diesel & Turbo



Scenes from Japan of the ME-GI engine and its demonstration at Mitsui's Tamano works.

and made many developments, so we are ready; but we need to test it and to prove that our design is without flaw.”

In addition to the newbuild market, Knudsen maintains that the demand for refits will be powerful as well. “You will not lose any efficiency and you will not lose any power (when refitting a diesel engine for LNG fuel),” Knudsen said. “Modification on the engine itself is relatively small. The biggest part of the investment is the fuel tanks and the fuel supply system.” Generally speaking, the size of the LNG fuel tanks are three times the size of the tanks on a similarly powered diesel engine ship, and building space for the larger tanks is one of the most important considerations for both the refit and the newbuild sectors.

ME GI: The Time is Now

One of MAN Diesel & Turbo's oldest licensees held a demonstration of

the ME-GI concept on April 17, 2013 at its Tamano works, where guest viewed the engine and were able to listen to the company's leadership – specifically MAN Diesel & Turbo's Dr. René Umlauf, CEO, and Thomas Knudsen spoke to describe the impact of the new engine on the marketplace.

“Dual-fuel engines are tailored perfectly to these demands,” said Dr. Umlauf. “When operated in gas mode, CO₂ and nitric oxide emissions are markedly reduced, while sulfur oxides, soot and particle emissions are virtually non-existent. Additionally, dual-fuel engines give ship owners and operators tremendous flexibility and cost-efficiency, since the fuel can be changed based on its availability and price.”

Knudsen spoke of his pride in the result of many years of joint effort between Mitsui and MAN Diesel & Turbo and also referenced the first GI engine

that was developed in Tamano and later entered service, producing electricity for the Tokyo area. He called the demonstration of the 6S70ME-C-GI engine another visible sign of the high entrepreneurship and innovative capability of Mitsui.

“With this technology, Mitsui and MAN Diesel & Turbo will be able to supply the most environmentally friendly and most economical propulsion plants for not only LNG carriers but also VLCCs, container ships, RoRo ships, bulkers and other ship types,” Knudsen said. The ME-GI technology is a traditional two-stroke engine technology that can be maintained and overhauled by chief engineers already capable of maintaining existing two-stroke engines.

Unveiled in May 2011, the ME-GI engine is designed to give shipowners and operators the option of using either HFO or gas – predominantly natural gas but also LPG and methane.

Mitsui is the second MAN Diesel & Turbo two-stroke licensee to demonstrate the ME-GI concept after Hyundai did so in Korea in November 2012. Shortly afterwards, TOTE ordered two 8L70ME-GI engines to power two 3,100 TEU newbuilding container ships, with an option for three additional vessels. That announcement officially designated as ME-C-GI (M-type, Electronically Controlled, GI for Gas Injection) in the MAN Diesel & Turbo low-speed portfolio. The following month, MAN Diesel & Turbo was able to confirm the successful introduction of the ME-GI to the market with the announcement of another order when Teekay LNG Partners L.P. (Teekay LNG), an offshoot of Teekay Corporation, the international shipping group, placed an order for two LNG carriers powered by 2 × 2 5G70ME-GI engines, including an option for three further ships.





Are our Ports Safe?

A Hodgepodge of Maritime Security Laws Come into Question

Two recent reports have raised alarms about the security of our ports and the cargo that enters them by containers every day. The top North American container ports handle more than 35 million containers per year bringing vital goods to U.S. homes and companies every day. Without this freight, our economy would be at a standstill. But one nuclear device placed into a shipping container could wreak havoc not just at the port it enters, but also with the surrounding population of our busiest ports such as New York/New Jersey, Los Angeles, and Long Beach.

This article reviews those reports and asks whether the measures implemented by the U.S. adequately address the increasing concerns surrounding maritime port security, especially in light of the recent Boston bombing.

Discussion

Maritime security for the U.S. consists of a hodgepodge of laws, regulations and agencies responsible for making sure our ports and the cargo that enters it are secure. Since 9/11, Congress has passed a number of laws that address maritime security, including the Maritime Transportation Security Act of 2002, the Security and Accountability for Every Port Act of 2006 (Safe Port Act) and the 9/11 Commission Act of 2007. Authority to administer those laws falls under the Department of Homeland Security (DHS) and is divided between various DHS entities, including the United States Coast Guard, the Transportation Security Administration, FEMA (which administers the Port Security Grant Program), Customs and Border Protection (CBP), and the Domestic Nuclear Detection Office (DNDO), among others.

DNDO and CBP share responsibility for detecting nuclear materials that may be placed in a shipping container and enter the U.S. undetected. Earlier this year, in February 2013, DHS Inspector General (IG) issued a report on the state of the Radiation Portal Monitoring Program administered by CBP and DNDO. This report raised a number of serious questions about the program that is supposed to monitor and detect nuclear devices that may be placed on

board a ship entering a U.S. port. Under the Safe Port Act, all containers entering the U.S. at the 22 busiest ports must be screened for radiation. DNDO tests, acquires, deploys and provides maintenance for large-scale radiation detectors, called radiation portal monitors (RPMs), during the first year of operation; thereafter, CBP has the lead for operating and maintaining the RPMs.

The IG found that while there are 444 RPMs operating at seaports throughout the U.S., and all cargo is being screened, some RPMs were utilized infrequently or not at all. The IG also found the two DHS components, CBP and DNDO, do not fully coordinate or centrally manage the RPM program to ensure effective and efficient operations. In response to this critique, the agencies agreed to do better in the future.

The CBP has relied largely on a trusted shipper program, Customs-Trade Partnership Against Terrorism (C-TPAT), to ensure the safety of cargo being shipped into the U.S. from the largest ports around the world. Participation in this program is voluntary and its members include various groups within the maritime industry, including but not limited to shippers, ocean carriers, logistics providers, freight forwarders and manufacturers. C-TPAT has been effective in pushing the borders of trade and security outside the U.S.; however, its success depends largely on its members to conduct due diligence and ensure the safety of the cargo. This is because only a small percentage of containers bound for the United States, approximately four percent, are actually scanned overseas prior to entering U.S. ports. The remainders are simply screened.

In addition to the RPM Program and the C-TPAT Program, CBP has implemented the 24-Hour Advance Manifest Rule, which allows CBP to screen cargo before it is loaded in a foreign port on a vessel bound for the U.S. by requiring the electronic transmission of vessel cargo manifest information to CBP not less than 24 hours before the cargo is loaded on that vessel in the foreign port.

As the result of a Coast Guard and Transportation Security Administration initiative to improve security in the U.S. transportation system, the Trans-

portation Worker Identification Credential (TWIC) program was implemented in 2007. The TWIC program mandates the use of a tamper-resistant biometric credential issued to maritime workers, or other authorized individuals, to access secure areas of port facilities and vessels. The goal of the programs is, in part, to enhance security by determining those individuals eligible for authorized unescorted access to secure port facilities and ensuring that unauthorized individuals are denied unescorted access to secure port facility areas.

At the time the TWIC Final Rule was published in 2007, it did not require maritime owners and operators to purchase and install TWIC compatible card readers, however, through the course of a pilot program, it was anticipated that such card readers would eventually be in place. Six years later, the start-up period for card readers remains slow, with implementation of card readers mostly non-existent due to delays in developing card reader technology. This has resulted in criticism from the industry and the Government Accountability Office (GAO), which recently identified the program as flawed and proposed that DHS explore other alternatives.

Notwithstanding the ongoing criticism and delays, the Coast Guard is moving forward with this port security initiative, as evidenced by new rules proposed by the Coast Guard on March 22, 2013, which would require vessels and maritime facilities deemed high risk to install electronic TWIC card readers, rather than rely on visual inspection of the cards alone. Public comment on the proposed rules remains open until June 20, 2013, and with high level criticism from both Congress and industry members, the future of the TWIC program remains unclear.

Since 9/11, a debate has persisted whether all containers must be scanned for nuclear and other hazardous materials or whether the current process to simply screen a percentage of suspicious containers for harmful goods is adequate. The 9/11 Commission recommended that all containers be scanned. As a result, and in furtherance of this goal, Congress passed a law, the 9/11 Commission Act, which required 100% of containers to be scanned by July 1,

2012, and also granted the Secretary of Homeland Security authority to waive this deadline, for a period of two years at a time, under certain circumstances.

Since the implementation of the 9/11 Commission Act, DHS tested the 100% scanning requirement in enumerated ports such as Hong Kong, Oman, Pakistan, South Korea, and the UK, in a program called the Secure Freight Initiative. However, none of the ports were able to meet the 100% scanning requirement and still keep the cargo moving in an expeditious manner. As noted by DHS Secretary Janet Napolitano before the House Homeland Security Committee in 2012, the scanning requirement was neither practical nor affordable.

As a result, in May 2012, the Secretary officially granted a waiver of the requirement for a period of two years, as the law allowed her to do, thereby postponing the mandate that all inbound containers be scanned. In a letter to House and Senate Homeland Security committees, the Secretary noted that the extension was necessary because implementing the requirement at this time would "have a significant and negative impact on trade capacity and the flow of cargo." Additionally, she found that foreign ports lack the physical space and configuration for efficiently routing cargo through inspection stations.

Recently, in light of the Boston bombing, a number of maritime security experts have questioned whether the U.S. is doing enough to protect our seaports, the cargo entering those ports and the population from a smuggled nuclear device in a container. At a May 29, 2013 panel on "Nuclear Terrorism: What's at Stake", hosted by the American Security Project in Washington, D.C., as reported in "Security Management" (<http://www.securitymanagement.com/print/12510>), Dr. Stephen Flynn, a professor at Northeastern University, said that "smuggling through shipping containers is already happening on a daily basis, which demonstrates the possibility of a nuclear device, planted by terrorists to go undetected." His concerns were echoed by other panelists, including David Waller, the former deputy director general of the International Atomic Energy Agency (IAEA) and



(Photo: Alex Sergienko)

Rear Admiral (ret.) Jay Cohen, former Under Secretary of Homeland Security for Science and Technology. According to Waller, “[n]uclear material arriving at a U.S. port in a container, in all likelihood, has arrived from elsewhere, and [was] shipped undetected from elsewhere” making international cooperation “very important in securing our ports.” Cohen agreed that the nuclear threat was very real, stating that “[i]t’s only a question of where, when, and to what magnitude.”

What are the Administration and Congress Doing to Respond to the Threat?

Recently, the Administration has proposed merging all security grant programs into a block grant that would be primarily administered by the states. This block grant would include the port security grant program, known as the “Port Security Grant Program” (PSGP) administered by FEMA. This program gives grants to the highest risk ports to acquire equipment on a DHS approved list and awards grants for other port infrastructure improvements to further port security. The program was originally authorized at \$400 million a year

and funded largely at that level. However, the authorized and appropriated level of funding has declined substantially since 9/11 and the current 2013 fiscal year funding remains only at \$94 million, leaving scant resources to be divided among the major U.S. ports. This funding is directed towards the implementation of Area Maritime Security Plans (AMSP) and Facility Security Plans (FSP) among port authorities, facility operators, and State and local government agencies that are required to provide port security services.

The American Association of Port Authorities (AAPA) has objected strenuously to both the block grant approach and the reduction in funding. In a May 14, 2013 letter to the leadership of the House Homeland Security Appropriations Subcommittee, AAPA stated that “[o]ur economy, our safety, and our national defense depend largely on how well we can construct and maintain a security infrastructure at our ports,” and urged the Subcommittee to increase Port Security Grants to prior years’ funding levels.

On June 7, 2013, the House passed H.R. 2217, the Homeland Security Appropriations bill for FY 2014. The bill

reduced overall funding for DHS by \$617.6 million below the FY2013 enacted level, and \$34.9 million below the President’s request. On the House Floor, Congresswoman Julia Brownley (D-CA) offered an amendment to cut, then add back, \$97.5 million for port security grants to stress the importance of these grants. Her amendment was agreed to. Subsequently, the White House advised Congress that the President will veto H.R. 2217 because it reduces funding for the Department and is not part of an overall budget for FY2014. The White House did credit Congress for giving some additional flexibility to the Secretary in allocating grant funds.

Conclusion

Ports are certainly more secure than they were before 9/11. But since 9/11, we have also lost sight of the critical role ports play in our economy and transportation system. Funding on port infrastructure and port security has steadily declined. And, in some ways, port security has been the stepchild of our transportation security program. Yet, one nuclear device smuggled into a container and into a U.S. port could

wreak devastation on that port, the surrounding community, and our economy. The Congress and Administration should work together to improve funding for port security and port infrastructure and to ensure closer coordination among the responsible agencies, giving thought to creating a lead agency in DHS for port security and in the Department of Transportation for a new port promotion agency.

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LNG Fueled Vessels

Alternative to Diesel Strengthens as Barriers Continue to Fall

From the earliest days of mechanically propelled ships, fuel use has been evolving. Starting with wood, fuel changed to coal, which held sway for many years. Oil began to be used in the late nineteenth century and was clearly the dominant marine fuel of the twentieth century. Environmental shortcomings of fuel oil, particularly traditional heavy bunkers, were brought under increasing scrutiny as the twentieth century came to a close. As air emission regulations became more strict and petroleum costs increased, ship owners and operators began searching for an alternative fuel. Consideration may be given to non-fossil-fuels, but all have practical drawbacks. Among the available fossil fuels, natural gas is the cleanest – and the price has been dropping in recent years.

Natural gas is composed largely of methane (at least 90%, with the remainder being primarily ethane, propane and butane). Methane is the most basic of the hydrocarbons, being composed of one atom of carbon and four atoms of hydrogen – CH₄. On combustion, it turns into carbon dioxide and water. Commercial natural gas contains minimal amounts of extraneous substances, such as sulfur and nitrogen, so there are few pollutant byproducts.

Due in large part to fracking and horizontal drilling, the market price of natural gas has plummeted. The combination of environmental compliance requirements and decreasing price are making LNG an attractive alternative fuel for ship propulsion. Actually, the engines burn natural gas, not LNG – the LNG has been returned to its gaseous state as natural gas in the process of moving from the LNG fuel tanks to the engine's combustion chamber.

A problem with natural gas, though, is that, because it is a gas, it occu-



Harvey Gulf has contracted for a series of six dual-fuel offshore supply vessels (OSVs) intended to operate primarily on LNG. Its competitors in the Gulf of Mexico are taking note.

pies a very large space. If cooled to -162°C, it becomes liquefied natural gas (LNG) and occupies one-six hundredth (1/600th) as much space. In this state, it becomes practical to store and transport for use as a fuel.

Currently, the major drawback to use of LNG as a marine fuel is the lack of infrastructure. There are relatively few places in the world where a marine vessel powered by LNG can conveniently refuel (bunker). This is changing, and rapidly. An increasing number of sea-going vessels are being built to operate on LNG, either exclusively or as part of a dual-fuel arrangement.

Norway was the incubator for commercial use of LNG as a marine fuel and remains its epicenter.

The fish food carrier Høydal is apparently the first sea-going vessel to use LNG as its sole fuel for propulsion. The 2,692 gross ton cargo ship entered

service on June 20, 2012 carrying fish products for the Norwegian fish farming industry. In May 2013, its owner, Eidsvaag AS, took delivery of a second LNG –powered fish products carrier, Eidsvaag Pioner, constructed on an En-vironship design.

On October 23, 2011, the product tanker Bit Viking reentered service along the Norwegian coast following its conversion to dual-fuel operation. Primarily, it utilizes LNG from two 500 cu. m. on-deck tanks. If necessary to extend its range, the Bit Viking can use traditional marine diesel oil. The vessel's owner, Tarbit Shipping AB, expects a reduction of NO_x emissions of 90%, a reduction of SO_x emissions of 100%, a reduction in particulate emissions of 99%, and a reduction of carbon dioxide emissions of 20%. LNG bunkering is being done at the Skangass fa-

cility located at Risavika, Norway.

The platform supply vessel Island Crusader, delivered in May 2012, operates on LNG as it services facilities on the Norwegian continental shelf, using lean burn gas engines. It is also equipped with two diesel engines for use when it is necessary for the vessel to extend its range. Its LNG-powered sister ship Island Contender was delivered in October 2012. LNG-powered tugs for use in Norwegian ports are under construction.

LNG as a marine fuel is also entering the market in other European nations. In Finland, the ferry Viking Grace uses LNG as it transits between Turku and Stockholm. On March 20, 2013, Shell Shipping & Maritime launched in the Netherlands the world's first powered barge fueled exclusively by LNG. The tank barge will be used to deliver petroleum products to customers on the

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Rhine and its tributaries in the Netherlands, Belgium, Germany, and Switzerland.

Lauro Shipping in Italy has contracted to acquire several LNG-powered passenger/automobile ferries for use in the Mediterranean. A high-speed passenger/automobile ferry is undergoing sea trials prior to use by Buquebus on its route between Buenos Aires and Montevideo. Another passenger/automobile ferry is under construction for operation on the St. Lawrence River by Société des traversiers du Québec. In Vancouver, BC Ferries is considering conversion of some of its ferries to LNG fuel.

The United States is now set to become active in the use of LNG as a marine fuel. Harvey Gulf has contracted for a series of six dual-fuel offshore supply vessels (OSVs) intended to operate primarily on LNG. Its competitors in the Gulf of Mexico are taking note. Totem Ocean Trailer Express (TOTE) is converting two of its container ships that trade between Puget Sound and Alaska to operate on LNG. It is also having two new LNG-fueled container ships built for trade between Jacksonville and San Juan. When placed in service, these will be the largest ships using LNG as a fuel, but they will probably not hold the record for long.

On May 6, 2013, Interlake Steamship Company of Middleburg Heights, Ohio announced plans to convert its fleet of vessels to operate on LNG. Similar transition is under consideration for the Staten Island ferries, operated by the City of New York, which recently disclosed plans to convert one of its ferries to LNG fuel. Horizon Lines is in the early stages of converting two of its container ships to operate on LNG fuel.

On May 28, 2013, the Washington State Department of Transportation (WSDOT) issued a notice stating that Washington State Ferries (WSF) is exploring an option to use LNG as a source of fuel for its six Issaquah Class ferries. WSF expects a fuel cost savings of 40-50% by moving from marine diesel fuel to LNG. WSF has received conceptual approval from the U.S. Coast Guard to retrofit the propulsion system with new engines on the six Issaquah Class ferries to use LNG as a source of fuel.

For those owners not quite ready to make the leap into the LNG marine fuel marketplace, naval architects and marine engineers are designing LNG-conversion-ready ships. As their designation implies, these ships will be easily converted to operate on LNG marine fuel when their owners make the decision. NASSCO Shipbuilders in San Diego recently announced that it entered into a contract with an affiliate of American Petroleum Tankers for design and construction of four

50,000 DWT LNG-conversion-ready product tankers. The engines will be capable of dual-fuel operation and the design will include accommodation for an LNG fuel system.

Recognizing growth of the market for LNG as a marine fuel, Shell Oil Company recently acquired the Norwegian LNG fuel company Gasnor and announced plans for construction and operation of LNG bunkering facilities in the Gulf of Mexico region and in the Great Lakes region (by means of a natural gas liquefaction unit to be constructed at Sarnia, Ontario and with distribution capabilities throughout the Great Lakes and on the St. Lawrence). Harvey Gulf announced plans to construct and operate an LNG bunkering facility in Port Fourchon, La. Press reports indicate that Shell recently signed a letter of intent for joint operation with a Chinese energy company of an

LNG distribution and transfer station at Nantong port, just north of Shanghai. Plans call for LNG bunkering of ships operating on the Yangtze River and waters adjacent to Shanghai. Other energy companies are analyzing market opportunities.

As the landscape changes drastically, an area not receiving much attention is the indoctrination of management-level shipping personnel so that they can make informed decisions regarding whether LNG is an appropriate marine fuel for their situation. There are many factors to consider in both the macro and micro perspective. If the decision is made to include LNG in a company's fuel mix, the personnel who will actually be involved in the bunkering and use of LNG will also need training.

Take action now, because, as Bob Dylan famously sang, "The times they are a-changin'."



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Eliminating Waste Water Discharge

A New Approach to CWA/NPDES Requirements

Stephen F. Hinton, REM, CEA, ECS, Vice President for Environmental Affairs, Marisco, Ltd. and **Mark Howland**, Hawaii Business Developer and Program Manager, URS, are co-designers of the 3PF System.

Environmental professionals in industry are tasked with the unenviable responsibility of managing the delicate balance between compliance with ever-increasing and at times mind-numbingly complex and stringent regulations and maximization of production efforts. Consequently, Environmental Compliance Officers are perpetually on the hunt for alternatives to costly process controls and best management practices designed to mitigate potential negative impact. Requirements of the Clean Water Act and associated National Pollutant Discharge Elimination System serve to illustrate how daunting the proposition of this balance can be and further present the need for con-

stantly evolving technology in the quest for cost-effective options. In fact, effluent limits on process water discharges in permits issued under the latter have historically proven to be so rigid as to hamper even basic industrial processes to the extent that any type of traditional engineering controls have been rendered ineffective. Subsequently, these limits have been both scientifically and legally challenged, albeit to no avail. In the course of the settlement of a civil action brought by EPA involving, among other issues, its process effluent, a shipyard in Hawaii has developed new technology that is generating a paradigm shift where the approach to waste water discharge is concerned in this context.

Marisco, Ltd. is Hawaii's largest privately owned shipyard, employing upwards of 125 workers during peak production cycles at Barber's Point Harbor and at Pearl Harbor, both on the island of Oahu. For much of the last decade, reported concentrations of constituents of concern in dry dock effluent generated at the main facility, most notably both copper and zinc which can be found in anti-foulant paint systems applied to vessel hulls, have proven problematic for the company in consideration of limits imposed by its NPDES permit. This condition has been particularly puzzling to the environmental staff within the organization given both the level to which engineering controls have historically

MARISCO, Hawaii's largest private shipyard, was the proving ground for a new test eliminating waste water discharge.



been applied and in light of the results of sediment characterization and ambient water quality studies conducted by Marisco that seem to indicate no presence of any negative impact from its industrial activity. Nevertheless, based in part on the content of its monthly discharge monitoring reports, Marisco has been the object of two actions filed by both the state and by EPA. The most recent of these, the result of a compliance evaluation conducted in December of 2008, was just settled last week.

During settlement negotiations, Marisco attempted to explain apparent copper and zinc concentrations as the result of flawed sampling protocol that had been recommended by the state, citing it as too narrowly defined to allow for representative sample procurement. The company consulted with professionals from URS in the design of a new sampling and analysis plan. The resulting concentrations, while considerably lower than those obtained under the states plan, still did not attain permit limits. Although it seemed obvious at the time that paint overspray was the likely source of the problem, company officials were unable to identify at what stage of application any breach of containment might be occurring and therefore where BMPs needed to be modified. Further, the notion that studies had failed to identify significant levels of any pollutant reaching the harbor was still perplexing. The fact remained, though, that there were readings indicating levels present in effluent that appeared to violate permit conditions and that Marisco could not continue to operate under these circumstances. It was time to research and develop an alternative.

In a concerted effort to rise to the challenge and in one to foster effective collaboration between regulatory authority and the regulated community that is at the core of the National Environmental Policy Act, Marisco consulted further with URS and with EPA to develop a system that would eliminate its discharge entirely. This system is composed of two major components. The first of these involves a three-stage dry dock deck fresh water wash down. The second is the collection of residual water into a closed-loop process called the Portable Passive Precipitation Filtration System or 3PF, capable of treatment to below permit standards and then retention for re-use in the process. Given this proposal, EPA granted conceptual approval and allowed a period of time for design and development which is still underway, but to date results of test-

ing both the efficacy of the deck wash down and of the filtration processes have been very encouraging, and the original design of the filtration unit has received an honors award for excellence in engineering from the American Council of Engineering Companies Hawaii. EPA has indicated that after the current phase of system optimization that the agency will consider a request for permit modification eliminating the requirement for effluent sampling.

Concept Development

The intent was that the conceptual design should address the following:

- Treatment efficiency to ensure compliance with current NPDES limits for discharge.
- Development to target pollutant such as copper, zinc and TSS.
- Filtration at a rate that ensures thorough removal.
- Consideration of site restraints requiring the need for portability.
- Examination of construction, operational and maintenance costs.

Shipyards and their dry docks are industrial areas characterized by activities such as abrasive blasting, metal cutting and painting operations. Dry dock effluent and general shipyard storm water discharges can therefore be thought of as potential pathways for relatively high concentrations of metals, intermediate concentrations of solids and low concentrations of oil and grease. The first line of defense in keeping such potential pollutants from reaching receiving waters is the implementation of BMPs which apply operational improvements and source control technology to prevent discharges from attracting blast grit, paint chips, oil, and other potentially contaminating materials. As discussed earlier, Marisco developed a BMP suite for such control, but those alone proved insufficient to allow the shipyard to meet effluent criteria for direct discharge to surface waters as even hard to capture fine particles of dust can contain concentrations of pollutants.

URS began its research with a review of the testing results from dry dock effluent analysis primarily for copper and zinc. Copper concentrations were found in a range of 9 to 630 µg/L with an approximate average of 400 µg/L. In the case of zinc, effective concentrations were observed in the range of 11.4 to 390 µg/L with an average of 190 µg/L. The design criteria for the treatment system were therefore set to address a constituent concentration of 500 µg/L for copper and 250 µg/L for zinc.

There is a variety of technologies for

removing metals from process waters. Those include chemical precipitation, electrocoagulation and sedimentation. Effectiveness for all is dependent on the media used as well as flow characteristics through that media. For example, sand can be quite effective in the removal of particulates but is not at all effective for metals in dissolved phase. Organic-based filtration can provide enhanced treatment of dissolved metals by adsorption but is more effective on some chemical constituents more than others. The results of technology review conducted by URS indicated the need for a combination portable treatment structure to be used for full-range effective treatment of all constituents.

A study of various drydock facilities and shipyards on the West Coast of the U.S. found that they commonly use pas-

sive sedimentation, and that of facilities on the East Coast found that techniques of precipitation are most often employed there. A report from the Engineering Research Center of the University of Maryland titled "Removing Heavy Metals from Wastewater" outlined the precipitation process and cited its effectiveness. West Coast publications that advocate passive filtration agree that while the precipitate process is effective, they cite the expense associated and suggest that it is only effective to approximately 65 – 75% removal. URS' design parameters therefore were established to incorporate both the precipitation process as well as passive filtration methods.

Assuming a reasonable value of 75% removal of heavy metals by the hydroxide precipitation process, which involves the application of caustic soda and co-

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Please note that Phase I involved only 45 minutes of treatment time while Phase II incorporated both 3- and 24-hour treatments.

The deck wash efficacy is merely to illustrate the effectiveness of deck washing and includes illustration of incremental reduction in copper and zinc concentrations with an ultimate measurement of non-detect in the compliance effluent sample.

agulants that create metal hydroxides, it is felt that additional treatment is needed to achieve a level of non-detect in analysis of storm water or industrial effluent. Comparison of West Coast passive filtration systems indicates a low range of 25 – 42% treatment efficiency to a high range of 94.5 – 98.2%. It was obvious that site conditions and pollutant loads vary from operation to operation and from location to location. The Pacific Northwest Pollution Prevention Resource Center cites more than 100 Pacific Northwest shipyards where passive filtration is used with consistent good results in these ranges in their report "Pollution Prevention at Shipyards." Thus, with the combination of precipitate processes and passive filtration methods, it was expected that the URS/Marisco 3PF System would have the capacity to achieve complete removal of target constituents, designed to effectively employ coagulation, precipitation, sedimentation and passive filtration to achieve State of Hawaii Department of Health regulatory levels of 2.9 µg/L for copper and 95 µg/L for zinc.

To test and evaluate the design, URS and Marisco assembled a tabletop unit. Built to scale, this model incorporated all of the components of the intended full-scale model and was constructed at Marisco's dry dock location to receive waters from the wash down process containing copper and zinc. Marisco discontinued implementation of other BMPs during vessel maintenance to create a worst-case scenario as can be seen in the system influent levels in the compiled data below. Two testing regimes were conducted, and analysis on samples was executed by an accredited laboratory. Results in-

MARISCO, LTD. 3PF System Test Phase I Results

Sample ID	Representing	Result pH (Std. Units)	Result Cu (Ttl. µg/L)	Result Zn (Ttl. µg/L)	Result Cu (Dis. µg/L)	Result Zn (Dis. µg/L)
DeckWash Resid From Deck A	First Deck Wash	7.90	8800	7700	730	990
Deck Wash Resid From Deck B	Second Deck Wash	8.26	340	280	22	ND
Deck Wash From Tote	System Influent	8.33	5200	3700	920	580
3PF Treated Wash Resid	System Effluent	10.6	140	90	45	80
Undock Punapau	Compliance	8.21	ND	ND	n/a	n/a

Reduction in Ttl. Cu from deck wash – 93.5%	Reduction in Ttl. Cu from treatment process – 97.3%
Reduction in Ttl. Zn from deck wash – 92.4%	Reduction in Ttl. Zn from treatment process – 97.6%
Reduction in Dis. Cu from deck wash – 97.6%	Reduction in Dis. Cu from treatment process – 95.1%
Reduction in Dis. Zn from deck wash – 100%	Reduction in Dis. Zn from treatment process – 86.2%

MARISCO, LTD. 3PFS Test – Phase II November 23, 2012

Sample ID	Result pH (su)	Result Cu (Ttl. µg/L)	Result Zn (Ttl. µg/L)	Result Cu (Dis. µg/L)	Result Zn (Dis. µg/L)
System Influent	8.10	1,700	2,100	120	120
System Effluent (3-hour)	10.9	ND	23	ND	ND
System Effluent (24-hour)	12.5	ND	ND	ND	ND

MARISCO, LTD. Deck Wash Efficacy Test – Phase I

Sample ID	Result pH (su)	Result Cu (Ttl. µg/L)	Result Zn (Ttl. µg/L)	Result Cu (Dis. µg/L)	Result Zn (Dis. µg/L)
First Deck Wash	7.88	28,000	18,000	870	1,000
Second Deck Wash	8.47	1,500	710	74	29
Third Deck Wash	8.38	50	110	ND	ND
Compliance Ambient	8.07	29	ND	NA	NA
Compliance Effluent	8.12	ND	ND	NA	NA

dicating success in attaining non-detect levels are available for review upon request.

How it Works

One wash cycle of the dry dock generates approximately 1,500 gallons of residual wash water. The three stages then produce approximately 4,500 gallons, so the capacity of Marisco's custom designed unit would be approximately 5,000 gallons. In general, the 3PF System is segmented, with the use of baffles into a chamber for precipitation, one for sedimentation, and a discharge chamber. System influent generated by collection from the dry dock after washing is initially treated by an oil/water gas separator energy flow diffuser to remove floatables and large particles such as paint chips or rusted metal clamps. The water then is conveyed into the first internal chamber of the system – the precipitation chamber – where a sheet flow facilitated by a perforated pvc "sprinkler" piping system spreads it out over a screen holding a bed of pH adjuster to ensure complete introduction to turn the solution caustic and to increase alkalinity to above a pH of 7.0 su. There is some immediate precipitation of heavy metals from metal hydroxides solids at this stage.

To ensure that solid metal hydroxides form, a coagulant of organic polymers is presented to aid in particle formation. A second screen located below the pH adjuster screen is coated with these coagulants. These two screens will both be required to be removed and recharged after each complete process treating approximately 4,500 gallons.

The remainder of the system hosts the sedimentation chamber and the discharge chamber. The sedimentation chamber is simply a section for the wash water to accumulate and to stagnate. Here, heavy metals still in suspension and late-forming metal hydroxides will begin a process of sedimentation. Materials that are used as attractive force to ensure sedimentation are on the base of the system.

The last stage of the portable treatment system is the discharge chamber. Again, separated by an internal baffle, the area generates a volume that has been precipitated and filtered by sedimentation that rises via capillary action to a point at this end of the vault where it can be extracted to a holding tank that will now contain clean water ready for re-use.

For effective operation, it is envisioned that the technology proposed can be applied over a three-hour period but can be optimized over a 24 hour period. There will be no harm in allowing the process to continue during non-use periods. If

additional clean water is needed for the next wash cycle, the water in treatment can simply be transferred to the clean water holding tank as needed.

Additionally, it is recommended that any yard areas exposed to storm water be bermed or constructed in such a manner

as to facilitate collection and introduction into the system for treatment.

From Table-Top to Prototype

To ensure that a full-scale model will respond in this manner, EPA has given Marisco fifteen months to allow for

ample dry dock activity to collect supporting data. During this time, while the company does not expect any major changes to original design specifications, it is anticipated that a few minor alterations will be necessary to attain system optimization.

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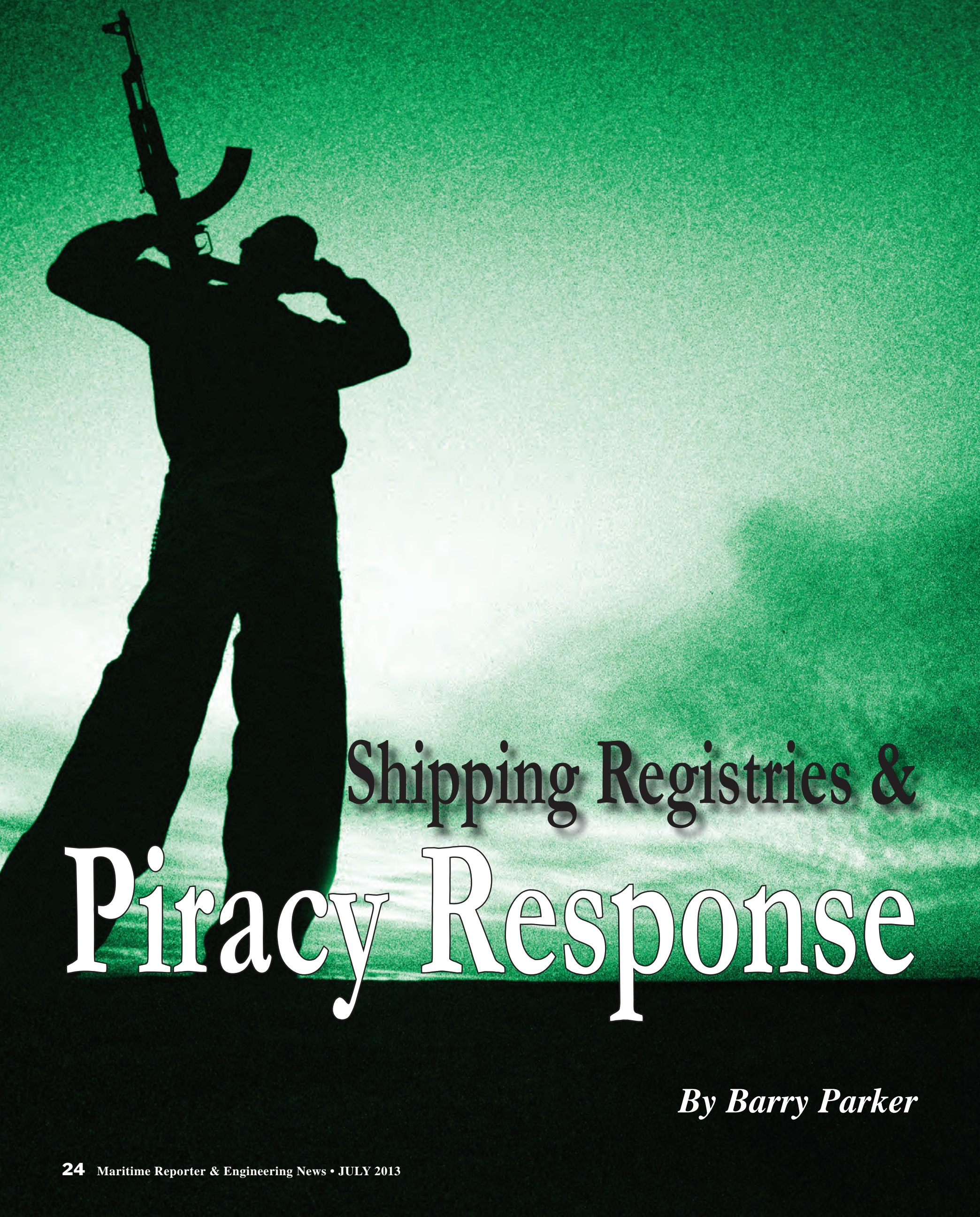
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Shipping Registries &

Piracy Response

By Barry Parker

International shipping registries have continued to sharpen their aim taken at a longstanding maritime problem: What is the appropriate response to piracy? As attacks have shifted from Somalia to West Africa, the issue remains at top of mind.

Armed guards have proven to be a successful deterrent against attacks. Ship finance and registry lawyer Brad Berman, a Partner at Holland & Knight (H&K), sums up a sea change in views over the past year in views about guns aboard ships, telling Maritime Reporter: "A few years ago most of the shipping industry was against having weapons aboard, with strong objections from some of the national registries. Generally, the open registry system had already begun to accept armed guards."

As Chairman of INTERTANKO's Associate Members and a member of Council, Berman recalls early discussions on the debate.

He said, "The Northern European owners were initially strongly against armed guards; while the "cowboy" politics of at least one North American representative were debated in the hallway. Now two years later, well trained, experienced armed security teams are openly accepted." Berman added.

"As the debate evolved, those Flag Administrations that explored the use of trained security teams found it imperative that the people with the guns were properly trained, had significant prior military experience and would be compliant with the rules."

Issues regarding contracted guards have evolved greatly since 2008. By 2011, a consortium of industry associations BIMCO, ICS, INTERCARGO, INTERTANKO, the OCIMF and the International Group of P&I Clubs prepared a set of guidelines regarding the use of private security contractors on board ships in the Gulf of Aden.

In 2011, a group of security providers created a standard setting and information sharing body, - the Security Association of the Maritime Industry (SAMI). "SAMI has been at the vanguard of developing standards in maritime security, and the SAMI Standard has been a significant foundation of subsequent developments," said Steven Jones, Maritime Director of SAMI.

Maritime security initiatives moved rapidly at the IMO, in contrast to the glacial pace of other regulatory initiatives. Ten years after the ISPS code, as concern about PMSCs (Private Maritime Security Companies) who provide PCASPs (Privately Contracted Armed Security Personnel) mounted, the IMO again moved quickly. The IMO's Maritime Safety Committee meetings in 2011

(MSC 89) resulted in Interim Guidance for Flag States and for ship owners on the use of PMCSs and PCASP's in high risk areas.

The IMO did not actually endorse the practice, saying instead, that "The carriage of armed personnel remains a matter of decision for the ship owner—after a thorough risk assessment—to request,

and the Flag State to decide." Around late 2011, two influential registries- the U.S. and the U.K. opened up the door to allowing armed guards on ships flying their colors, following the lead of white listed flag states Liberia and the Marshall Islands.

By the time of the May, 2012, meeting of the IMO's Maritime Security Coun-

cil (MSC 90), the IMO, both industry and Flag States- through the IMO, were working towards binding guidelines for PCASPs. SAMI's Jones explained, "The work of SAMI was covered in a submission to the IMO at MSC90, and a decision was ultimately taken to pass responsibility for developing a standard to the ISO."

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Will Watson, the President of security provider AdvanFort (based outside Washington, D.C.), told Maritime Reporter, “I believe that having the standard set through ISO was clearly the right course and saved months, if not years.” Watson offered a clarification, saying, “It must be said that the IMO played a role in the development of the ISO 28007 protocol.” He also credited BIMCO (representing the owners) and SAMI.

In late 2012, the International Standards Organization (ISO) unveiled its new specification, ISO/PAS 28007:2012, which can be linked to certifications under IS) 28000:2007, a standard for supply chains. The ISO explains, “The document addresses security management system elements such as resilience, planning, resources, training and awareness, communication and documentation. It outlines operational requirements for dealing with issues such as scene and casualty management, incident reporting and investigation, health and safety and customer complaints.”

It adds “ISO/PAS 28007 also includes recommendations for performance evaluation such as monitoring, audits, management and continual improvement. Implementation will help security companies demonstrate their ability to provide privately contracted armed personnel on board ships.”

SAMI’s Jones said, “The association

has taken an active role in the work to develop and launch ISO/PAS 28007.” He adds that SAMI’s membership decisions are still taken against the SAMI standard while the ISO certification process is refined, but ultimately entrance into SAMI will be granted to future members who are certified according to ISO/PAS 28007. He says that SAMI’s Certification partner, RTI, is on course to launch a pilot scheme for approving companies meeting ISO PAS 28007 requirements. “All the while,” he says, “... we have been working to ensure that our process will fit into the ISO structure.”

Watson suggests that the path through SAMI and the ISO allows fast-tracking because it steers around political shoals. He said, “Beginning some two years ago, SAMI had a plan to have a two stage approval process for PMSCs. The second step would have been essentially what later became ISO 28007. Now, SAMI still has State 1 certification that requires extensive vetting of PMSCs seeking the approval. Some of the leading PMSCs, including AdvanFort, have achieved this status.”

Flag States now accept the role of armed guards, with some embracing the ISO standards and some moving beyond them. The Marshall Islands has been working very closely with SAMI, and, early on had forged an MOU with the Registry aimed at furthering the best interests of both organizations, the mem-

bers and the industry at large. Jones said “SAMI has worked with the Marshall Islands since the inception of the association, and the MOU encompasses a range of areas of co-operation and support.” AdvanFort’s Watson characterizes Liberia and the Marshalls as “... offering extensive guidance to owners and operators on the best vetting process regarding PMSCs.”

Robin Townsend, from Lloyds Register, who has been the ISO’s project leader on piracy issues, said, “The latest development of the ISO 28007 has been introduced to the IMO by Marshall Islands so they are supporters.”

The Director of Maritime Security at the Liberian Registry, Jorgen Palmbak, wrote, in a recent bulletin, “Per IMO directive, ISO has developed an ISO standard (ISO/PAS 28007) that establishes criteria for selecting companies that provide armed guards for ships. Liberia supports this initiative, not least because it helps keep out rogue pirate-hunters, avoids self-regulation and provides owners with a means to select – and flag state administrations a standard by which to audit – security providers.”

Registries, ISO and Control

But some registries are not happy to relinquish control to the ISO. Watson said that Panama and Cyprus has two registries that have implemented their own in-house vetting and certification schemes.

He said that Panama was the first to do so, and recounted a trip to Panama where he met with Eng. Alfonso Castellero, General Director of Merchant Marine, adding that, “AdvanFort passed muster with Panama, and the Registry actually included some of our Quality Assurance Program (QAP) features in its scheme.”

Jones from SAMI, tells Maritime Reporter, “It is anticipated that a number of Flag States (including Germany, Panama, Cyprus, Belgium, Croatia, Greece, Malta, the Netherlands, Luxembourg, Italy, the U.K. and Japan) will eventually retain their own additional requirements and processes for state specific reasons.” This is borne out by recent news flashes.

In March 2013, Malta drafted legislation described as “...the first scheme for private maritime security licensing...” by lawyers Fenech & Fenech Advocates, posted on the blog of Neptune Maritime Security. In the lawyers’ posting, they explain that the requirements for private maritime security licenses “...list more than 20 obligations, and aim to ensure that those companies that obtain a license are suitable for such sensitive and demanding activity.” The criteria include implementation of a quality management system (QMS) The lawyers add, “The policy has been well received by private maritime security companies, which are determined to ensure that only the most serious service providers are allowed to operate.”

In late April, the State news service from the Netherlands, whose ships transiting near Somalia were benefiting from protection from the Dutch naval forces, announced that, “... the cabinet will draft legislation which will enable shipping companies to hire armed personnel from private security companies under strict conditions, which are yet to be defined, for the protection of specified categories of transport in the high-risk area near Somalia.”

In late May, David Rider from Neptune, an important blogger in the space, wrote, “As predicted, Germany has become the latest Flag State to adopt a national certification process for private maritime security companies seeking to place guards onto vessels flying their flag.” He adds, “... it must demonstrate how it will ensure the suitability and reliability of its directors and its employees, while insurance is also a key issue.”

In the U.K., an extra verification layer, the management accreditation agency United Kingdom Accreditation Service (UKAS) has been appointed to assess companies that have been certified to the ISO 28007 standard. MSS Global, a U.K. auditor specializing in private security, has announced that two PMSCs were selected for their Pilot Audit of Certi-



(Photo: AdvanFort)

Flag States now accept the role of armed guards, with some embracing the ISO standards and some moving beyond them.

“A few years ago most of the shipping industry was against having weapons aboard, with strong objections from some of the national registries ...

... Generally, the open registry system had already begun to accept armed guards.”

Brad Berman, ship finance and registry lawyer,
Partner at Holland & Knight (H&K)

fication for ISO PAS 28007 as part of the UKAS pilot project. According to MSS, Port2Port Maritime Security and Castor Vali Security Risk Management are now beginning their audit assurance process in accordance with ISO 28000 (supply chains) and ISO PAS 28007, as of Spring, 2013.

There is a role for Class Societies. For example, Lloyds Register Quality Assurance (LRQA) has joined forces with a specialized risk consultant, Integrated Risk and Security Solutions (which worked with LR previously, on the ISPS code); the joint venture will be assessing companies, under the UKAS pilot program. LRQA has also entered into a joint venture with Protection Vessels International (PVI), expected to start in June. The next frontier in maritime security will be workable and actionable rules- acceptable to the PMSCs (and to the array of other stakeholders) surrounding the use of force. A U.K. lawyer, David Hammond, who retired from the UK armed forces in early 2012, has been drafting a set of model rules, dubbed “The 100 Series”- the name purposely evoking Article 100, dealing with rights to a fair trial, from UNCLOS 1982. In an interview with MSS Global, Mr. Hammond said, “In my final in-Service role as an operational naval barrister I had seen many variations of PMSC RUF [Rules on Use of Force] cross my desk. Some were robust and well written, others less so. I therefore developed a concept based upon previous front-line experience, not just as an operator, but also as an advisory lawyer having


amongst other roles, assisted in drafting the Royal Navy’s Rules of Engagement for current Indian Ocean and Gulf operations.” He adds, “To date, there has not been a single internationally applicable model set of RUF against which PMSCs, home States, flag States and Registries, the insurance industry, ship owners and operators, including Masters and interested third parties, could compare and gauge the validity of the RUF that was being presented, both as part of a contractual agreement and in relation to that used during transits. There was no benchmark.”

However, as noted in a recent article by H & K’s Brad Berman, “The creation of private maritime security companies might be considered the modern equivalent of the issuing letters of marque in the 17th, 18th and early 19th centuries (historically, referred to as privateers). Letters of marque were legal decrees from a government allowing a vessel to arm itself against an attack. The privateer brought the prize vessel back to their port of origin to auction off its goods in Admiralty court. Privateers were an accepted form of defense against pirates and enemy flagged vessels in wartime on the high seas.”



Mindful of past legalities and current needs, Berman concludes, “A number of complex and difficult issues surround the piracy problem; each has an impact on the entire international shipping community. However, the resurgence of piracy is something that seafarers, shipowners and governments must address on today’s oceans. “



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IRS to Leverage R&D for a New Dynamic Role

By Joseph Fonseca

Attaining full membership of the International Association of Classification Societies (IACS) in 2010 appears to have opened a wider choice of opportunities for Indian Register of Shipping (IRS). Since Arun Sharma assumed charge as Chairman and Managing Director in February 2012, IRS has embarked on a trajectory of rapid expansion and growth, positioning itself in the new avatar of a solution provider for its clients, offering not just innovative solutions but assisting them with tailor made remedies for meeting their individual needs.

“Making a departure from its traditional role as a regulatory body, IRS is focused on a new approach,” said Mr. Sharma. “The traditional and primary role of Class will always remain - Safety of life and assets at sea, and protection and preservation of the marine environment. However, because of changing needs and demands of the industry, the role of Class also needs to change.”

IRS now seeks to provide services pertaining not only to Class but also those

beyond Class. In short, it has taken upon itself the responsibility of being a solution provider to its clients, and will make all efforts to ensure that some, if not all of the solutions provided will be extremely innovative.

As a member of the International Association of Classification Societies (IACS), IRS is committed to reducing GHG emission and protecting the environment by reducing the carbon footprint according to Sharma. In this regard, he explains that the society has put its Research & Development (R&D) efforts into overdrive in order to focus on enhancing efficiency on all three fronts viz ship engine, hull and fuel – the last being for better recovery of waste heat energy.

“IRS is focused on creating innovative solutions and cashing in on emerging technologies for use by clients to the best advantage,” said Sharma. “These are being looked at by the R&D department internally. We are in constant touch with the industry in order to find out what our stakeholders want. Our R&D operates on two fronts. Firstly, it looks to improving the present systems and to coming

up with new techniques and technologies that can be marketed. Secondly, it creates tailor-made solutions designed especially to meet the individual stakeholder’s needs. This innovative technology is on the top of our R&D agenda. In this regard, we have been recruiting senior people at different levels to boost our efforts and catch up with the demand from the trade.”

Having acknowledged and appreciated the efforts and achievements of IRS, the Government of India as well as other foreign Administrations have placed their trust and confidence in IRS often seeking its guidance and assistance.

IRS has also been getting much support and empowerment from the Indian Government in general and the Directorate General of Shipping (DGS) in particular on several matters. DGS has delegated several of its own functions to IRS and continues to add to this list. To mention a few, IRS has been made the sole authority in India for assigning Load Line, sole authority for the International Ship and Port Facility Security (ISPS) Code and International Safety Management

(ISM) Code.

The Government has also made IRS the sole authority for the Maritime Labor Convention (MLC) 2006. Since India has not ratified this Convention, IRS is issuing ‘Statement of Compliance’ so that ships are not subjected to PSC detentions. To date, IRS has already inspected 20 ships. Besides, IRS has also been appointed by Liberia, Marshall Islands and Sri Lanka for making similar certification.

“The Indian Administration has now authorized us to restructure the procedures for audits of Maritime Training Institutes,” informed an official of IRS. “As such IRS will be one of the organizations which will depute their representatives to inspect the various maritime institutes to determine whether these institutes meet the required standards in teaching engineering and nautical candidates or conduct various DG approved courses. In this regard, DGS examines the institutes through a set of appointed societies and IRS is one of them.”

It is heartening to note that the entire format for conducting the audits of mari-

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“The traditional and primary role of Class will always remain - Safety of life and assets at sea, and protection and preservation of the marine environment. **However, because of changing needs and demands of the industry, the role of Class also needs to change.**”

Arun Sharma, Chairman and Managing Director,
Indian Register of Shipping (IRS)



time institutes has been developed by IRS and presented to the Indian Administration. IRS was also retained by the Government to frame the Indian Coastal Rules and these have recently been completed and submitted to DGS last month.

IRS’s singular achievement is being appointed as the Recognized Organization (RO) of 22 flag registries, which include Panama, Liberia, Marshall Islands besides India, the latest being Marshall Islands. All these 22 registries constitute 80 percent of the world fleet tonnage. IRS today has more than 1,700 vessels registered with it totaling about 11.0 mil-

lion GT. Now that IRS has IACS membership the opportunities have improved significantly, it expects to see its growth mushroom.

Sharma said, “Our application for EU membership has already been forwarded through Bulgarian flag administration. EU has already initiated the process towards recognition of IRS.”

In conclusion, IRS firmly believes that as we move into time, the Class, the ship owning industry, shipyards and the flag states will need to work together in order to achieve the goals set out more expeditiously.

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Brazil Class

To understand how ABS and DNV participate in Brazil's complex and challenging Maritime and O&G industries, MR spoke to ABS's João Carlos Ferreira, DNV's Tommy Bjørnsen and their colleagues in Rio de Janeiro.

By Claudio Paschoa, Brazil

ABS Group

The American Bureau of Shipping (ABS) is a non-profit classification society founded in 1862. ABS has been present in Brazil for more than 40 years, with more than 200 employees distributed between six offices in Brazil.

"We have been providing classification services to the offshore industry longer than any other class society, and we are the current market leader in worldwide MODU classification and also market leaders in floating production units (FPU), more than 50% of the global overbook for FPSOs is being classified by ABS," said João Carlos Ferreira, Vice-President South American Region. "Our key areas in Brazil are Asset Integrity, Risk and Reliability and Naval Engineering. We are also present in a special feature of the Brazilian market, which is Local Content certification, being accredited by Brazil's ANP (National Petroleum Agency) for this purpose," he said. "Brazil is a growing offshore market with almost unlimited potential and we are working closely with companies involved to maximize this potential."

ABS is also working with Petrobras' R&D center CENPES, COPPE/UFRJ (Federal University of Rio de Janeiro) and other organizations on R&D efforts, local content certification, FPSO life

extension (FLEx) and more. Buoyed by Brazil's development and to leverage its global R&D resources, ABS established its Brazil Offshore Technology Center (BOTC) in Rio de Janeiro in 2009. Christiane Machado, Head of ABS's BOTC said, "We have been developing various projects for the offshore industry, such as FLEx, involving new rules and requirements for developing a continued operation protocol in order to extend FPSO operations while decreasing their need to drydock." Some other BOTC projects include Production Riser Connectors (2012-2013), Aging of Subsea Equipment (2013-2014), which involves accessing the level of safety threat posed by aging subsea equipment not easily substitutable, such as ESPs (electrical submersible pumps).

João Carlos Pacheco, ABS's General Manager in Brazil spoke about the challenges faced in the country. "ABS is directly involved in all aspects of the offshore industry in Brazil, be it pipelines and other subsea equipment certification or FPSOs and OSV classification, along with industry training and guidance. We are classifying deepwater drilling rigs for Sete Brasil (a Petrobras company), being built or to be built in five different Brazilian shipyards. These will be the first drillships ever built in Brazil." He

explained that there have been delays in the process of awarding these contracts and that these delays are part of the challenge of operating in Brazil, where bureaucracy commonly affects the duration of industry projects.

Sidney dos Santos Bereicoa, ABS's Director of Engineering for South America said, "ABS is committed to developing new concepts for the offshore industry in Brazil, such as Offshore GTL (Gas to Liquid) and we have given an AIP (Approval in Principal) for the technological concept." The GTL concept will permit associated gas to be processed without continuous flaring. This concept is being developed by partnerships between Petrobras and CompactGTL (A British company based Abingdon, Oxfordshire), this AIP was given by ABS Houston.

"This is a vital new technological concept as it permits operators to discontinue flaring which is wasteful and aggressive to the environment and at the same time transform the liquefied gas into sulfur-free synthetic crude, which can then be mixed with crude oil," said Sidney dos Santos Bereicoa. SBM will be including GTL modules in its new pre-salt FPSOs already ordered by Petrobras.

Another new concept underway in Brazil with ABS guidance is the Multi-Column Buoy concept being developed

by Petrobras' CENPES Technology Center. Sidney dos Santos Bereicoa pointed out that "Between 2012 and 2013 three FPSOs were classified and had equipment certified by ABS, these were FPSO Cidade de Anchieta, the FPSO Cidade de Itaja and FPSO Cidade de São Paulo."

ABS is also classifying another five pre-salt FPSOs and a variety of modules for pre-salt FPSOs, along with the TLWP P-61 and OSX-2 and 3, which are FPSOs for OGX fields at the Campos Basin, among other projects.

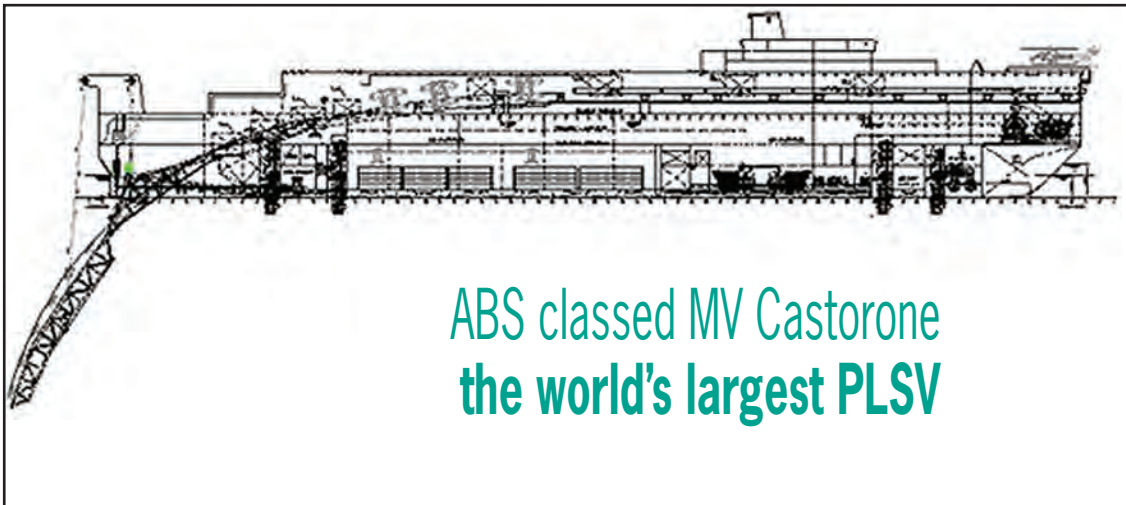
DNV

DNV was founded in 1864 in Oslo, Norway and has been present in Brazil since 1974, currently having 300 employees in the country. DNV has participated in numerous JIPs along with development projects aimed at Brazilian pre-salt E&P challenges. According to DNV's Director of Operations, Tommy Bjørnsen, a good example of a DNV led JIP was the project on recommended practices for horizontal drilling. "This JIP had the objective of evaluating and agreeing on a guideline for planning, engineering and execution of HDD (Horizontal Directional Drilling) for pipeline installation," said Bjørnsen. It had eleven participating companies, such as, Petrobras, Subsea7, Sinopec,

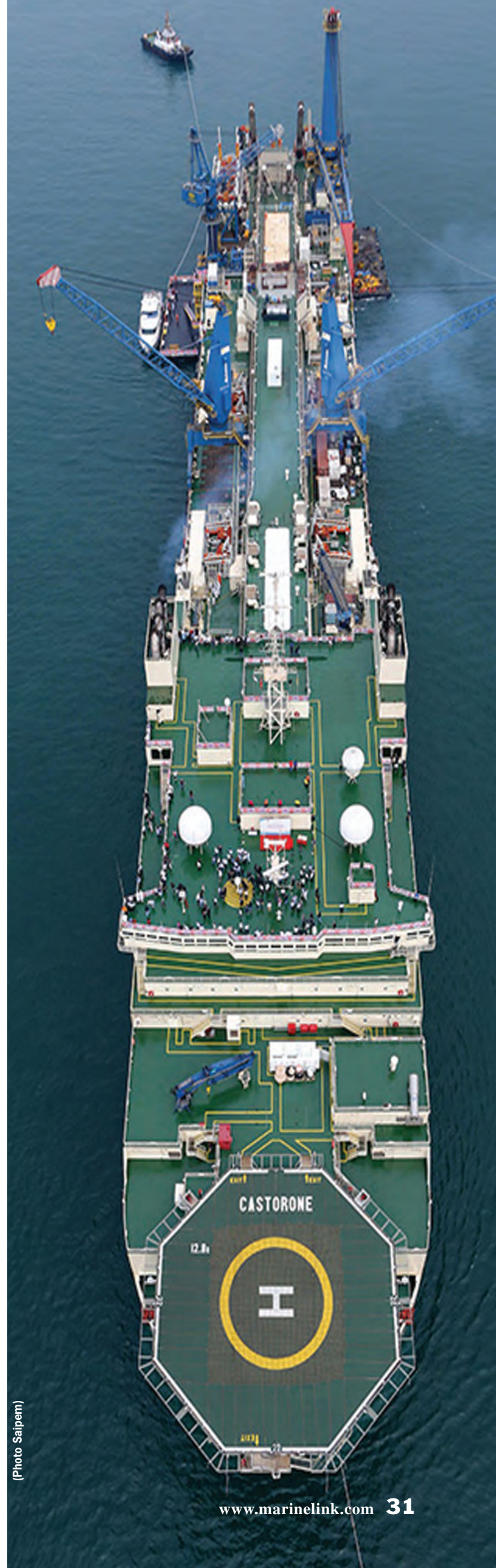


“Brazil is a growing offshore market with almost unlimited potential and we are working ... to maximize this potential”.

João Carlos Ferreira ABS's VP for South America



ABS classed MV Castorone
the world's largest PLSV



(Photo Saipem)



“DNV has been a main player in pre-salt development, with key deepwater riser system certification such as the Guar/Lula NE pre-salt riser system.”

Tommy Bjørnsen, DNV Director of Operations,

Below:
P 62 FPSO classified by DNV



Brasfix, DrillTec, Intech, Laney Drilling, Polidrill, Megadrill, MGI/Oceânica and Herrenknecht and was completed in December 2012.

Bjørnsen said that there have been delays in the development of some systems due to bureaucratic issues and that in other cases progress has been hampered by financial constraints of the companies involved. Yet he said this does not affect DNV's classification and certification, only affecting the time it takes to develop certain projects and get them functioning.

Other internally funded development projects have also contributed to advancing local industry technology, such as X-Stream, which is a pipeline installation concept to accommodate reduced pipeline wall thickness for deep waters. "This offers benefits like reduced steel quantities, and more pipe mills and pipe laying vessels being qualified and also allows for a significant CAPEX reduction. In particular, X-Stream will be highly applicable to the recent finds in pre-salt fields off Brazil, some located over 300km from the coast, posing a number of exploration and gas transportation challenges which can be attenuated through the new concept," said Bjørnsen.

In terms of offshore energy solutions, a good example is OPerA, which involves the concept of a floating power hub and an electrical distribution system capable of supplying power to a network of offshore installations. "This is interesting for the Brazilian offshore as it involves a shared, centralized power supply to improve logistics and decrease offshore power costs. The concept would also increase availability of deck space in rigs and FPSOs, while increasing power reliability to various offshore structures," Bjørnsen explained.

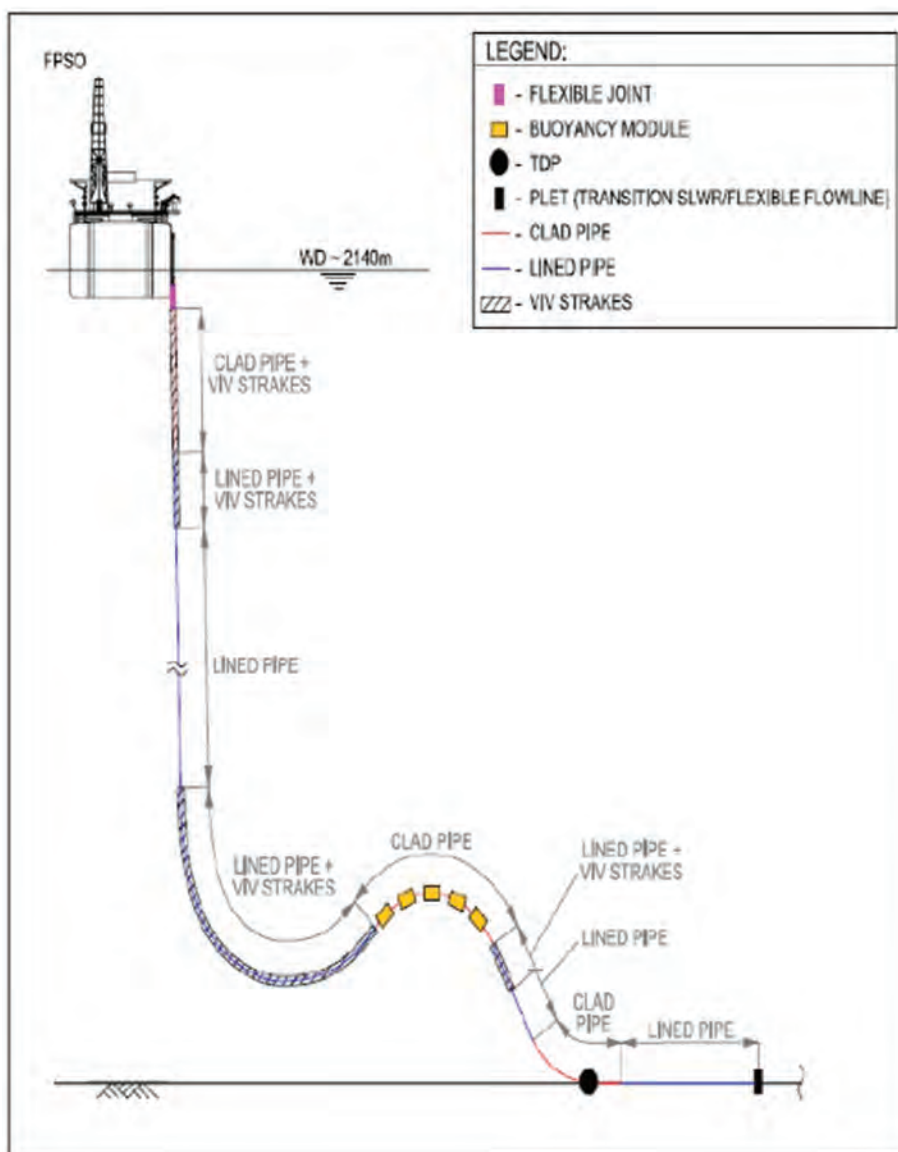
"DNV has been a main player in pre-salt development, with key deepwater riser system certification such as the Guará/Lula NE pre-salt riser system," said Bjørnsen. This system is composed of four submerged buoys with 32 tethers, 27 SCRs (Steel Catenary Risers), Production Clad lines (7.5 in.), WI Clad lines (9.5 in.) and GI lines (8 in.), 21 suction and 18 torpedo riser anchoring piles. DNV also certified the Sapinhoá pre-salt riser system, composed of 10 SLWRs (Steel Lazy Wave Risers), eight production risers, two gas injection risers, one FSHR (Free Standing Hybrid Riser) and a gas export riser system.

"A significant X-Stream study in Brazil is the JIP on Collapse Assessment of Offshore Pipelines with $D/t < 15$, which considers the problem of optimizing pipe wall thickness for a deep and ultra-deepwater pipeline while still

complying with strict safety and integrity standards," said Ana Paula França Santos, Senior Pipeline Engineer. DNV launched the JIP to assess the behavior of pipelines with low D/t and revisit the design equation and safety factors currently in use. "We are in the phase where the objectives are clear, the systematics are in place, but we want to capture more knowledge and experience. From this JIP, the recommendations and possible updates to the standard will have far reaching consequences, so we welcome broad industry participation," Ana Paula, who will manage this JIP for DNV.

DNV will also be certifying the 394km long Cernambi-Cabiúnas pipeline, which will connect the Cernambi gas field to the Cabiúnas gas treatment plant on the coast of Rio de Janeiro and also includes the Lula Nordeste-Cabiúbas trunkline. This new trunkline will be installed by the Saipem's MV CastorOne, the world's largest pipelay vessel. It is important to note that the MV CastorOne and some of the FPSOs to be linked by the trunkline were classed by ABS, which shows how both DNV and ABS efforts complement each other in the busy Brazilian offshore scene.

65% of the world's offshore pipelines are designed and installed to DNV's pipeline standard and the trend is that more deepwater pipelines with long ties-ins will need to be installed in the near future along the Santos Basin in Brazil.







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Asia Pacific Spill Response

OSRL Increases Capabilities

Last month Oil Spill Response Limited (OSRL), a global oil spill response cooperative funded by more than 160 companies, opened its new base with enhanced response capabilities at Loyang in Singapore. Maritime Reporter took the opportunity to speak with Robert Limb, OSRL Chief Executive, regarding the significance of OSRL's expansion.

By Greg Trauthwein



The opening of the base last month in Singapore was touted as a milestone event for the maritime and oil and gas industries in the Asia Pacific region, as it brings together personnel and equipment resources in a single place, designed to deliver an integrated, swift and effective response to an emergency oil spill incident. A feather in the cap, so to speak, of the base centered on the arrival of the advanced subsea well capping equipment, the capping stack, which can be mobilized throughout the Asia Pacific region in the event of a subsea well control incident.

“Staying true to our mission to respond to oil spills effectively and efficiently anywhere in the world, the Loyang base forms an important link in our global network of response bases and is a strategic launch pad from which to deliver our response, preparedness and subsea well intervention services to our members and stakeholders in the region,” said OSRL Chief Executive Robert Limb.

Located within a dedicated oil and gas supply facility with wharf access and in proximity to key airports, the new base is strategically placed for OSRL to mount an emergency response either by air or sea, thereby offering a range of viable response delivery options during an emergency spill incident.

“OSRL is a global organization that provides members with resources to prepare for and respond to oil spills,” said

Limb. “OSRL’s history in Singapore goes back to the 1990s when it assisted in the establishment of EARL (East Asia Response Limited) in 1993. EARL was a Tier 3 organization focused on preparedness and response in the Asia Pacific region. EARL and OSRL merged in 2007 to form Oil Spill Response and East Asia Response Limited (OSRL/EARL). The company was renamed Oil Spill Response Limited (OSRL) in 2009. In recent years, OSRL has responded to major oil spills in Singapore, Malaysia, Korea, Pakistan, India and Australia from the Singapore Base.”

According to Limb, the Tiered Response concept of planning for oil spills focuses on how the global oil industry provides resources to respond to an incident.

“Under this concept, there are 3 tiers of response planning,” Limb said.

- **Tier 1** refers to having equipment on site to deal with minor operational spills.
- **Tier 2** means having access to in-country resources, both personnel and equipment, that are shared under a form of mutual aid agreement by the different companies working in the country and which provides for access to the resources in an emergency.
- **Tier 3** is designed to provide additional expertise and resources in the event of a major spill, either in terms of volume or complexity, which cannot be managed with available Tier 1 and Tier 2

OSRL is investing in spill response technology, facilities and people. **Left** is a new Capping Stack; **Below** the new base in Singapore.



resources.

"Members use OSRL to support their Tier 1 and Tier 2 resources in the event of an oil spill," Limb said. "OSRL has one of its Tier 3 bases located in Singapore due to the high volume of shipping traffic transiting the Straits of Malacca as well as its logistic infrastructure and proximity to other countries in the region."

OSRL, like other organizations in its genre, is constantly evolving and investing to ensure it stays up-to-date and relevant to the needs of its members.

"Since Macondo, industry has significantly strengthened its capability in offshore well design and operation, well intervention and oil spill response," Limb said. "From an OSRL perspective, we are seeing more precautionary mobilizations and extended times on location during an incident. There is greater depth in contingency planning as Members seek to ensure they have access to a wide range of resources both in-country and internationally."

"In this region, we have strengthened our response capability by increasing the number of dedicated oil spill responders stationed in Singapore to 30 and invested heavily in responder training and exercise especially in new skills sets such as shoreline assessment, incident command and modeling technology.

In May, we commissioned a subsea well cap that can be mobilized in the event of a well control incident. The cap can be deployed to water depths of up to 3,000m. We are also working closely with other response organizations, sharing experiences and knowledge as well as developing protocols to work collaboratively in the event of an incident in the region."

The New Singapore Base

In addition to its strategic location, its expanded size of 9,500 sq. m. comprises a storage area for response equipment and dispersant, a dedicated warehouse for subsea well intervention equipment, a state-of-the-art Emergency Operations Center, an in-house training facility and office space for 100 staff.

OSRL's integrated subsea well intervention system includes four capping stacks to shut in an "out of control" subsea well, plus two hardware kits to clear debris and apply subsea dispersant at the wellhead. It is suitable for the majority of known subsea wells in the Southeast Asia and Australasia region and can be deployed in water depths up to 3,000m.

Profile Robert Limb, OSRL

After graduating in Chemical Engineering from the University of Exeter, Robert joined Dresser Atlas in Houston as a Logging Engineer in 1980. On completing his initial training, he worked in the U.S., Middle East and the North Sea. On moving into management, Robert held various positions in operations, sales and senior management within the U.K. In 1990 he moved to Stavanger as Country Manager for Norway being responsible for Western Atlas' operations in Scandinavia and Northern Russia. In 1994 he moved to Singapore as Vice President Asia/Pacific responsible for all operations in that region. Following the acquisition of Western Atlas by Baker Hughes in 1988, Robert moved back to Houston as Vice President of Global Operations responsible for the Worldwide Operations, Manufacturing and Marketing for Baker Atlas. In 2003 he was promoted to Vice President of Sales for Baker Hughes being responsible for the Company's Sales and Marketing, Integrated Services and Corporate Communications.

In 2005, he left Baker Hughes and joined Vetco Aibel and following the sale of Vetco to GE in 2007, was promoted to President of Aibel Holding being responsible for the Company's international operations. In 2009 Robert left Aibel and joined Total Safety Inc. as Senior Vice President International Operations. After the successful sale of the Company to Warburg Pincus, he left Total Safety and was recently appointed CEO of OSRL.

In commenting on how the business of oil spill response has changed most dramatically in his career, Limb had this to say:

"Over the past 25 years the number of maritime incidents has fallen significantly with the introduction of double hulled oil tankers and improved navigation systems. The few maritime incidents that have occurred in recent years are primarily caused from bunker fuels. Since the Montara and Macondo



well incidents, we have seen a significant investment by the Oil and Gas industry in the prevention of oil spills and improvement in the scope and breadth of oil spill contingency plans. For OSRL this has meant a significant investment in people providing more specialist skills. The biggest change over the past several years is the need for more resources; the most significant is a tenfold increase in the number of personnel. What has not changed is the dedication and commitment of all the people who work for OSRL."

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Ohmsett, the Bureau of Safety and Environmental Enforcement's (BSEE) National Oil Spill Response Research and Renewable Energy Test Facility



Heinen & Hopman Complete HVAC Project

Heinen & Hopman in the Netherlands has completed the installation of a major HVAC system onboard the Dolwin Alpha offshore converter platform. Designed by IV-Oil and Gas, commissioned by Tennet/ABB and built by Heerema Fabrication group, the platform is now ready to be moved to the North Sea. This project involved the complete design and engineering of the HVAC systems, which Heinen & Hopman completed on time and to satisfaction. Heinen & Hopman received the initial order from the Heerema Fabrication group to become the HVAC subcontractor for the Dolwin Alpha project in July 2011. The Dutch company was responsible for the complete design and engineering of the heating, ventilation, air conditioning and chilled water systems, as well as the supply of all pumps, appendages, control equipment and piping on this giant offshore converter plat-



form. Built to convert energy generated by the offshore wind turbines installed in the German North Sea into high voltage direct current, the platform weighs some 9,300 tons. The platform has now been transported to the Mammoet yard in Schiedam. Heinen & Hopman is also responsible for the maintenance and failure handling of the platform for the first five years of operation.

Challenger Marine Condensing Unit

Engineered and manufactured by LeBlanc & Associates, Inc. from the ground up, Challenger marine condensing units are designed to withstand the harshest conditions at sea while keeping work environments comfortable. Challenger units are built to prevent unit corrosion from salt water spray and sea air unlike conventional units. The "Challenger Difference" includes complete 16 gauge 304 grade stainless steel construction, dipped coil coating to prevent fin and tube corrosion, watertight electrical enclosure, compact footprint for easy installation and service, raised horizontal base and units can be custom built for any application including replacement of older units.

www.leblancandassociates.com



Flexlife Completes Field Trial for Chevron



Flexlife, a provider of flexible pipe technologies and engineering services, used its new integrity monitoring technology at Chevron's Captain field in the U.K. North Sea. FlexGuard is an early detection system for possible riser integrity issues, designed to provide continuous real-time data on the condition of flexible risers. With more than 3,000 risers in use globally, with this number forecast to rise to 5,000 by 2015, and 35% forecast to suffer some form of outer sheath damage, the cost savings and environmental benefits are immense. Since its inception in 2007, Flexlife has developed a range of patented technology with the aim of reducing the risk of costly equipment failure. FlexGuard incorporates Flexlife's patented non-invasive, award winning ultrasonic (UT)

scanning technology in the form of a lightweight collar permanently fitted to flexible risers.

The new monitoring tool provides the operator with instant, continuous monitoring of any subsea riser, the company said. This information can be acquired remotely from any location in the world – ensuring a failsafe early warning system providing major cost and safety benefits.

The system can be installed either during installation or by retrofit to risers already in operation in the field.

CMA CGM Marco Polo Fitted with Marinestar

Fugro Seastar AS announced that CMA CGM Marco Polo has been fitted with Marinestar maneuvering system to assist in berthing and navigation. The satellite aided navigation technology is based on composite GPS and GLONASS constellations and measures precise speeds at the bow and the stern together with quay distances to assist the vessel safely to the berth.

The Marinestar system provides speed and heading information to a higher level of accuracy than conventional navigational aids such as doppler log and gyro compass. In addition to its navigation and berthing functions, Marinestar Maneuvering System is able to measure vessel trim fore and aft trim dynamically whilst underway at sea. In addition to the 16,000 TEU CMA CGM Marco Polo and the two sister vessels CMA CGM Jules Verne and CMA CGM Alexander Von Humboldt, the system is being installed on five other 13,800 TEU vessels in the CMA CGM fleet.

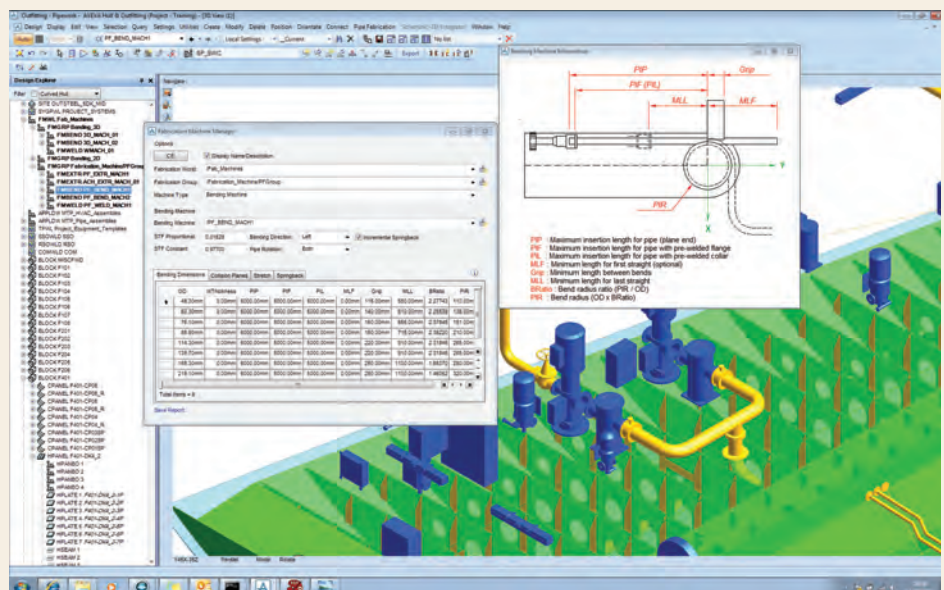
www.fugromarinestar.com

AVEVA Enhances Pipe, Steel Outfitting Fabrication

Pipe Fabrication, a new feature in AVEVA Marine.

AVEVA strengthened its AVEVA Marine software portfolio with efficiency enhancements to better manage production information. New and improved features have been added to AVEVA Outfitting to better control pipe and steel outfitting fabrication. These features are designed to enable shipbuilders and offshore engineers to benefit from tools to manage the entire production process from design to workshop, resulting in a more production efficient design and increased accuracy of production information. Within AVEVA Outfitting, Pipe Fabrication enables a piping designer to create cost-optimized, production-ready pipe designs at the outset. Steel Outfitting enables steel parts to be directly generated in the same way as hull parts, reducing design time and further improving the quality of production.

www.aveva.com/marine



New Alfa Laval T35 Heat Exchanger

Alfa Laval announced the addition of the new T35 gasketed plate heat exchanger to its broad portfolio of marine products and solutions. With patented features, the T35/TS35 introduces changes to today's marine coolers and cooling systems to deliver thermal efficiency, greater temperature flexibility, minimized fouling and reduced usage of raw material, the manufacturer said, adding, innovations to the frame, plate and gasket designs promise to raise heat transfer efficiency, lower investment and operating costs and reduce maintenance costs. Alfa Laval said the new T35 delivers the biggest transformation to gasketed plate heat exchangers since it introduced the concept of central cooling systems with these heat exchangers to the marine and offshore industries some 30 years ago. In addition to central cooling, the Alfa Laval T35 may also be used for lube oil cooling and for cooling in scrubber gas applications. Changes include:



- Improved plate design with patented Alfa Laval CurveFlow plate pattern, new porthole design and innovative distribution zone that ensures highly uniform distribution of the media across the entire surface. This significantly improves heat transfer efficiency.
- Patented Alfa Laval ClipGrip gasket system optimized for high and low pressures and for quick mounting and secure positioning. The new design extends gasket lifetime and significantly lowers maintenance and replacement costs compared to gasketed plate heat exchangers that require glued gaskets.
- Enhanced lightweight frame design with optimized frame thickness, two frame heights, updated marine class approval, and new roller assembly and special foot attachment to make opening and closing easier. These enhancements contribute to ease of maintenance.

www.alfalaval.com/solution-finder/products/t35

New Range of LED Lights from Britmar



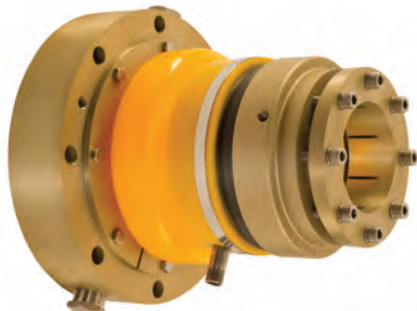
Britmar Marine in North Vancouver, Canada has developed a new range of LED light fixtures for the commercial marine industry. Its key component is an extremely efficient 130lm/W LED board, that does not require any additional thermal management, thus can operate even in tightly enclosed enclosures. There is a selection of few models of luminaries available featuring these boards, which can be connected directly to 12 or 24V DC, to universal AC input via driver or to any combination of these three in one. Three hour battery backup option is currently in development, as well as an option of using these boards as an easy-to-install retrofit kit for light fixtures currently in use on vessels.

www.britmar.com

New Mechanical Shaft Seal

Thordon Bearings introduced TG100, a new water lubricated mechanical face seal for 100 - 305 mm (4"-12") shaft diameters specifically designed for operation in abrasive waters, but able to operate in clean water too. The TG100 uses Silicon Carbide seal faces designed to last the life of the vessel and operate with ease in both clean and abrasive-laden waters. If the face seals should ever experience damage, a unique feature of the TG100 is its proprietary emergency seal that allows the shaft to continue to turn at low rpm for a limited time allowing the vessel to safely return to port. The elastomeric bellows on the TG100 is molded in a unique omega shape from a Thordon proprietary high temperature elastomer that has an unlimited shelf life, according to the manufacturer. The design of the bellows achieves the elastic spring force ensuring zero leakage.

www.thordonbearings.com



Maintenance-free Gyro Compass

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

Horizon MF is Raytheon-Anschütz' new strap-down compass system which uses Hemispherical Resonator Gyros (HRG) to measure angular rates for heading calculation. In a strapped-down system angular rate gyros and accelerometers are not gimbaled but mounted stationary in a housing.

The sensor measures angular rates and accelerations in three axes. Based on these measurements sophisticated software algorithms compute heading but also roll and pitch. Horizon MF comes as a maintenance-free (MF) sensor with

an outstanding lifetime performance. Its Mean Time Between Failure (MTBF) value is more than 100,000 hours which is a multiple of the MTBF values of optical but also classical mechanical gyros bringing forth an outstanding long lifetime and long-term stability gyro compass for seagoing vessels.

As part of a gyro compass system Horizon MF provides the same advanced functions like heading selection, heading monitoring, automatic switch-over functions, an independent transmitting magnetic compass and individual speed error correction which are well known for Anschütz gyro compasses.

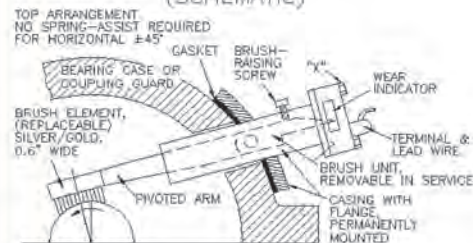
Of course, Horizon MF seamlessly integrates with the Anschütz Standard 22 gyro compass.



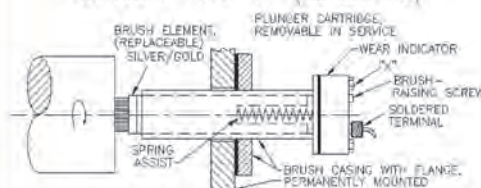
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A More Powerful Wärtsilä 34DF

Wärtsilä introduced a more powerful version of its 34DF engine. Today the Wärtsilä 34DF is being mainly used in tugs, ferries, RoRo, RoPax and workboats. The new and upgraded version of the Wärtsilä 34DF engine increases the efficiency in both liquid and gas operating modes and offers a power increase up to 500kw per cylinder. This increased output means that the Wärtsilä 34DF now covers a power range from 2.9 to 8 MW. In addition to the increase in power, fuel economy is also enhanced, especially when operating in liquid fuel mode. When operating in gas mode, the Wärtsilä 34DF engine is already compliant with IMO Tier III regulations without any secondary exhaust gas purification systems. Also when fueled by gas, the SOx and CO2 emissions are notably reduced, and smokeless operation is attained.

In liquid fuel oil mode, the Wärtsilä dual-fuel engines are fully compliant with the IMO Tier II exhaust emissions regulations set out in Annex VI of the MARPOL 73/78 convention.



GE to Equip Latest Hornbeck MPSVs



GE to equip two multipurpose supply vessels at Eastern Shipbuilding Group.

GE's Power Conversion business was awarded a contract by the Eastern Shipbuilding Group in Panama City, Fla., to supply integrated diesel-electric power, propulsion and vessel control systems for two multipurpose supply vessels (MPSVs) with installed horsepower of 12,070 BHP (9,000 kW). Eastern will build the MPSVs for Hornbeck Offshore Services of Covington, La. The new contract is for the first of two multipurpose support vessels for the company. The vessel control systems include Class 2 Dynamic Positioning (DP), power management, alarm and monitoring, vessel control and an integrated bridge system comprising navigation and communication equipment.

GE to equip two multipurpose supply vessels at Eastern Shipbuilding Group.



(L to R): Ralf Großhauser – Senior Vice President MAN Diesel & Turbo, Head of Turbocharger Business Unit, Stjepan Kucifer – Managing Director, MAN Diesel & Turbo Changzhou, and Dai Jun – Head of Turbocharger Production China.

First MAN TCR12 Turbocharger Built in China

MAN Turbocharger China unveils the first TCR12 turbocharger completely assembled at its Changzhou factory, confirming the company's strategy of localizing its turbocharger production in China. Initially acting as an assembly workshop for axial turbochargers, MAN subsequently localized component production over the years. In time, the Shanghai factory became too small and, in 2011, the turbocharger workshop was moved to the existing plant in Changzhou.

ABB Breakthrough for Enhanced Reliability Drillship

ABB won a landmark offshore marine industry contract covering electrical power and propulsion systems onboard a DP class 3 Drill Ship to be conferred with 'Enhanced Reliability' and DYNPOS AUTRO notation from DNV. The contract covers installations onboard a 'BT-UDS' dynamic positioned ultra-deep water drill ship ordered by Sigma Drilling, the joint venture between Norway's Skeie Technology and Houston-based Vantage Drilling, from STX Offshore & Shipbuilding. The vessel, to be built at South Korea's STX Jinhae yard, is scheduled for delivery in the second half of 2015.

The new DYNPOS ER class notation for Enhanced Reliability from DNV recognizes advances made

in flexibility, redundancy and fuel-efficiency in the structuring of DP systems. The notation covers connected power systems with standby start-up capabilities in specific conditions and the seamless and redundant change-over of generators and thrusters, via closed bus ties.

To meet DYNPOS ER and the DYNPOS AUTRO with closed ring requirements, the Sigma Drilling ship will feature ABB's most advanced protection devices; fast bus communications based on IEC 61850 standards and integrated blackout prevention functions. DYNPOS ER has specific requirements for operational flexibility and the safe operation of the power and thruster plant on board.

ABB is supplying a comprehensive package of power and propulsion plant and preventive maintenance systems onboard, including generator sets, switchboards, thruster motors, thruster drives, the drilling drive systems, Diesel Generator Monitoring System (DGMS) and Remote Diagnostic System (RDS).

The BT-UDS is a new design of drillship which has been developed by Bassoe Technology. Capable of drilling wells down to 40,000ft (12,190m) in water depths of up to 12,000ft (3650m), the 232m long, 38m wide vessel will have a payload capacity of 25,000 tons. Six azimuthing thrusters combined with the Bassoe-developed hull form will provide a transit speed up to 16 knots.



Design study developed by NLI Solutions, Rolls-Royce & Wilhelmsen Technical Solutions

Offshore oil and gas engineering specialist NLI Solutions (NLI) has developed a concept for a LNG Bunker Barge based on the NLI LNG tank design. The concept has been further developed in a design study together with the Marine division of Rolls-Royce and Wilhelmsen Technical Solutions (WTS).

LNG Bunker Barges are often described as the 'missing link' in the LNG supply chain. Today, only one example exists, capable of carrying 187 cu. m. of LNG, even though ocean-going ships need to bunker several thousand cbm. The HighTechBarge is designed to answer multiple demands for a cost-effective, high-tech high-volume barge.

For safe operations and increased maneuverability, the HTB will be equipped with podded propulsion similar to those used in offshore support vessels as well as state-of-the-art electronics for early threat detection. The NLI LNG tank is an atmospheric, prismatic steel tank, type 'B', with a capacity of 4,000 cu. m. of LNG. It will be fitted with a new insulation system with very low levels of boil off gas. Onboard power and propulsion are fed by an environmentally-friendly gas engine. The HTB has a large pressure tank on the aft deck for boil off gas handling and gas delivery to engine.

Planning for the study has been carried out between:

- NVC – Responsible for design, Bergen gas engine, pod drives and bridge systems;
- TI Marine Contracting (part of WTS) – responsible for insulation systems;
- NLI – responsible for tank, LNG/gas systems, bunkering systems;
- DNV – evaluation of the barge concept with respect to limitations and possibilities within the existing codes and regulations.

For further product and company information please visit:

www.lngtank.no

www.nli.no

www.wilhelmsen.com/technicalolutions



Recent DP Failures on MODUs

In two recent incidents, dynamically positioned drillships lost functional thrusters due to an electrical disturbance when attempting to reconnect a faulty thruster after maintenance. When the thruster was reconnected it was not electrically isolated from other thrusters and the thrusters did not "ride through" the disturbance causing loss of thrust. During these incidents the drillship crews were unable to restore all functional thrusters and as a consequence these drillships lost position and had to initiate the emergency disconnect sequence (EDS).

In another incident a dynamically positioned drillship encountered severe weather with high, shifting winds that caused it to lose position and initiate the EDS. Despite receiving a weather alert for severe thunderstorms and high winds well before this incident, only half of the available diesel generators were on line when the storm hit and the DP Operator (DPO) ordered a significant heading change with a high rate of turn when the drillship began to lose position. The drillship was unable to achieve the ordered heading or bring all generators online before it lost position and had to initiate the EDS. Based on these incidents, the U.S. Coast Guard recommends that owners and operators of dynamically positioned MODUs operating on the U.S. Outer Continental Shelf:

- **Include appropriate material on preventing these incidents in training programs for DPOs and other key DP personnel.** Training programs should maximize use of DP simulators to gain proficiency in maintaining heading (dynamically positioned drillships) and ensuring equipment is ready ahead of severe weather, ensuring communications with the drill floor (e.g. use of "blue advisory"/risk assessment) and re-establishing thrust in emergency situations. (See Marine Technology Society (MTS) MODU Operations Guidance Section 4.13 and IMCA M 117 Rev.1 Appendix 4).
- **Develop and implement a Critical Activity Mode of Operation (CAMO) and a Well Specific Operating Guideline** per MTS, "DP Operations Guidance" to ensure that the most reliable DP system configuration is used during critical activities. Develop and utilize a CAMO for any activity you or your lessee identifies as critical. When developing a CAMO, consider requiring open bus operation during critical activities to prevent a worst case failure with a potential for zero thrust in excess of your drift off time to the Point of Disconnect (See MTS DP MODU Operations Guidance Section 4.8 and Appendix C "Example of a CAMO", "Power Distribution").
- **It may be possible to make a common power system fully fault tolerant in respect of single failure criteria for DP Class 2 and DP Class 3.** However, in such designs fault tolerance depends on a very comprehensive range of protective functions and on many items of equipment being able to perform to capacity. Operating the power plant as two or more independent power systems reduces dependence on protective functions and vulnerability to hidden failures. It does not remove all common points between redundant systems. The potential to lose one part of the system is higher but the potential to lose the complete system is reduced (See MTS "DP Vessel Design Philosophy Guidelines" Section 10.8).
- **Perform testing aboard MODUs to ensure functional thruster drives will ride-through a system disturbance.** This testing should indicate how the system will react during a significant bus disturbance such as a short circuit on the main switchboard. Where ride-through capability is an essential part of the DP redundancy concept it should be proven by live short circuit and ground fault testing per Section 9.2.5 of the MTS "DP Vessel Design Philosophy Guidelines." This testing should be incorporated into the vessel DP Proving Trial (five-year).
- **Perform regular thermal imaging surveys of DP system electrical equipment** (e.g., switchgear, drives, motor controllers, etc.) as part of a preventative maintenance program to provide early detection of faulty or loose connections.

www.marineinvestigations.us



Perkins



McClure (right)



(L to R): USNS Comfort Third Officer Laura Hammond, Crowley Master Fred Walley, Chip Jaenichen, MSC Commander Rear Admiral T.K. Shannon



Rice



Carneiro

Baragona to Retire

CMA CGM America LLC, (Norfolk, Va.), said that Frank Baragona, Chairman of CMA CGM America LLC is retiring at the end of 2013 after a long shipping career including nine years as head of CMA CGM America. As of November 2013, Marc Bourdon, General Manager of CMA CGM do Brazil, will take on the position of General Manager of CMA CGM America LLC and will closely be working with: Todd Rives, Chief Commercial Officer; Ed McCarthy, Chief Operating Officer and Jim Arnold, Chief Financial Officer, already in place in Norfolk. Bourdon, who has been working in the transportation industry for 20 years and who has joined the CMA CGM Group 14 years ago, has an extensive experience in agency management.

Perkins Named VP at Ingalls

Huntington Ingalls Industries said that Don Perkins was named VP of contracts and pricing for the company's Ingalls Shipbuilding division. Operationally, Perkins' organization is responsible for contract administration, proposal formulation, estimating, pricing, negotiations, contract awards and change orders, as well as management of contractual risks and mitigation strategies.

Horizon Lines Names Hamlin COO

Horizon Lines, Inc. said that William A. Hamlin has been named Executive Vice President and Chief Operating Officer, and will continue to report to Sam Woodward, President and CEO. Hamlin joined Horizon Lines in March 2011 as Senior Vice President of Operations. Hamlin is a graduate of the University of Maine, and he began his career taking a position in Saudi Arabia.

McClure Elected a Fellow of SNAME

Alan C. McClure Associates (ACMA), a naval architecture and engineering firm, announced that ACMA President Scott McClure was presented with his Certificate as a Fellow by the council of SNAME (Society of Naval Architects and Marine Engineers) by SNAME President Peter Noble. Noble said that

McClure has been a respected member of this community for many years, following in the footsteps of his father, the late Alan C. McClure, who was elected a Fellow of SNAME in 1987. "This is a high honor, and well deserved," said Noble. "Less than 2% of the membership of SNAME attains this grade."

Crowley Shipmaster Honored

Capt. Fred Walley of the Ready Reserve Force (RRF) ship, was presented with the Spirit Award at the Nationals Park during a televised Major League Baseball game between the Washington Nationals and the Philadelphia Phillies on National Maritime Day, May 25. Walley was selected to receive the award on behalf of the company and his crew, which provided support to the relief organizations working in the areas hardest hit by Hurricane Sandy. Chip Jaenichen, deputy maritime administrator, MARAD; T.K. Shannon, commander rear admiral, Military Sealift Command; and Laura Hammond, third officer, U.S.N.S. Comfort, also received Spirit Awards alongside Walley during the event.

EBDG Team Grows in Seattle

Elliott Bay Design Group (EBDG) recently welcomed two new hires and two summer interns to the Seattle office. Zach McKinney and Jeremy Rice are the latest Marine Engineers to join the firm. EBDG is also pleased to welcome interns Tom Cusumano and Eileen Tausch to the team.

Carneiro to Head Tesla's Brazil Ops

Donizeti Carneiro has joined Tesla Offshore LLC as the company's area manager for South America, with an office in Rio de Janeiro, Brazil. For the past 13 years Donizeti has been involved with the Brazilian offshore oil and gas industry, ten of those years managing C&C Technologies' efforts in that area.

Dan-Bunkering Hires Thomsen, Dam

A/S Dan-Bunkering Ltd. said that Michel Dominique Thomsen has been employed as Senior Bunker Trader and

Team Leader with the company's office in Copenhagen, Denmark from May 1, 2013. It also announced that Søren Emil Dam, 29, has been employed as Bunker Trader with Dan-Bunkering in the company's head office in Middelfart, Denmark.

Dometic Appoints Chiang

Dometic Marine promoted Dennis Chiang to Asia Pacific Marine Divisional Manager.

IMUA Honors Three

Grace D. Thomas, Senior Vice President at Great American Insurance Company and a former Chairperson of the Inland Marine Underwriters Association (IMUA), was presented with a Lifetime Achievement Award at the association's Annual Meeting held mid-May. Thomas was one of three individuals recognized by the IMUA. The others included Arthur L. Flitner, CPCU, Senior Director of Knowledge Resources at The Institutes – Excellence in Education; and Julie A. Saunders, Inland Marine Business Unit Audit Lead, Travelers – 2012 Outstanding Committee Person.

USMMA Graduation: Class of 2013

The U.S. Merchant Marine Academy (USMMA) graduated 201 new maritime leaders as part of its Class of 2013 commencement ceremony. The keynote speaker, General William M. Fraser III, Commander, U.S. Transportation Command (USTRANSCOM), gave the commencement address before a crowd of more than 2,000 including special guest U.S. Transportation Secretary Ray LaHood, graduates, family members and representatives from the federal government, armed forces and maritime industry.

Based on Academy estimates, 49 of the Class of 2013 graduates will serve as officers in active military duty and 141 will serve as officers in the reserves while sailing on U.S. flag vessels; 82 on deep sea vessels, 37 on-off supply vessels and 19 on inland waterway and towing vessels; two on international flag vessels with the remaining graduates now making their final decisions.

Harvey Gulf Invests in LNG Bunkering Facilities

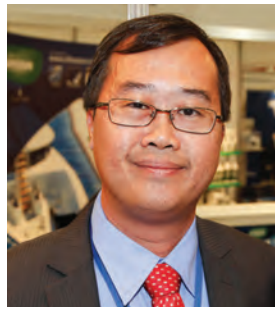
While the dearth of fueling stations has been lamented as the number one challenge to expanded use of LNG as fuel in the maritime sector, Harvey Gulf International Marine CEO Shane Guidry decided to meet the challenge head-on, announcing that Harvey Gulf secured plans to construct and operate the first LNG marine fueling facility in the United States, to be located at its vessel facility in Port Fourchon, La. To support the development of the LNG fueling facility, Harvey Gulf has secured CH-IV International of Houston, Texas as the EPC (Engineering, Procurement and Construction) contractor. The facility will consist of two sites each having 270,000 gallons of LNG storage capacity. The tanks will be stainless steel Type C pressure vessels with vacuum insulation and carbon steel exteriors. Each facility will be able to transfer 500 gallons of LNG per minute. Aside from the facilities primary role of supporting the Oil and Gas Industry, the facility will be capable of supporting over-the-road vehicles that operate on LNG. The estimate to complete the first site is February 2014, with the second site following shortly thereafter.

Aker Solutions, Statoil Cancel Cat B Contract

Aker Solutions ASA and Statoil ASA cancelled a contract for delivery of a semi-submersible rig capable of year-round well-intervention services on the Norwegian continental shelf. The companies in April 2012 agreed Aker Solutions would build the Category B (Cat B) rig and use it to provide Statoil with a range of well-intervention and drilling services for an initial eight years, starting in 2015. The technology development needed to build the rig has since proven to be considerably more demanding than initially anticipated and the parties agreed to terminate the contract. said Per Harald Kongelf, regional president for Norway at Aker Solutions. Each party will be accountable for its own project-related costs. Aker Solutions will in the second quarter book a one-off cost of NOK 375 million, of which



Thomsen



Chiang



Grace Thomas



USMMA Graduation Day

NOK 355 million shall be recognized as an impairment of the investments in the Cat B project, while the remaining are operating costs.

Herkules Acquires Umoe Schat-Harding and Noreq



Herkules signed an agreement to acquire Umoe Schat-Harding AS, an acquisition being carried out in cooperation with the owners of Noreq AS, who, in parallel, are selling Noreq to Herkules and reinvesting a substantial amount in a new, joint holding company. The transactions are expected to be finalized the first half of July. Herkules Private Equity Fund III will be the principal owner of the new company.

ClassNK Commences Provision of Archive Center Services

Classification society ClassNK reached a preliminary agreement with NYK Lines Co. Ltd. and Mitsui O.S.K. Lines Co. Ltd. regarding the use of the ClassNK Archive Center's As-built Drawings Storage Service (ADSS) for all kinds of ships. This agreement was made following consultation with NYK Lines Co. Ltd. and Mitsui O.S.K. Lines Co. Ltd., as well as Mitsubishi Heavy Industries Co. Ltd. and Imabari Shipbuilding Co. Ltd., the builders of the vessels that will utilize the service. A total of three vessels will use ADSS under this agreement, including the NYK Lines owned *Elegant Salute*, a 95,000 dwt bulk carrier, Sno. 1589, built at Imabari Shipbuilding's Marugame Corporate HQ; the Mitsui O.S.K. Lines operated *Jozen*, a 95,000 dwt bulk carrier, Sno. 1585, built at Imabari Shipbuilding's Maru-

gume Corporate Headquarters; and the Mitsui O.S.K. Lines owned *Horaison*, a 300,000 dwt VLCC, Sno. 2282, built at Mitsubishi Heavy Industries' Nagasaki shipyard. The ClassNK Archive Center utilizes IBM Japan's cloud computing technology. Although talks are still underway on requirements regarding the storage of Ship Construction Files (SCF) in line with the IMO's Goal-Based Standards (GBS), applicable to bulkers and tankers contracted from July 1, 2016, this onshore SCF Archive Center will be ready to store electronic information of ship drawings as soon as requirements are decided.

WSS Signs Service Fleet Agreement with Wilson Ship Management



Wilhelmsen Ships Service (WSS) finalized a five-year Safety Service Fleet Agreement with Wilson Ship Management (WSM), which has been testing WSS's new Safety Service Concept for 12 months. "In today's market, we are continually looking for ways in which we can keep costs under control," said Heine Olsen, Fleet Manager at Wilson Ship Management.

Delta Rigging & Tools Acquires Morgan City Rentals

Delta Rigging & Tools, Inc. acquired Morgan City Rentals, a provider of offshore rental equipment and rigging supply in the Gulf of Mexico. Established in 1970, Morgan City Rentals is headquartered in Morgan City, La., with additional locations in Golden Meadow and Broussard, Louisiana. It provides a wide range of offshore rental equipment, wire rope, rigging hardware and supplies,

slings fabrication, and compliance load testing to the offshore oil and gas industry. Combined with Delta Rigging & Tools' existing operations in Broussard and Houma, the acquisition of Morgan City Rentals establishes Delta Rigging & Tools as the leading offshore rental and rigging company in the Louisiana gulf coast market.

NASSCO Wins Deal to build Four Tankers



General Dynamics NASSCO entered into a contract with an affiliate of American Petroleum Tankers (APT) for the design and construction of four 50,000 dwt LNG-conversion-ready product carriers with a 330,000 barrel cargo capacity. The contract includes options to build four additional ships.

Construction of the first tanker is scheduled to begin in Q3 2014, with deliveries scheduled to begin in Q4 of 2015, continuing through 2016.

The 610-ft. tankers are a new "ECO" design that offers improved fuel efficiency and incorporates the latest environmental protection features, including a Ballast Water Treatment System. All of the ECO-class tankers will be built at the NASSCO shipyard in San Diego.

The ships will be designed by DSEC, a subsidiary of Daewoo Shipbuilding & Marine Engineering (DSME) of Busan, South Korea. DSEC's ECO design achieves improved fuel efficiency through several features, including a G-series MAN ME slow-speed main engine and an optimized hull form. The tankers will have dual-fuel-capable auxiliary engines and the ability to accommodate future installation of an LNG fuel-gas system.



Irene Waage Basili, CEO in GC Rieber Shipping graced the cover of MR sister-publication *MaritimeProfessional* in Q2 2013.

Irene Waage Basili Wins WISTA Award

Irene Waage Basili, CEO in GC Rieber Shipping, has been awarded the WISTA Leadership Award 2013 by WISTA Norway. Basili received the award as an acknowledgement of her strong efforts and diversified achievements within the Norwegian maritime industry. "Irene Waage Basili has demonstrated the WISTA values in practice. She is professional, open and dedicated," commented President of WISTA Norway, Bjørg Ekomrud.

"Irene has strong results to prove for. In GC Rieber Shipping the requirements for specialized competence is extremely high, hence contributes in positioning Norway in the global shipping arena with something unique, and in further developing a special competence that the Norwegian shipping industry can benefit strongly from."

"With former award winners like Elisabeth Grieg, Gunvor Ulstein and Borgny Eidesvik to mention some, I highly appreciate receiving this recognition from WISTA Norway," said Irene Waage Basili. She is engaged in the fact that it is so easy to problematize the aspect of women in a leadership role rather than focusing on the positive aspect of taking responsibility. In my generation, balance between job and family is just as demanding for men.

Basili leads a company that per today operates 15 advanced special carriers for use in the oil- and offshore sector.

Martek Debuts Compact BNWAS

Martek Marine launched a Lloyd's Register MED-approved BNWAS designed specifically for smaller bridges to meet the next stage of BNWAS implementation starting in July of this year. BNWAS regulations state that existing cargo vessels between 500-3000GT must be compliant by July 2013 and vessels between 150-500GT by July 2014.

Existing systems require a button to be pushed to confirm the crew's presence on the bridge. IMO legislation dictates that BNWAS systems' first stage alarm must sound between every three to 12 minutes. If the reset button is not pressed, the second stage will activate after 15 seconds. If the button is still not pushed, the third alarm will sound between every 90 - 180 seconds.

Although effective in theory, there have been several incidents, including the grounding of MV Karin Schepers in 2009, on vessels which have had BNWAS installed but switched off, as crew have simply found it too demanding to continue with other necessary work while being disturbed by such frequent alarms and the requirement to push a button so regularly.

Martek has addressed this issue in several ways. First, with the inclusion of a passive infrared (PIR) motion sensor. This is built in to the device's panel and detects movement on the bridge. No alarm sounds as long as movement is detected on the bridge, and crew can work undisturbed. Only when the system detects no movement for a set time, between the IMO's mandated three and 12 minutes, will the alarms sound. Because the PIR sensor is part of the panel, no extra installation is required and no additional wiring is needed, reducing the cost, installation time and space needed.

ABS Releases Ship Energy Efficiency Measures Advisory

ABS released the ABS Ship Energy Efficiency Measures Advisory to provide guidance on the wide range of options available to improve vessel efficiency, reduce fuel consumption and lower emissions. The Advisory is designed to assist owners, operators and other stakeholders in conducting the techno-economic analysis needed to meet the challenges of rising fuel costs and increasing environmental regulatory requirements. The Ship Energy Efficiency Measures Advisory gives decision-makers tools to make informed choices about the options available for improving vessel efficiency, reducing fuel consumption and lowering emissions and guidelines for applying the technologies to their assets.

Astrium Opens New Brazil Office

Astrium Services opened a new office in Rio de Janeiro that will focus on sales and support for service providers in the region. It will also be an important link for Norwegian customers of Marlink – Astrium Services' direct sales channel – many of whom have significant operations in Brazil. The new office is run by newly appointed Sales Director and Country Manager for Brazil, Fabio Riccetto. With over 20 years' experience in telecom sales and marketing, Riccetto provides the much needed local connection in Brazil.

Stolt Upgrades VSAT



Stolt Tankers has chosen Marlink to upgrade its entire fleet of deep sea and regional tankers to the Sealink Global Ku-band VSAT service. The contract, signed in April 2013, covers the provision of Sealink to 90 tankers, resulting in significant bandwidth enhancements across the fleet, meeting Stolt's changing connectivity requirements for operational and crew communication.

ABS Enters Indian Wind Market

ABS Consulting completed its first noise emission test in India for SRC Green Power's wind turbine in Tirunelveli, India, just southwest of the state capital, Chennai. The noise assessment of the 250 kW wind turbine generator (WTG) was conducted by the company's IEC 61400-11 accredited subcontractor, WIND-Consult. The test took three days to complete and provided feedback on Noise Emission decibel levels at wind speeds ranging from 6 m/sec to 10 m/sec. This testing qualifies SRC Green Power's 250 kW WTG in European markets and will also help SRC Green Power achieve Type Certification of the WTG.

Wilhelmsen Upgrades Unitor-Generon N2 System

Wilhelmsen Technical Solutions launched an upgraded Unitor-Generon inert gas system to fulfill increased demand from shipping and offshore customers for a high-efficiency, low energy purging and padding system for liquid cargo safety.

The updated Unitor-Generon system features modern membrane technology

developed by Generon which enables the complete system to produce required levels of nitrogen using smaller compressors and other components, reducing overall footprint and lowering onboard energy consumption.

Liebherr Opens in Miami

The new Liebherr sales and service center celebrated its grand opening on June 11, 2013 in Miami, Florida. The new state-of-the-art facility is located in Hialeah Gardens just off Okeechobee and the Florida Turnpike. It will serve as a major hub for Liebherr maritime cranes and will further strengthen business relations to Latin America and the Caribbean. The investment sum for this new Liebherr subsidiary, situated on a total property area covering about 431,000 sq. ft., is approximately \$20m.

AMOS for PrimeServ Academy

MAN Diesel & Turbo selected SpecTec's AMOS software as assisting training tool to be used at the MAN PrimeServ Academy in Copenhagen. The AMOS database for this project has been created automatically by importing MAN Diesel & Turbo engine data which is standardized in accordance with the Shipdex protocol.

Transas: VTS Contracts in Indonesia

Transas Marine Pacific and its local representative in Indonesia have been awarded new contracts from the Government Department of Sea Transportation to supply and install Vessel Traffic Management Systems for Samarinda and Banjarmasin ports. In addition, Transas will upgrade the current VTS system in the Semarang port with a fully redundant AIS Base Station T214.

Atlas Enterprises Moves a Superyacht

Atlas Enterprises recently moved the heaviest object employees have transported since it was founded as Ron Holland Housemoving in the early 70s. The superyacht, a 215-ft. and 480-ton structure, is equipped with a swimming pool on deck that doubles as a helicopter pad when the pool cover closes over the top. "It's not the largest thing I have ever driven," said Chris Holland, president of Atlas Enterprises, "but it is certainly the most expensive."



The three winners of the GL Young Professional Award. From left to right: Lampros Nikolopoulos, Eva Binkowski and Hannes Lindner.

GL Young Professionals Award: Efficiency Innovators

At a ceremony held at the Nor-Shiping maritime exhibition in Oslo, classification society Germanischer Lloyd (GL) rewarded three young engineers for their outstanding scientific research with the GL Young Professionals Award.

Dr. Pierre C Sames, GL Senior Vice President and Head of Research and Rule Development presented the prizes, which range in value from €1,000-3,000 to winners from Greece and Germany.

- Lampros Nikolopoulos of the National Technical University of Athens received the top honor and a first prize of €3,000 for his paper: "Holistic Methodology for the Optimization of Tanker Design and Operation and its Applications."
- Second prize and with it an award of €2,000 was given to Eva Binkowski from the University of Rostock for her paper: "Optimization of a parametrically modeled containership for power taking into account predicted operational profiles."
- Hannes Lindner of the University of Rostock was awarded third prize and €1,000 for his paper "Verification and Validation of numeric towing test with a ship model free to trim and submerge."



BUYER'S DIRECTORY

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

ALUMINUM BOATS

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

AUTOMATIC IDENTIFICATION SYSTEM

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

AUTOPILOT SYSTEMS

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

BOAT BUILDING AND DESIGN

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

CAMERAS

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

CAPSTANS

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

COATINGS/ CORROSION CONTROL/ PAINT

Hempel A/S, Lundtoftevej 150 DK-2800 Kgs, Lyngby , tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com
Jotun Paints, 9203 Highway 23, Belle Chasse, LA , USA , tel:(800) 229-3538, milton.campo@jotun.com contact: Milton Campo, www.jotun.com

CONTROL SYSTEM-

MONITORING/STEERING

Prime Mover Controls, 3600 Gilmore Way, Burnaby BC

CORDAGE

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

CORROSION CONTROL

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

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

COUPLINGS

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

CRANE - HOIST - DERRICK - WHIRLEYS

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

DECK MACHINERY- CARGO HANDLING EQUIPMENT

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

NABRICO, 1250 Gateway Drive, Gallatin, TN 70002-4989, USA , tel:(615) 442-1300, brian.corbin@trin.net contact: Brian Corbin, www.nabrico-marine.com
Superior-Lidgerwood-Mundy, Corp., 302 Grand Ave., Superior, WI 80W 2L0, USA , tel:(715) 394-2383, stenerelli@lidgerwood.com contact: Sean Tenerelli, www.lidgerwood.com

DIESEL ENGINE- SPARE PARTS & REPAIR

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

DRILLS

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

DRIVESHAFTS

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

ELECTRIC & CONTROL SYSTEMS

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

ENGINES

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

FANS

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

FILTERS/FILTER SYSTEMS

Yankee Wire Cloth Products, 221 W. Main Street, West Lafayette, OH , tel:866-265-0502, fax:(740) 545-6016, yk@yankeewire.com contact: Bill Timmons, www.yankeewire.com

GALLEY EQUIPMENT

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

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

HVAC

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

INTERIORS

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

LAUNDRY EQUIPMENT

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

LIFESAIVING EQUIPMENT

CM HAMMAR AB, CM Hammar AB August Barks Gata 15 421 32 Västra, Frölanda, Sweden , tel:+46 31 70965

50, fax:+46 31 497023, info@cmhammar.com , www.cmhammar.com

LIFT EQUIPMENT

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

MARINE CONSTRUCTION/REPAIR

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

MARITIME TRAINING & SCHOOLS

Freelance Software, 39 Peckham Place, Bristol, RI 04223, USA , tel:(401) 556-1955, fax:(401) 396-9717, chris@hawsepipe.com contact: Christopher Dady, www.hawsepipe.net

MEASUREMENT & CONTROL PRODUCTS

Omega Engineering, 1 Omega Drive, Stamford, CT

METEOROLOGICAL INSTRUMENTS

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

NAV/COMM EQUIPMENT

Marlink, Offices in: Oslo, London, Hamburg, Brussels, Athens, Dubai, Mumbai, Singapore, Tokyo, Washington DC and Houston , tel:+32 70 233 220, fax:+32 2 332 3327, customer.service@marlink.com

PAINTS AND ANTI FOULANTS

HOLDTIGHT SOLUTIONS INC., PO BOX 27907 HOUSTON, TX 77227-7907 , tel:713-266-9339, sales@holdtight.com

PARTS LOCATOR SERVICE

Inventory Locator Service, 8001 Centerview Pkwy Ste 400, Cordova, TN , tel:901 794-5000 contact: Pamela Pugh, www.ILSMART.com

PIPE

FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

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

PROPULSION EQUIPMENT

VOLVO PENTA OF THE AMERICAS INC, 1300 Volvo Penta Drive, Chesapeake, VA , tel:+1 757 3824010, lindsay.shrewsbury@volvo.com contact: Customer Relations Support, www.volvopenta.com

RIGID INFLATABLE BOATS

Pennel & Filipo USA, P.O. Box 1695, Mount Pleasant, SC , USA , tel:843-881-9026, fax:843-881-9026, lcourcoux@pennelusa.com

RUST AND PAINT REMOVAL

Rustibus, 2901 West Sam Houston Pkwy, North Suite E-325, Houston, TX 36652, USA , tel:(832) 203-7170, fax:(832) 203-7171, houston@rustibus.com , www.rustibus.com

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Scienco/FAST - a division of Bio-Microbics, 12977 Maurer Industrial Drive, Sunset Hills, MO 03055, USA , tel:866-652-4539, fax:314-756-9306, solutions@sciencofast.com

SHIPBUILDING-REPAIRS, MAINTENANCE, DRYDOCKING

Signal International, 1011 S.Hwy 6 Suite 108, Houston, TX , tel:281 899-2122 contact: Rob Busby, www.signalshiprepairllc.com

SIMULATION TRAINING

Kongsberg Maritime Simulation Inc., PO Box 180 70 Essex Street, West Mystic, CT , tel:709 582-1112

SURFACE PREP MATERIALS

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TURBOCHARGERS

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

VACUUM TOILET SYSTEM

Jets Vacuum AS, Myravegen 1 6060 Hareid , tel:47 700 39 100, fax:47 700 39 101, post@jets.no

WASTE WATER TREATMENT

Scienco/Fast - a division of Bio-Microbics, 12977 Maurer Industrial Drive, Sunset Hills, MO , tel:(866) 652-4539, fax:(314) 756-9306, solutions@sciencofast.com

WINCH MANUFACTURER

Patterson Company, 870 Riversea Road, Pittsburgh, PA 33310-5247, USA , tel:(412) 322-2012, russ.mayhew@pattersonmfg.com contact: Russ Mayhew, www.pattersonmfg.com

WINCHES & FAIRLEADS

Patterson Company, 870 Riversea Road, Pittsburgh, PA , USA , tel:(412) 322-2012, fax:(412) 322-2785, russ.mayhew@pattersonmfg.com contact: Russ Mayhew, www.pattersonmfg.com
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ZF MARINE, an international leader in sales and service for the marine propulsion industry, is seeking qualified candidates to join our dynamic team.

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Individual will manage our service center location in Linwood, PA, to meet the operational targets, maintain strong customer relations, and represent ZF Marine in the local marine community. BS degree preferred, with 5 years business/service management experience needed, including product knowledge and marine industry experience.

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Provide excellent customer service in installation, repair, overhaul, inspection, trouble-shooting and testing of ZF Marine products (transmissions, accessories, drive systems, control systems) in-house and on-site. Trade school degree preferred with 2 - 3 years of marine industry experience. Product knowledge, including knowledge of vessel systems, basic electrical/electronics, and mechanical aptitude needed. 40-50% domestic and international travel required. Passport / TWIC / Port Security eligibility required. Must possess a valid driver's license.

ZF provides a competitive salary and an excellent benefits package.

For consideration, please e-mail your resume and letter of interest to:

ZF Marine
Attn: Ruth Lane,
HR Manager
ruth.lane@zf.com



EOE/AA M/F/D/V

Bouchard Transportation Co., Inc.

2nd Tug Mate

Qualifications:

- Minimum of a 200 ton Mate Near Coastal with Radar Observer, TOAR, STCW and VSO endorsements
- TWIC
- GMDSS operator/maintainer a plus

Asst Engineer

Qualifications:

- Degree from Merchant Marine Academy or 3 year's experience working on tugs of at least 2,000 HP
- MMD DDE 1,000 to 4,000 HP
- STCW
- TWIC

Tankerman AB/Cargo Mate

Qualifications:

- Minimum of a AB Tankerman PIC (BARGE)
- STCW
- TWIC

Send all resumes to
personnel@bouchardtransport.com
Or Fax to 631-390-4966

USCG Licensed Assistant Engineer Job Location: USA

Summary: This crewmember is responsible for operating, maintaining, and repairing the equipment under his care during his watch in compliance with all governmental and company regulations including pollution prevention procedures.

Essential Duties and Responsibilities

Primary:

- Monitor propulsion, electric generation and dredging equipment.
- Provide instruction to Oiler during watch.
- Ensure that the Oiler performs his duties efficiently and makes rounds correctly.
- Make a round of the engine spaces before accepting watch.
- Conduct frequent inspections of the machinery and engine spaces during watch.
- Perform routine maintenance, repair work, and make improvements to the plant.
- Maintain clean and orderly engine spaces.
- Ensure that all loose items are properly stowed.
- Maintain official log books.
- Maintain oil transfer record book.
- Update maintenance records.
- Review the Oiler's log.
- Complete the daily report to the Captain and Chief Engineer.
- Ensure that all equipment is operating in a safe manner, and that required safety gear is worn by departmental personnel.
- Report and / or correct any unusual machinery operation or

vibration.

Secondary:

Other duties, as assigned.

Qualifications

12 hours per day / 3 weeks on, 3 weeks off
Travel required

Education and/or Experience: Dredging experience preferred
Certificates, Licenses, Registrations: Minimum of 3rd Assistant Engineer of Motor Vessels, Unlimited; STCW '95 Certificate; TWIC

Physical Demands: Ability to lift up to 50 lbs, endure normal weather conditions and rough seas, stand for long periods of time, some climbing, tolerate vibrations and high noise levels.

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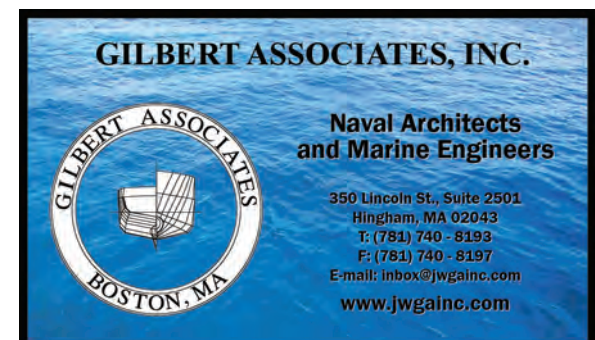
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