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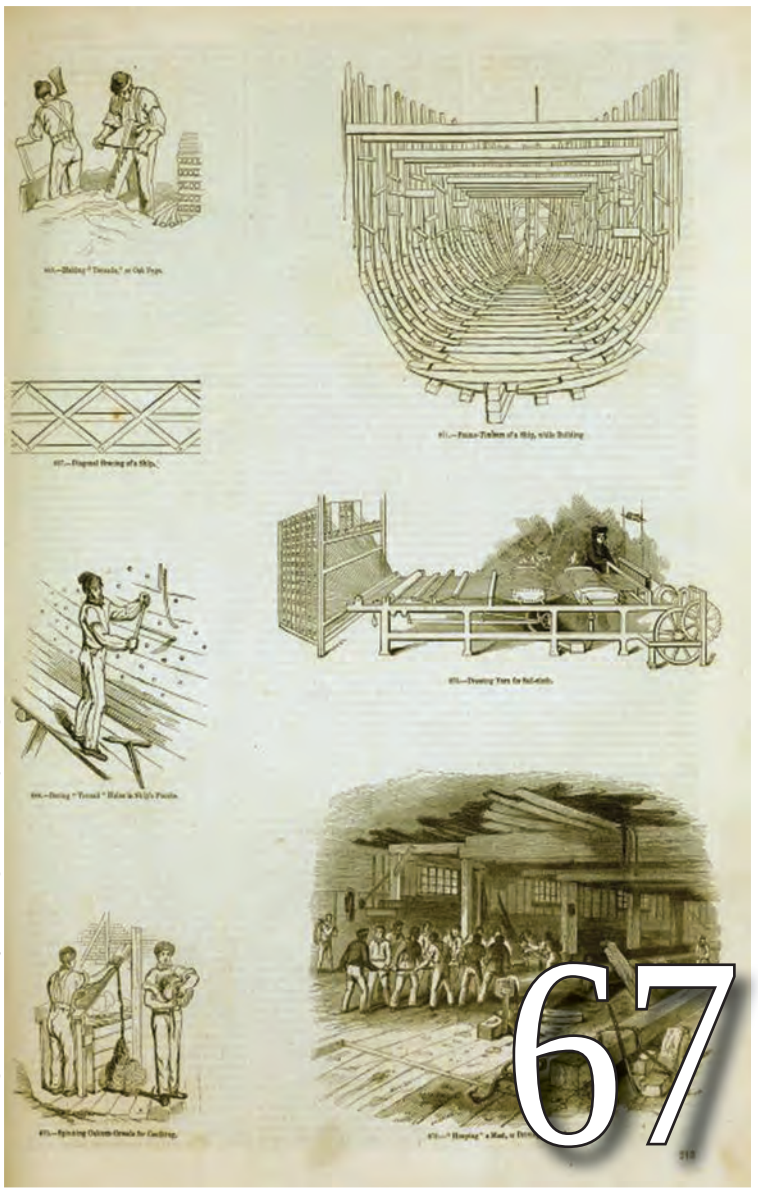
Cover Image: Courtesy ZF Marine



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He tells MR how and why.

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MARINELINK.COM

HQ
118 E. 25th St., 2nd Floor
New York, NY 10010 USA
Tel +1 212 477 6700
Fax +1 212 254 6271
www.marinelink.com

FL Office
215 NW 3rd St
Boynton Beach, FL 33435-4009
Tel +1 561 732 4368
Fax +1 561 732 6984

Publishers
John E. O'Malley
John C. O'Malley
jomalley@marinelink.com

Associate Publisher/Editorial Director
Greg Trauthwein *trauthwein@marinelink.com*

Vice President, Sales
Rob Howard *howard@marinelink.com*

Web Editor
Eric Haun *haun@marinelink.com*

Web Contributor
Michelle Howard *howard@marinelink.com*

Editorial
George Backwell - *Thailand;*
Joseph Fonseca - *India*
Claudio Paschoa - *Brazil*
Peter Pospiech - *Germany*
James R. McCaul - *Washington, DC*

Production
Irina Tabakina *tabakina@marinelink.com*
Nicole Ventimiglia *nicole@marinelink.com*

Corporate Staff
Mark O'Malley, Public Relations
Esther Rothenberger, Accounting
Gabby DelGatto, Office Manager

Information Technology
Vladimir Bibik
Emin Tule
Christopher Lee

Subscription
Kathleen Hickey *khickey@marinelink.com*

Sales
Lucia Annunziata *annunziata@marinelink.com* *+1 212 477 6700*
Terry Breese *breese@marinelink.com* *+1 561 732 1185*
Frank Covella *covella@marinelink.com* *+1 561 732 1659*
Mitch Engel *engel@marinelink.com* *+1 561 732 0312*
Mike Kozlowski *kozlowski@marinelink.com* *+1 561 733 2477*
Dawn Trauthwein *dtrauthwein@marinelink.com* *+1 631 472 2715*
Jean Vertucci *vertucci@marinelink.com* *+1 212 477 6700*

International Sales

Scandinavia
Roland Persson roland@orn.nu
Orn Marketing AB, Box 184 , S-271 24
Ystad, Sweden
t: +46 411-184 00 f: +46 411 105 31

Western Europe
Uwe Riemeyer riemeyer@intermediapartners.de
t: +49 202 27169 0 f: +49 202 27169 20

United Kingdom
Paul Barrett ieaco@aol.com
Hallmark House, 25 Downham Road, Ramsden
Health, Essex CM11 1PU UK
t: +44 1268 711560 m: +44 7778 357722
f: +44 1268 711567

Japan
Katsuhiro Ishii amskatsu@dream.com
Ace Media Service Inc., 12-6, 4-chome, Nishiike,
Adachi-ku, Tokyo 121, Japan
t: +81 3 5691 3335 f: +81 3 5691 3336

Korea
Jo, Young Sang biscom@biscom.co.kr
Business Communications Inc., Rm 1232,
Gwanghwamoon Officia Bldg., 163,
1-Ga, Shinmoon-Ro, Jongro-Gu,
Seoul, Korea 110-999
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software ... is it 'evolution' or **'revolution'** ...

GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

The August "Shipbuilding Annual" is one of my favorites to research and produce every year, but even more so when this edition coincides with the SMM exhibition in Hamburg, Germany, which is the largest, best shipbuilding fair in the world.

Early next month more than 50,000 visitors from around the world will walk through the halls of the Hamburg Messe und Congress, for meetings, conferences and social occasions for sure, but first and foremost for a glimpse of the new and emerging technologies for the maritime industry.

This edition is literally packed with articles that best exemplify the innovative spirit that transcends the maritime community today, but the highlight once again is Patricia Keefe's feature focus on Software Solutions in the ship construction sector; or more accurately the evolution of software solutions in making the ship design and manufacturing process better.

When we set Patricia on this course a couple of months ago, true to form she dug into researching the topic with abandon. While it was originally envisioned that this would be a 'one-and-done' feature, it actually is the first of a trilogy, culminating in the October 2014 'Marine Design Annual' edition.

When it comes to software solutions, you can call it an evolution, you can call it a revolution, but advances in computing and software technology are arguably the number one technological innovation that has made the business of designing and building ships more efficient, cost-effective and profitable. Her story, which is a continuation of our '75th Anniversary Celebration,' starts on page 67.

Starting at Posidonia 2014 in June and over the early course of the summer we were able to catch up with several industry leaders in varying sectors for their insights on not only their companies, but the industry at large. As the U.S. shipbuilding sector continues to gain steam, powered by transport needs in the vibrant energy sector, I had the opportunity to visit with Vigor Industrial owner **Frank Foti** in his shipyard in Seattle last month. In my 20+ years at the helm of *Maritime Reporter*, I have been privileged to meet and interview hundreds of CEOs and executives from across the maritime world, and it is no stretch to say that Foti was as entertaining and informative as any of them. The story of Vigor Industrial's consolidation of the Pacific Northwest maritime industry starts on page 94.

Looking a bit further afield, **Abu Bakar Mohd Nor**, CEO of N-KOM in Qatar, shared with me his vision of this new Middle East shipbuilding powerhouse, which relies on strong resources from parents Keppel and Nakilat. The story on N-KOM starts on page 80.

Last but certainly not least, the central figure in our "Heavy Lift" section is insights from Dyneema CEO **Gerard de Reuver** (page 98). de Reuver delivers a literal primer on everything you wanted to know about Ultra High Molecular Weight Poly-Ethylene fiber and its increased use in ultra heavy lift operations, including the recent salvage of Costa Concordia.

trauthwein@marinelink.com

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Wishful Thinking From Across the Pond

European Shipowners Pursue Softening of the Jones Act

Joseph Keefe is the lead commentator of MaritimeProfessional.com, and is Editor of both *Maritime Professional* and *MarineNews* print magazines. He can be reached at Keefe@marinelink.com

Just last month, the Secretary General of the European Community Shipowners' Association (ECSA) opined that the sixth negotiations round of the Trans-Atlantic Trade and Investment Partnership (TTIP) should include concessions from the American side on maritime transportation issues. Specifically, he called for European access to the "feedering" of international cargo in U.S. domestic trades and access to the American dredging and offshore sectors. **They didn't ask for anyone's first born child, but I suppose that there's still time to issue that edict before the end of the summer.**

EU and US negotiators met in mid-July for the sixth Trans-Atlantic Trade and Investment Partnership (TTIP) negotiations. The agenda included the effort to remove trade barriers in a wide range of economic sectors, as well as a look at opening markets for services, investment, and public procurement. For its part, ECSA hoped for "an ambitious agreement in which maritime transport and its specificities will be duly taken into account." Fair enough.

ECSA further laments that restrictions on domestic cargoes, so-called cabotage rules, still firmly exist in the United States. This results from the Merchant Marine Act of 1920, better known as the 'Jones Act.' Commenting on the Jones Act, Patrick Verhoeven, ECSA Secretary-General, said in a prepared statement, "Whilst it is true that restrictions on pure domestic cargoes may not constitute a prime barrier to international maritime trade, the Jones Act does have implications for the delivery of international cargo. Today's reality is that very often international cargo must be transshipped from one vessel to another, often smaller, vessel, in order to reach its end destination. Under the Jones Act, this 'feedering' of international cargo is currently restricted."

He's right. Not about the effort to weaken the Jones Act, but certainly, foreign registered tonnage is excluded from shortsea shipping here in the United States. Make no mistake about it: the timing of the ECSA remarks are anything but a coincidence, even as the Panama Canal expansion inches its way towards completion. That's because the mega-containerships that promise to bring large cargoes with deeper draft tonnage will only be able to call at certain U.S. ports. Those cargoes presumably will need to be transshipped elsewhere, either via smaller feeder ships or over the road. From the standpoint of the maritime industry and looking at our domestic intermodal situation, the former route would make a lot more sense. But, given the dismal shape of our 'shortsea shipping' formula, it's doubtful that this will happen any time soon.

ECSA wants to have full access "for international carriers to engage in such operations as they do not constitute purely domestic operations." But, once those cargoes land here in the United States, that's exactly what they become – purely domestic operations. More than likely, where this is really stems from is the ongoing overcapacity in the global container shipping fleets which have beaten rates down and put several operators on the ropes. An infusion of shortsea container routes on this side of the pond would put a nice dent in that problem. Is that the problem of the United States? I don't think so.

In truth, the ECSA will probably get what it wants in any event. That's because the most likely spot for domestic container transshipments probably won't be from Charleston, SC or Norfolk, VA. Instead, it'll come from Freeport, Bahamas where a largely underutilized but deep draft and high capacity terminal is all ready to go, complete with high tech and efficient container screening devices in place. It's close by, satisfies even the most stringent container screening requirements, accomplishes the same task and allows smaller vessels to take those containers to niche ports like Boston, Massachusetts. And, since it will emanate from the Bahamas, the use of foreign flag tonnage is A-Okay. Beyond this, and short of an abolishment of the HMT fees imposed on shortsea cargoes here in the U.S., it is unlikely that a domestic shortsea container feeder service could work for anyone – foreign flag or domestic. Reading further, ECSA naturally also wants more frequent individual and industry waivers to the Jones Act as well as more flexible and clearer procedures to obtain them. But, ECSA has already got a U.S. Administration that's handed out more of these in the past six years than were granted in the previous 60 years combined. Mission accomplished – they can tick off that box on their bucket list.

Finally, EU shipowners also crave greater market access for dredging and offshore services; two sectors that are doing pretty well right now because (a) the Panama Canal renovations are pushing U.S. ports for greater transit drafts and (b) the energy boom in the U.S. Gulf shows little sign of abating just yet. Nevertheless, and unlike the occasional domestic oil cargo that goes to a foreign carrier for lack of a suitable U.S. flag tanker, the U.S. offshore sector is as robust and well-tooled as it has ever been, with new tonnage hitting the water almost daily. We contacted both the ECSA and the U.S. Trade Representative for comment on the ECSA 'wish list.' An E-mail to the U.S. Trade Representative went unanswered, ECSA responded with a prepared statement. Also not at the table, but watching the proceedings closely from the sidelines is the Federal Maritime Commission (FMC). Nevertheless, FMC Commissioner William P. Doyle, responding to our inquiries, said, "The U.S. commercial shipbuilding industry is on solid footing, thanks in part to the domestic production of oil, shale gas and condensates. Private sector investment is strong in the Jones Act. Ships are on order and being constructed to carry liquids, operate on LNG as a marine fuel and carry containers. The Jones Act is critical to our economic and national defense – providing jobs and sustaining mariners at a moment's notice in times peace, war, and/or national emergency. I support the Jones Act." That sounds clear enough. It also makes you wish Doyle was at the table doing the negotiating on our behalf.

As far as I know, the Jones Act is still in place, TTIP negotiations or not. Every once in a while, this kind of noise roils the waters and eventually goes away. No doubt, this will be one of those instances. But, Jones Act advocates need to be watching closely. Allowing limited access to registered tonnage in certain routes – like shortsea containers or dredging, for example – is like being a little bit pregnant. Either you are, or you are not. In the middle of the biggest shipping and maritime revival on these shores in the past 50 years, this is simply no time to find out.

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VesselValue.com launched a series highlighting the world's most expensive active vessels, and this week focuses on the costliest of all: QMAX liquefied natural gas (LNG) carrier Zarga, which prices in at a whopping $221.8 million. According to VesselValue, Zarga's sticker price is equal to 1.5 of Real Madrid footballer Gareth Bale's $145 million transfer fee, 13 12-carat Pink Diamonds at a value of $17 million each, or 49 Lamborghini Veneno Roadsters which cost $4.5 million apiece.

We did our own math to calculate the quantity of other items that could be purchased for the price of The Zarga.

- Olympic size swimming pool ($1 million): 221
- 64GB iPhone 5s ($399): 555,889
- German Shepherd puppy ($1,100): 201,636
- Lego Maersk Line Triple-E toy ship ($149): 1,488,590
- Name a star on the International Star Registry ($54): 4,107,407

The Zarga, built in 2010 by Samsung and owned by Qatar Gas Transport Company, has a capacity of 266,433 CBM and is over 340 meters long, making it one of the largest LNG carriers in the world.

For $221.8 million Joe Keefe (right), editor of sister publications *MarineNews* and *MaritimeProfessional*, would be able to fill his office with 1,488,407 Lego Maersk Line Triple E model ships.

Courtesy of VesselValue.com

Courtesy Joe Keefe

UPDATES

Meyer Werft Takes Over STX Finland

German cruise shipbuilder Meyer Werft joined forces with the STX Finland shipyard in Turku when the Finnish Government and Meyer Werft signed a share purchase agreement with the current owner STX Europe. With its 70% stake Meyer Werft takes the industrial leadership of the new company.

Today 1,300 employees and a specialized supplier network are involved in the construction of the cruise ship Mein Schiff 4 for the German cruise operator TUI Cruises from Hamburg. TUI Cruises recently announced an order for two additional ships of this class in Turku. "This acquisition will strengthen the yards in Papenburg, Turku and Rostock," said Dr. Jan Meyer, managing partner of Meyer Werft. "(By) joining forces with Turku we can offer more flexibility to our customers. The acquisition is still subject to clearance by the antitrust authorities and banks. The plan is to rename the company STX Finland Oy to Meyer Turku Shipyard Oy.

Gondan to Build Spanish Patrol Boats

Gondan Shipyard signed a contract with the Guardia Civil, Spain's Civil Guard, for the building of two patrol boats.

The aluminum and fiber (PRFV) vessels will measure 20.5 x 5m and will be built at Gondan Shipyard's facilities in Vegadeo. Delivery is scheduled for Summer 2015.

Image: Gondan

According to Gondan, the patrol boats are conceived for long range sailing and designed and equipped for surveillance missions, the fight against drug trafficking and irregular immigration as well as protection of the marine environment, in the field of the tasks of the Guardia Civil.

The Billion Dollar Challenge

Panama Canal expansion will cost operators, insurers

1B

Increased traffic and larger ships may raise insured cargo values by over $1 billion a day

As the Panama Canal prepares to celebrate its 100th anniversary, insurers are warning of the increased risks that will arise from the plan to double the cargo-carrying capacity of the world's most famous canal.

In a report entitled *Panama Canal 100: Shipping Safety and Future Risks*, Allianz Global Corporate & Specialty (AGCS) identifies that the value of insured goods transiting the canal zone may increase by over $1 billion per day following completion of the Third Set of Locks Project, which will see two new sets of locks built, creating a third transit lane for larger ships.

Today, more than 12,000 ships navigate the canal each year, a number that should increase following the anticipated opening of the new locks in 2015. It is forecast the expansion will enable between 12 and 14 larger vessels per day, or approximately 4,750 additional ships per year, to pass through the canal. Of particular significance is that many of these ships are expected to be new-Panamax class container vessels of 12,600 teu, which are almost three times larger than the existing largest vessels able to access the canal (4,400 teu).

With approximately 3 percent ($270 billion) of world maritime commerce ($9 trillion) already transiting the Panama Canal every year, the safe passage of vessels is critical. However, AGCS warns the increased traffic and larger vessels may challenge the Panama Canal's improved safety record over the past decade with the risks exacerbated through the initial period of the canal opening.

3%

Approximately 3% ($270B) of world maritime commerce ($9 trillion) already transiting the Panama Canal every year.

"Larger ships automatically pose greater risks," said Captain Rahul Khanna, AGCS's Global Head of Marine Risk Consulting. "The sheer amount of cargo carried means a serious casualty has the potential to lead to a sizeable loss and greater disruption."

Post-expansion, if operating at full projected capacity, AGCS estimates that this could result in an additional $1.25 billion in insured goods passing through the canal in one day, with larger ships playing a critical role in increasing throughput capacity.

An additional element to consider, and one that has been at the forefront of many salvage conference agendas for many years as vessels grow increasingly large: such vessels can pose serious salvage challenges in a congested shipping environment, even potentially leading to blockages. In the event of an accident there may be an insufficient number of qualified experienced salvage experts available to handle the ships.

AGCS believes training is key to mitigating the new risks involved, both in the canal region itself and in affected ports. "The expansion of the Panama Canal will represent a new shipping environment for many mariners," said Captain Khanna. "Due to the increase in the number of larger vessels passing through this important waterway the level of training provided to pilots will be extremely important. Attempting to maneuver one of these vessels through such a restricted space in itself creates a much bigger hazard." The Panama Canal Authority has invested heavily in training, including plans to charter a post-Panamax ship to practice maneuvers through the new lane.

Losses in Perspective

While the focus is on potential losses, it's worthy to note that the Panama Canal region has a steadily improving safety record, with only 27 shipping casualties over the past decade and just two total losses. This accident rate of around 1 in every 4000 transits compares favorably with other major waterways such as the Suez Canal (1 in 1100 transits) and the Kiel Canal (1 in 830 transits). As the most frequently transiting types of vessel, bulk carriers (11), cargo ships (9) and container ships (9) dominate the canal's casualty list, collectively accounting for over 75 percent of all incidents since 2002.

2

The Panama Canal has a strong safety record, with only 27 shipping casualties over the last 10 years, and only two 'total losses'

Vard to Design, Build PSV for E.R. Offshore

(Image courtesy of Vard)

Vard Holdings Limited won a contract for the design and construction of one Platform Supply Vessel (PSV) for E.R. Offshore. The vessel is a multifunctional PSV of VARD 1 08 design measuring 81 x 18m and a cargo deck area of 830 sq. m. The vessel will be prepared for standby, rescue, firefighting and oil recovery operations, and it will be built at the Vard Vung Tau yard in Vietnam for delivery in Q2 2016.

E.R. Offshore has also taken over the contract for a sister vessel from Carlotta Offshore.

This vessel is also under construction at Vard Vung Tau with an expected delivery in Q3 2015.

E.R. Group consists of different companies founded by Erck Rickmers, and employs a total of 4,000 people. While E.R. Schiffahrt is a ship owning and ship management company with a fleet of more than 100 container vessels and bulk carriers, E.R. Offshore specializes on offshore vessels. The company was established in 2006 and currently manages a fleet of 13 Platform Supply Vessels and Anchor Handling Tug Supply Vessels. The VARD 1-Series comprises a range of Platform Supply Vessels designed by Vard Design in Ålesund, Norway.

OSV Power

The Ulstein Verft subsea newbuild Island Performer was built for Island Offshore

(Courtesy of Ulstein Group/Marius Beck Dahle)

The continued maturation of Offshore Service Vessel design is embodied in recent contracts and deliveries.

Ulstein Verft subsea newbuild Island Performer was built for **Island Offshore** to be a flexible, RLWI/IMR vessel, destined to serve its first five years for FTO in the Gulf of Mexico. "The vessel is customized to suit the scope of work in the FTO contract, in which RLWI (Riser-less Light Well Intervention) and IMR (Inspection/Maintenance/Repair) are the main tasks. She is able to perform operations at depths down to 3,000m," said Håvard Ulstein, Managing Director, Island Offshore.

Island Performer is a next generation subsea vessel from Ulstein, with large accommodation, storage and lifting capacities. It meets the highest standards for station keeping, redundancy and dynamic positioning (DNV GL class notation DYNPOS AUTRO, equivalent to DP3). Additionally, operability in DYNPOS AUTR (DP2) operational mode is maximized due to the 'Operation+' feature with a three-split configuration on main machinery. This set-up allows the vessel to retain system integrity and to continue operations uninterruptedly even after a substantial single system failure.

A shelter deck is stretching all the way past the main moon pool and aft to the main crane. This increases the operational window for moon pool work and offers a shielded space for various equipment.

Arranged on the shelter deck is a multi-skidding system for handling 100-tonne skidding pallets.

The design also includes a heavy-load cargo deck for transporting equipment for a multitude of operations and construction work.

Island Performer has a crew capacity of 130, and in case of evacuation, each of the lifeboats on the starboard and port sides can accommodate everyone on board. Carrying the patented ULSTEIN X-BOW, the vessel has reduced speed loss in head seas, resulting in reduced fuel consumption and emissions to air.

FTO is a joint venture between FMC Technologies, Edison Chouest Offshore and Island Offshore.

Hornbeck Offshore Services in Covington, La., co-founded by Todd Hornbeck in 1997, has quickly emerged as a leader in the offshore sector, and today boasts a staff of nearly 2,000 in Covington and Golden Meadow, La.; Houston; Brazil and Mexico.

"We have built one of the most diverse and capable fleets of high-specification vessels servicing oilfield and select specialty markets," said Todd Hornbeck. "We're expanding through one of the world's largest new construction programs to deliver twenty-four 300 class vessels - including five multi-purpose support vessels featuring helidecks and subsea cranes." The mid-point of that program is approaching. The company's fifth OSV new-build program is valued at more than $1.25 billion and consists of four 300 class OSVs, five 310 class OSVs, ten 320 class OSVs and five 310 class MPSVs. As of early June, Hornbeck had placed eight vessels in service under that program, with the remainder to be delivered into 2016. As of June 1, the company's operating fleet consisted of 55 new generation OSVs and four MPSVs.

St. Johns Ship Building of Palatka, Fla., delivered the Sea Service, a 157-ft. offshore service vessel (OSV) for A. R. Singh Contractors Ltd. The vessel is an addition to the A. R. Singh Contractors Ltd. fleet and will expand the company's reach into the Caribbean offshore market. This vessel is the second OSV built by St. Johns for A. R. Singh Contractors. Sea Strength is a twin screw vessel powered by two Caterpillar C32 marine type engines rated at 1000 hp each at 1,800 rpm. It features a Schottel bow thruster unit driven by a Caterpillar C12 diesel engine rated at 385 hp at 1,800 rpm and two Caterpillar C4.4 diesel engine powered generator sets, each rated at 99 KW. The OSV is designed to be less than 500 gross tons ITC, have an International Load Line issued by Panama and comply with the Code of Safety for Caribbean Cargo Ships (CCSS Code). The interior is equipped with state of art electronics, a commercial style galley equipped with a walk in freezer and accommodations

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St. Johns Ship Building of Palatka, Fla., delivered the Sea Service, a 157-ft. offshore service vessel (OSV) for A. R. Singh Contractors Ltd. The vessel is an addition to the A. R. Singh Contractors Ltd. fleet and will expand the company's reach into the Caribbean offshore market.

for 10 passengers and 10 crew members.

Seattle-based Naval Architecture and Marine Engineering company **Guido Perla & Associates, Inc. (GPA)** won a contract to deliver the Design Package and Class Approval Package for two GPA 150M FSVs. The ships for Enterprise Shipping, awarded in a contract to build two Fast Supply Vessels for Petróleos Mexicano (Pemex) earlier in 2014, will be built at Maritima de Ecologia S.A. de C.V., (Marecsa), in Mazatlán, Mexico. GPA developed a shallow draft ship with exceptional seakeeping capabilities designed to offer a stable working platform to its crew. The 52- x 10-m vessels provide accommodations for nine crew and can transport 80 passengers with a deck cargo capacity to transport up to 250 mt of supplies on a 261 sq. m. of clear deck area. Equipped with four engines (7,200 hp total), two bow thrusters (150 hp each) and three auxiliary engines (2x 250 kW, 1x 99 kW), the conventionally driven 350 mt dwt vessels will have a service draft speed of 20 knots.

The FSVs will be constructed in full compliance to meet ABS, +A1, AMS, H.S.C. Crewboat Notation and DPS-1 requirements. Construction of the vessels is expected to commence this summer, with delivery expected in 2016.

CMM took delivery of a **Damen** Platform Supply Vessel 3300. The 80-m, 3,300t dwt vessel CMM Gravity will be deployed in the Brazilian waters from June 2014 on a 4+4 year contract with Petrobras. For CMM (Compagnie Maritime Monégasque S.A.M.), the vessel will mark a next step in its plans to expand in the offshore space and expand its offering by developing its capabilities as an OSV operator. It is the yard's seventh delivery of Damen's new mid-size PSV 3300 design. This vessel will be compliant to Petrobras specifications, including Petrobras Annex V.

Next to the 728 sq. m. deck with a 1,500-metric-ton deck load capacity, the vessel will feature extensive tank capacities to handle different types of fluids and bulk. The vessel has a DP2 system which relies on four generator sets, two Azimuth thrusters and two bow thrusters. The 14-knot, 16.2-m wide (molded) vessel will be LR-classified for worldwide deployment. The most remarkable feature includes the bulb-less axe bow as developed by Damen, and the bright red that CMM has selected for its corporate color.

Cat power was the choice for four ocean-going towing vessels designed by **Ulstein Design and Solutions**. Each vessel will have four 9 M 32 C propulsion engines, rated at 4,500 bkW at 600 rpm. Also onboard each vessel will be three Cat C32 auxiliary generator sets rated at 940 ekW at 1,800 rpm as well as one Cat C9 generator set to provide emergency power. All four vessels will be equipped with two AEM shaft generators rated at 3,150 ekW at 1,200 rpm. Each vessel has two Cat BCP1330F main propellers, two BTT625 tunnel thrusters and two BTT419 tunnel thrusters. The MaK and Cat power and propulsion solutions will be delivered over the course of the next year.

Designed to tow large structures such as offshore drilling rigs, Ulstein SX157 design vessels offer a 300-ton bollard pull and are capable of operating at full loads for 45 days without refueling. The vessels will be constructed at the Niigata Shipyard in Japan.

Atlantic Towing Limited (ATL) won a new 10-year firm contract, plus a total of 15 years of options at the

Image: Caterpillar Marine

Cat power was the choice for four ocean-going towing vessels designed by Ulstein Design and Solutions. Each vessel will have four 9 M 32 C propulsion engines, rated at 4,500 bkW at 600 rpm. Also onboard each vessel will be three Cat C32 auxiliary generator sets rated at 940 ekW at 1,800 rpm as well as one Cat C9 generator set to provide emergency power.

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charterers' discretion, with ExxonMobil Canada Properties and Hibernia Management and Development Company Ltd. (HMDC) for four new state-of-the art Platform Supply Vessels operating out of St John's, NL. The first ships for the contract will be delivered in 2016 and will join Atlantic Towing's current fleet of eight offshore support vessels in Atlantic Canada. The new ships, to be designed and built by **Damen Shipyards Group** of the Netherlands, will deliver a number of environmental benefits including Clean Design designation with a diesel electric power plant, the latest environmental control equipment, wave piercing bow design, and enhanced crew comfort.

"This exceptional contract - the largest in our company's history - will increase our fleet size, our workforce and our overall contribution to the economy in Newfoundland and Labrador," said Sean Leet,General Manager, Atlantic Towing. "We expect hiring of approximately 100 new positions, which will provide a great opportunity for local seafarers, to begin in December 2015."

Polar Code Afoot

The IMO is on the verge of adopting the Polar Code, something that is important and long overdue.

BY DENNIS BRYANT

The International Maritime Organization (IMO), a specialized agency of the United Nations, is on the verge of adopting the Polar Code. When implemented, it will establish the first mandatory rules for operation of commercial vessels in polar waters. This important step is long overdue.

(Photo: Courtesy DNV)

Background

On 18 January 2010, the IMO adopted voluntary guidelines for ships operating in polar waters (Res. A.1024). These guidelines were based on those approved jointly by the Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) in 2002. The critical words were voluntary and guidelines. Commercial ships operating in polar waters were not required to comply: most did, but some did not. In addition, the guidelines, while helpful, were somewhat vague. The guidelines were printed on 31 pages, if you don't count the two pages of boiler-plate resolution introduction. The draft Polar Code (for which the boiler-plate introduction has yet to be written) is printed on 45 pages. Topics with increased emphasis in the draft mandatory version include stability in damaged conditions, safety of navigation, communications, voyage planning, manning and training familiarity, and prevention of pollution. Probably the most significant change between the guidelines and the draft mandatory Polar Code is the provision for issuance of a Polar Ship Certificate indicating the environmental and operational capability for which the ship has been designed for operation in polar waters. Coupled with that will be the requirement that every covered ship on a voyage that is in whole or in part in polar waters to have on board a valid Polar Ship Certificate and a Polar Waters Operation Manual. Thus, once the new Polar Code comes into force, commercial vessels that elect to operate in polar waters must have been constructed for such voyages and must also be operated in a manner consistent with the unique hazards of such voyages. This has not always been the case previously.

Recent Polar Water Casualties

• **On 23 November 2007, the passenger vessel EXPLORER struck an ice floe in the Bransfield Strait** near the South Shetland Islands in the Antarctic Ocean. The hull was breached and the subsequent flooding could not be controlled. The ship sank about 15 hours afterwards. Fortunately, the passenger vessel Nordnorge happened to be nearby. It promptly responded to the distress call and rescued all 100 passengers and 54 crew. The marine casualty investigation stated that the major cause of the casualty was the mistaken impression of the master that he was encountering first-year ice when, in fact, he was sailing into much thicker and harder land ice. The master was very experienced in Baltic waters, but was unfamiliar with the type of ice encountered in Antarctic waters.

• **On 4 December 2008, the passenger vessel CIUDAD DE USHUAIA grounded in waters of the Antarctic Ocean** off the Antarctic Peninsula. The hull was breached, but flooding was controlled.

Two fuel tanks were damaged. The eighty-nine passengers were evacuated to a Chilean navy vessel which had responded to the distress call.

• **On 26 December 2009, the passenger ship CLELIA II was pushed onto the rocky shoreline** of Petermann Island in the Antarctic Peninsula. The grounding damaged the starboard propeller. The ship was able to maneuver using its port propeller. The passenger vessel Corinthian II, operated by the same company and then located only eight miles away, quickly arrived on scene. It escorted the CLELIA II on a multi-day

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Cummins Mid-South

Crystal Cruises recently announced that it is accepting bookings for a "once-in-a-lifetime expeditionary voyage" by the passenger ship Crystal Serenity from Anchorage, Alaska through the Canadian Arctic Archipelago to Greenland and New York, with a scheduled departure 16 August 2016. Putting aside for a moment the obvious cabotage issues, one wonders at taking yet another non-ice-classed vessel filled with civilians into polar waters.

journey across the Drake Passage back to its homeport of Ushuaia, Argentina. The ship was taken out of service for the remainder of the season so that repairs could be performed.

• **On 27 August 2010, the passenger vessel CLIPPER ADVENTURER grounded** on a submerged rocky pinnacle in Coronation Gulf, Nunavut while transiting Canadian waters of the Northwest Passage. On 29 August, all 128 passengers were transferred to the CCGS Amundsen, which fortuitously happened to be conducting survey and resupply operations in the general vicinity. The CLIPPER ADVENTURER was refloated on 14 September and escorted to Epworth, Nunavut. There was minor pollution and no injuries. Amazingly, the weather during the eighteen days the ship was aground was almost ideal. The rocky pinnacle had been previously identified and reported in a Notice to Mariners (although not yet charted), but the bridge team had not actively accessed the local Notices. The ship's forward-looking sonar was non-functional at the time. The voyage plan relied on a chart with a route that had been surveyed based on a single line of soundings. Regardless, the ship was proceeding at full sea speed when it grounded.

• **On 21 February 2011, the yacht BESERK went missing in the Ross Sea off Antarctica.** The yacht had brought two trekkers ashore in their attempt to transit overland to the South Pole. An extensive search by the governments of New Zealand, Norway, and the United States, as well as several private vessels, found the empty, damaged lifeboat and several packages of drinking water, but no sign of the yacht or its crew.

• **In January 2013, the passenger vessel SILVER EXPLORER encountered heavy weather and sustained damage** while on a cruise from Ushuaia to the South Georgia Islands and the Antarctic Peninsula. None of the 133 passengers were injured, but four of the 113 crew suffered minor injuries. The vessel's next voyage was cancelled so that repairs could be performed.

• **On 17 April 2013, a fire broke out on the fish factory vessel KAI XIN in the Antarctic Ocean** approximately 45 mile northwest of Base O'Higgins. The 97 crew members and workers were rescued by another fish factory vessel. The fate of the KAI XIN, left adrift and burning, is unknown.

• **On 24 December 2013, the passenger vessel AKADEMIK SHOKALSKIY became beset in Antarctic ice** near Cape de la Motte. The Chinese research icebreaker Xue Long and the Australian research icebreaker Aurora Australis rushed to the rescue. The Chinese vessel also became beset. The Australian vessel stood off so as to avoid the same fate. On 2 January 2014, the Chinese vessel's embarked helicopter was used to ferry the 52 passengers from the AKADEMIK SHOKALSKIY to the Australian vessel. The passenger vessel and the Chinese vessel freed themselves of the ice on 7 January, shortly before the US Coast Guard icebreaker Polar Star was due to arrive on scene.

• **On 12 July 2014, the US Coast Guard icebreaker Healy diverted from its National Science Foundation research mission in the Arctic in order to assist a sailboat** trapped in the ice approximately 40 miles northeast of Barrow, Alaska. The sailboat ALTAN GIRL was en route from Vancouver, British Columbia to eastern Canada via the Northwest Passage when it was beset. The USCGC Healy towed the sailboat through twelve miles of ice to open water.

Polar Excursions

As illustrated by the above summary of recent marine casualties, some of the vessels currently navigating polar waters are not constructed or operated in a manner to meet the harsh conditions. In addition, some of the operators do not properly take account of the severe lack of adequate charting and infrastructure in those remote areas, as well as the extreme weather conditions often prevailing. Several commercial passenger ships [and one commercial bulker] have transited the Northwest Passage, so far without significant difficulty (except for the CLIPPER ADVENTURER noted above), but mariners cannot always count on good luck. Crystal Cruises recently announced that it is accepting bookings for a "once-in-a-lifetime expeditionary voyage" by the passenger ship CRYSTAL SERENITY from Anchorage, Alaska through the Canadian Arctic Archipelago to Greenland and New York, with a scheduled departure 16 August 2016. Putting aside for a moment the obvious cabotage issues, one wonders at taking yet another non-ice-classed vessel filled with civilians into polar waters.

Next Steps

The IMO's Marine Safety Committee, at its meeting (MSC 93) earlier this year, approved its portion of the draft Polar Code. That portion will go before the November meeting (MSC 94) for formal adoption. The environmental portion of the Polar Code will be considered for approval in October by the IMO's Maritime Environment Protection Committee (MEPC 67). It is scheduled to be considered for adoption at the May 2015 meeting (MEPC 68). If all goes according to plan, the mandatory Polar Code will enter into force on 1 January 2017.

No one is asserting that the draft Polar Code is perfect. Certain topics, such as ballast water management, have been omitted and there are other topics that could be expanded, such as the provisions addressing manning and training familiarity of navigating officers for polar water operations. But, the new Polar Code represents a major step forward and should significantly improve the safety of commercial vessel operation in polar waters at a time when such operations are increasing.

The Author

Dennis L. Bryant is with Maritime Regulatory Consulting, and a regular contributor to Maritime Reporter & Engineering News as well as online at MaritimeProfessional.com.

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Logistical Scenario Analysis for

Hydrodynamic Applications

BY JORRIT-JAN SERRARIS

To calculate the operability of the whole logistics chain, rather than only individual operations, MARIN has developed the hydrodynamic scenario analysis program ScenSim.

The uptime, or operability, of a specific operation can be calculated with existing methods and tools in different ways. However, each specific operation is often just a small stage in a long chain.

When planning an operation a key parameter is to know the efficiency and duration of the operation. When the operation is a continuous process, such as the iterative transport of cargo between locations, or when the operation consists of a successive series of operations, such as installing an offshore wind park, variations in weather and the availability of cargo can impact the operation. The varying nature of these 'disturbances' and the effect they have on the complete logistical chain make it difficult to determine the efficiency or duration of the whole operation. To support developers, planners and engineers to determine the efficiency of a logistical chain from a hydrodynamic point of view, MARIN developed ScenSim.

The program simulates the logistics of shipping and offshore operations by combining MARIN's existing hydrodynamic programs into a logistic scenario. A scenario can consist of multiple vessels, locations and iterations interacting with each other.

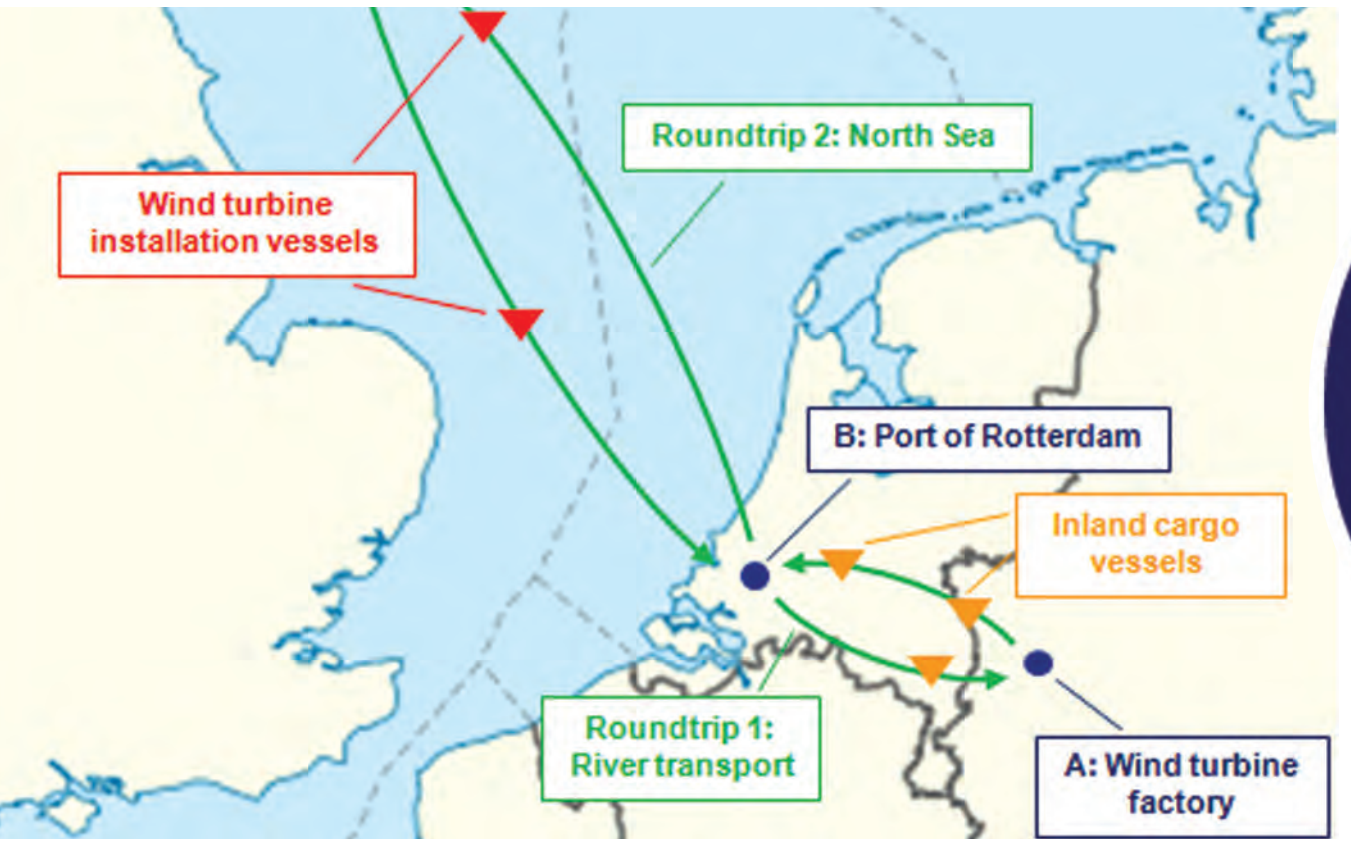
ScenSim is based on a time step approach. Initially the operability of each vessel is calculated at every time step, then the interactions between vessels, cargo and locations are determined and finally the status of each object is updated. At the end time of the simulation the program shows how much cargo was handled and transported during the whole simulation and the total time required to perform the whole scenario.

The scenario analysis program facilitates the simulation of the complete logistical chain from a hydrodynamic point of view. ScenSim can be used to indicate bottlenecks in the logistical chain so these can be eliminated, thereby increasing uptime and improving the overall efficiency.

The Author

Jorrit-Jan Serraris is senior project manager at the Offshore Department of MARIN, the Maritime Research Institute Netherlands.

e: j.w.serraris@marin.nl



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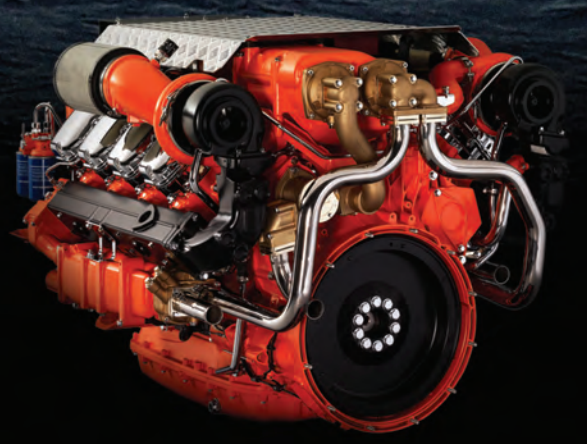

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Challenging the Myths of

Pirate Violence

BY DIRK STEFFEN

Photo: Karsten von Hoesslin

"Mr Abdul", a senior pirate leader from the Karimun gang, poses for the camera. The high number of reported petty attacks in South East Asia belie the high potential for lethal violence in the region.

"In the last five years, pirates have killed at least 411 fishermen and wounded at least 1,000 more, suggested Mujibur Rahman, Chairman of Cox's Bazar District Fishing Trawler Owners Association (DFTOA). According to the DFTOA, pirates attacked more than 1,000 fishing boats, abducting more than 3,000 fishermen, killed over 45 and collected more than $1.28 million in ransoms from fishery owners of two coastal towns – Chakaria and Maheshkhali, alone from late 2011 to late 2012," reported a Bangladeshi paper in April 2013. If true then this staggering level of violence eclipses that of any other reports of actual or alleged pirate violence – be it in Africa or South East Asia. Like most forms of maritime "piracy" (which often technically do not even qualify as piracy under the UNCLOS definition) Bangladeshi piracy is an acknowledged local phenomenon that primarily affects locals and local or regional economic interests. International media and watchdogs often only sit up and pay attention when international shipping is affected. Hence, whenever a region grabs the headlines for pirate attacks, we read bizarre news about "the world's most violent pirates", but only when their attacks cause casualties amongst the crews of internationally-trading vessels. Some of this has a whiff of fear-mongering about it and generally leaves seafarers confused and frightened about the nature of the piracy threats in the various parts of the world. This is not to say that those casualties reported are not a cause for concern, but what appears to be lacking is a discussion informed by the most basic analysis of the facts. For starters, violence levels in piracy worldwide would appear to be much higher than what is commonly circulated. Like the piracy phenomenon itself, violence is underreported when incidents do not meet certain legal criteria or definitions of piracy. This is legally correct, but it is misleading when assessing the potential for violence (and thus planning appropriate risk mitigation) since the local perpetrators are often the same who commit crimes against local shipping or at least they hail from similar backgrounds. This is true for Somalia, where many of the original pirates were involved in criminal activity against Somali and Yemeni fishing vessels. It is also true for the Gulf of Guinea, where the same Niger Delta youths who prey on inshore traffic and kidnap oil workers are also hired by organised criminals to hijack tankers. Finally, in South East Asia, local criminals (including active or former military personnel) form the operational nucleus for many of the maritime scams including tug-jacking and product theft.

Even when scrutinizing the officially reported violence, the difference in numbers hinges on the definition of violence, the time frame and the nature of the incidents included. This is apparent when reading Oceans Beyond Piracy's "State of Piracy 2013", which includes psychological abuse or the "UNOSAT Global Report on Maritime Piracy - a geospatial analysis 1995-2013", which includes the threat of violence and even "mutiny". However, a few numbers will serve to illustrate how "global" numbers can deceive and distort when not placed in their proper (local or regional) context.

Somali Piracy

The nature of this type of piracy was directed, at least for some years, primarily against ocean-going shipping and from 2008 onwards monitored by international naval forces. This resulted in a relatively high degree of accuracy of reporting. According to a study made by Leslie Edwards of Compass Risk Management, of the 82 fatalities between 2007 and 2012, eight arose from weapons effects during the initial attack, 23 from neglect and illness during captivity and death by other causes, but the highest proportion of seafarers – 43 – were killed during rescue operations or clashes with naval forces. In spite of many threats only eight seafarers were killed by Somali pirates in "cold blood" after the initial hijack. Initial levels of non-lethal violence were also low - around 10% of the hijacked ships reported such violence up to about 2009/10, but increased with longer hijack durations.

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Stian Tollås - AB

We met Stian Tollås while he was working on board the Island Valiant, Anchor Handling Vessel - UT 787 LCD. Explore the passion and commitment behind 40 years of UT design. You can find Stian’s story and many more at www.rolls-royce.com/UTstories

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Photo: Dirk Steffen

Crews of local craft, like this Nigerian service boat often bear the brunt of criminal violence in the maritime domain.

Photo: Adrian Kriesch/Alexander Drechsel

Is there a general propensity for violence in West Africa? The author finds out in an exchange with a Benin Navy boarding team member during exercise OBANGAME EXPRESS 2014.

South and South-East Asia Piracy

The local nature of piracy in Asia, as described above, makes it less newsworthy for the international community. When international shipping (though often in a regional context) is affected, like tanker hijackings, then it frequently involves a strong collusive element involving government security forces, hijackers and owners that does not encourage reporting. However, isolated reporting like the one on Bangladeshi fishermen, or the killing of seven Thai seamen off Songkhla port in October 2013, or the slaying of nine Filipino seafarers in the southern Philippines in December 2013 (with some of the victims being beheaded), suggests a particularly ruthless streak amongst some of Asia's pirates that has no equivalent in Africa. Historically, many of South East Asia`s ghost ship's original crews in the 1990s were also disposed of by the hijackers – many disappeared without a trace.

Gulf of Guinea Piracy

It has become fashionable to brand the pirates of the Gulf of Guinea as particularly violent. This perception is largely based on anecdotal reports that date back to the 1970s, where European crews faced down pirates on the decks of their ships. It was later reinforced through the rise of the Niger Delta youth militias, who espoused violence as the only means to address their grievances. The level of aggression amongst those youths is felt to be intimidating even by the Niger Delta population, as a number of studies on the Niger Delta Youths have shown. Hence it is not a "natural" Nigerian, let alone West African, trait. Some of this militant attitude carried over to commercially-driven piracy, although the focus of violent groups in the Niger Delta remains on domestic issues, with most of the brutality being reserved for gang fights and disposal of political opponents.

In order to make Nigerian piracy comparable to that in other regions, the focus has to be on the post-insurgency period commencing in October 2009 to eliminate insurgency-related effects.

Between that date and June 2014 Risk Intelligence has documented 738 attacks in West Africa – of which consistently between 80-100 incidents per year occurred in the Gulf of Guinea. Twenty of those incidents involved fatalities – all in or near Nigerian waters. Seven of those 20 incidents involved government security forces. Of the 37 fatalities recorded in that period, 15 were security personnel.

Of the remaining 22, 12 were killed in incidents on inshore waterways. The remaining ten were on offshore vessels, fishing vessels and foreign merchant vessels. Four killings took place in cold blood – two of them on foreign vessels.

More generally, African pirate violence comes across as casual violence, lack of restraint or, especially in the Gulf of Guinea, poor weapons discipline. A study by Risk Intelligence of 93 tanker hijackings in the Gulf of Guinea between 2010 and 2013 showed that the number of weapons discharges had increased, but had not caused a rise in casualties. Crew testimonies suggest that both in East and West Africa drug and alcohol abuse play a major role in attacker violence and erratic behaviour. As the above figures for the Gulf of Guinea show, most casualties have involved security forces, and inshore incidents - not attacks on transiting foreign-flagged vessels. Gulf of Guinea pirates are well armed, and often intimidating, but in terms of fatal attacks there is no reason for them to be singled out over pirates elsewhere.

In the case of Gulf of Guinea – or specifically Nigerian – pirates, there is the mantra that they will attack even when there is an embarked government security force team. This explanation exhibits a fundamental misunderstanding of the nature of Nigerian pirates. They attack, and kill, because they are facing government security forces. The reason is that the pirates are the same youths who face both oppression and extortion by corrupt security forces in the Niger Delta. This combative attitude in the face of armed opposition is largely unique to Nigeria (or Nigerian pirates with a Niger Delta background) and not reflective of general pirate behaviour in West Africa. It also suggests that embarking government security forces may not be as effective in reducing the risks to crews as the embarkation of PCASP has been in the Indian Ocean.

Conclusion

Whatever the actual numbers of Bangladeshi fishermen killed, it is a good example of a specific local situation with unique drivers that are often overlooked by analyses on pirate violence which focus on numbers and trends only in the context of international shipping. The local context provides explanations as to when and where – and against whom – violence can be expected and also as to the true potential for violence in any given region of the world.

Pirate violence is an emotionally charged subject. Better understanding hinges on more accurate and comprehensive reporting and informed analysis. It also requires a common understanding of what constitutes "violence". Fear-mongering and perpetuation of unfounded myths are unhelpful in alleviating anxieties amongst seafarers and in preparing them for dealing with the problem.

Security companies and specialized media in particular have a responsibility to not stoke the flames for fear of losing relevance. Often as not, good security advice constitutes what enables clients to make sound commercial decisions and protect their crews more effectively when based on the most objective facts available.

The Author

Dirk Steffen is the Director Maritime Security for Risk Intelligence. He has been covering the Gulf of Guinea as a maritime security consultant and analyst since 2004.

e: ds@riskintelligence.eu
w: www.riskintelligence.eu
t: +45 70 266330

Ballast Water Leadership

Admiral Paul Zukunft, the new U.S. Coast Guard Commandant, could fill the BWT leadership void.

BY RICHARD J. DOUGLAS

(U.S. Coast Guard photo by Petty Officer 2nd Class Patrick Kelley)

Can new USCG Commandant Adm. Paul Zukunft fill the Ballast Water Leadership void?

Global efforts to combat the spread of invasive species in ballast water are hampered by a leadership void so serious that in April the International Chamber of Shipping (ICS) discouraged further ratifications of the International Maritime Organization's (IMO) invasive species convention. Admiral Paul Zukunft, the new U.S. Coast Guard Commandant, could fill that void and get those efforts onto the right track.

The United States has been blessed with strong Coast Guard Commandants. Around the Gulf of Mexico, for instance, the quiet, serious demeanor of Admiral Thad Allen was crucial to recovery from Hurricane Katrina and efforts to end the BP Macondo oil well disaster. If anyone ever deserved a Congressional gold medal, it is Admiral Allen.

Our nation's newest Coast Guard Commandant, Admiral Paul F. Zukunft, took command on May 30. When Admiral Zukunft commanded the law enforcement-oriented Joint Interagency Task Force – West (JIATF-West) in Hawaii, I had the privilege of working with him from my post as Deputy Assistant Secretary of Defense for Counter-narcotics in the Pentagon. Zukunft and Allen were cut from the same cloth.

No American operational commander is responsible for ocean areas more vast than those within the JIATF-West commander's portfolio. Admiral Zukunft's duties as JIATF-West commander embraced diplomacy and maritime law enforcement cooperation with the entire Pacific Rim. Confronting bad actors of every stripe from pirates to traffickers, Zukunft and the Coast Guard wrote new chapters in the annals of international and interagency cooperation. That leadership ability and the Commandant's established international presence are badly needed today to correct what a former ICS president called the "chaotic fiasco" of the international ballast water control effort.

How do we state the problem simply?

A seasoned maritime industry actor attributes turmoil in the ballast water field to "haste to produce [the IMO invasive species convention] before the technology was ready." There is international consensus over the existence, scope, and consequences of the invasive species problem, but it is difficult to find consensus about much else, including standards on technology and sampling.

Speaking for industry, the ICS pointed in April to a "lack of robustness" with the IMO type-approval process for ballast water control technology, and with determining ballast water sampling criteria to be used by governments which check ballast tanks of vessels calling at their ports. These gaps cause uncertainty for ship owners pressed to install costly equipment which may later fail IMO scrutiny and facing a patchwork of water sampling standards at multiple ports on a single voyage.

Chaos indeed.

The ICS has also underscored an urgent need for 'grandfathering,' under all eventual standards, type-approved equipment already installed by ship owners trying valiantly to comply with unclear international norms in an uncertain regulatory environment.

Is international consensus over technology and sampling methodology achievable? Certainly. In aviation, for example, standardization of aircraft maintenance procedures, fuel sampling, and authentication of spare parts is widespread. Aircraft mechanics in Bishkek and New York working on a Boeing 777 are likely to understand each other's duties well because of global application of FAA standards. In telecommunications, international rules on use of the electromagnetic spectrum are observed across a diverse landscape of languages and

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culture. In the hydrocarbon industry, sampling and testing procedures used in Caspian production fields are familiar to producers in Oklahoma.

If standardization is achievable, then what's the trouble in the ballast water camp?

Why does the ICS write almost acidly in an April 8 press release that instead of searching for a "road map" to address compliance issues, IMO governments opted instead to study and (implicitly) duck the problem? For many governments, procrastination until the wolves are at the door is easier than grappling with hard issues. In the ballast water technology field, global shipping and its regulators already know how to deal with complex technology. What they lack is strong leadership to resolve issues like those which ICS put on the table.

Enter Admiral Zukunft. What could he do about this situation?

First, and perhaps most important, he could lead the U.S. Executive branch to internal consensus over U.S. ballast water control policy. Admiral Zukunft is a new figure on the block, and can provide fresh perspective, energy, and strong interagency leadership where it is needed. To make a difference internationally, the Coast Guard and Environmental Protection Agency must speak with one voice on standards and sampling.

Second, I would encourage Admiral Zukunft to take on the global ballast water regulation problem aggressively. It is an important problem aggravated by IMO member state procrastination and no firm hand on the rudder. Coast Guard and Navy personnel are trained to exercise leadership when confronted with a shipboard fire, with flooding, or with other dangers at sea. This means that someone on the scene will step forward and forcefully state – "I am in charge." The global ballast water "fiasco" needs this.

Diplomacy is required, of course, in a field with major international implications. But Admiral Zukunft is already a well-known quantity in nations which operate much of the world's commercial shipping. My hunch is that most would welcome his leadership on the ballast water control issue, as all nations potentially are affected by a leadership void. Whether one stands before the town council or a multilateral specialized technical organization like the IMO, leadership is no picnic. But it is vital in all settings, and no less so on the ballast water front. A distinguished officer like Admiral Zukunft could craft a consensus on how to proceed on ballast water technology under the IMO convention when it comes into force, how to reconcile the convention's technology provisions with member state regimes, and how to build a standard sampling methodology that will provide ship owners and states the certainty they require. I believe that this work could be accomplished without doing violence to the convention's basic integrity, and within the IMO framework.

Global shipping needs the ballast water regulation "road map" whose absence was forcefully noted by the ICS in April. In my judgment, Admiral Zukunft has the leadership skills required to chart that course. It is a worthy undertaking. There is a compelling need now for someone with his gravitas, professional knowledge, and credentials to step forward and announce: "I am in charge."

The Author

Organizer of Mexico's first ballast water technology conference, Richard Douglas advises transport firms about non-OECD markets. He is also a lawyer, a veteran of Iraq and the Bush Pentagon, and began adult life in a Navy engine room.

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Floating Production

What's New in August 2014

BY JIM MCCAUL, IMA

There are 320 oil/gas floating production units are now in service, on order or available for reuse on another field. FPSOs account for 64% of the existing systems, 79% of systems on order. Production semis, barges, spars and TLPs comprise the balance. Total oil/gas inventory is the same as last month – but two units on order last month (N'Goma FPSO and Delta House Semi) were completed and are now in the active inventory.

Another 29 floating LNG processing systems are in service or on order. Liquefaction floaters account for 17%, regasification floaters 83%. No liquefaction floaters are yet in service – all 5 are on order. Total LNG inventory is the same as last month.

In addition, 102 floating storage units are in service, on order or available. (See Chart 1, page 34)

Production Floater Order Backlog

Sixty-three production floaters are currently on order, a reduction of two units since last month. The figure includes 37 FPSOs, 10 other oil/gas production units and 16 LNG processing units. In the later are 5 floating liquefaction plants and 11 regasification terminals.

The backlog of orders has been falling over the past few months as deliveries outpace intake. Backlog is down from a high of 72 units last October. Given expected orders and scheduled deliveries over the next five months, order backlog at end 2014 will likely be in the range of 58 to 60 units.

The declining trend is mostly the result of a wave of orders 24 to 36 months back that created a cluster of deliveries in 2014. Recent orders have been strong – just not as high as deliveries. But there has also been some impact from deferral/rethinking of several projects – e.g., Rosebank, Fram, Fyne, Mad Dog, Cheviot, etc.

Who's Building What

Production and storage floaters are being built in more than 40 locations.

Samsung is building two FLNGs, including the massive Prelude FLNG for Shell.

(Photo: Courtesy Shell)

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Chart 1

Number of Floating Production and Storage Units In Service, On Order or Available for Reuse

(As of August 1, 2014)

	Total	Active	On Order	Available
Oil/Gas Production				
FPSO	213	160	37	16
Production Barge	10	8	2	0
Production Semi	47	41	2	4
Production Spar	22	20	2	0
TLP	28	24	4	0
Total	320	253	47	20
LNG Production				
FLNG	5	0	5	0
FSRU	24	13	11	0
Storage Systems				
FSO	102	92	9	1

Breakdown of Planned Projects by Type of Production System

(As of August 1, 2014)

Type System	# of Projects
FPSO	133
Other FPS	30
FLNG	32
FSRU	21
FSO	15
Total	231

Breakdown of Planned Projects by Location of Field

(As of August 1, 2014)

Project Location	# of Projects
Africa	50
Brazil	44
SE Asia	40
GOM	24
No. Europe	23
Aust/NZ	15
Medit	10
SW Asia	10
Other	15
Total	231

Here's a summary of where various type systems are currently being built.

• **FPSO conversions** – Shipyards in Singapore and China are the principal players in this type activity. Of the 20 FPSO conversions now in progress, 9 are being performed in Singapore. Keppel is converting 6 tankers to FPSOs, Sembawang is converting 2 tankers and Jurong has 1 conversion. Another 8 conversions are being performed in China – 3 at Chengxi and 5 at Cosco Dalian. To meet local content requirements, a portion of topsides completion in around half of these contracts is being performed in Brazil.

• **Purpose built FPSOs** – Korea and Brazil are the main sources of large purpose built FPSOs. Yards in these countries have contracts for 13 of the 17 new FPSOs now on order. In Korea, Hyundai is building 2 FPSOs, Samsung 2 units and Daewoo 1 unit. One of the Samsung units (Egina) will have significant topsides work performed in Nigeria. In Brazil 8 replica FPSOs are being built by Ecovix at the new Rio Grande Shipyard. Elsewhere, 2 FPSOs are being built in China and 2 FPSO hulls are being built in Japan with topsides finishing in Singapore or Brazil.

• **Other oil/gas production units** – Asia is the dominant area for building non-shipshape production units. At the moment 5 of the 10 large purpose-built non-shipshape units on order are being built in Korea. Samsung is building a production semi and Hyundai is building a spar, a TLP and 2 large production barges. The topsides to several units are being completed in the US or Indonesia. Elsewhere, a spar hull is being built in Finland for topsides completion in the US and MMHE is finishing a TLP in Malaysia.

• **FSRUs** – Construction of regas units is fully reserved to Korea and China. Eight FSRUs are now being built in Korea. Samsung is building 4 FSRUs, Hyundai and Daewoo are each building 2 FSRUs. In China, Wison Nantong is building 2 FSRU barges.

• **FLNGs** – Liquefaction floaters are all being built in Asia. In Korea, Samsung is building 2 units, including the massive Prelude FLNG for Shell and the initial FLNG for Petronas. Daewoo is building the second FLNG ordered by Petronas.

In China, Wison is building a liquefaction barge for use in Colombia. All of these units are newly built hulls. In Singapore, Keppel is converting an LNG carrier into an FLNG.

The large role of Asia facilities in this market sector is apparent from the above. Overall, 50 of the 63 current production floater orders are contracted with Asian yards.

In term of number of production floater fabrication/conversion contracts being performed, the Asian share of market is just under 80%.

Backlog of Planned Floater Projects

231 floating production projects are in various stages of planning as of beginning August. Of these, 58% involve an FPSO, 13% another type oil/gas production floater, 23% liquefaction or regasification floater and 6% storage/offloading floater.

Among new projects emerging since last month, LoneStar FLNG, a Texas company, proposes to build an FLNG by inserting a midsection in an existing Moss LNG carrier. The mid-section would contain the liquefaction module and turret. Processing and gas treatment would be on an accompanying cylindrical FPSO or fixed platform. The unit would be capable of processing 1 to 4 mtpa. LNG transfer from the FLNG to transport carrier would be performed in a sheltered area. Among proposed applications is use of the unit for gas export in the US GOM.

Brazil, Africa and SE Asia continue to be the major locations of floating production projects in the visible planning stage. We are tracking 44 projects in Brazil, 50 in Africa and 40 projects in SEA – 58% of the visible planned floating production projects worldwide. Several large projects in Brazil and (less so) Africa will require multiple production units.

Around 12% of the 231 visible planned projects are likely to advance to the EPC contracting stage within the next 12 to 18 months. These projects typically have either entered the FEED phase, pre-qualification of floater contractors has been initiated or bidding/negotiation is in progress. A list of near term projects is provided below.

Another 50% of the visible projects are at a stage of development where the EPC contract for the production unit is likely within the next 18 to 48 months. The remaining 38% of projects are less advanced in planning, with the EPC contract likely 4 to 10 years out.

Outlook for Equipment Orders

Oil demand keeps growing, the threat of conventional supply disruption keeps pressure on finding new sources of oil and a large number of additional deepwater drill rigs are entering service. These are clearly positive indicators for deepwater project starts and floating production system orders.

Importantly, the most basic underlying market driver, price of crude oil, remains supportive of deepwater oil development. As of beginning August, Brent is trading around $106. For delivery at the end the decade, Brent is trading around $99 in the futures market. This pricing level provides solid commercial support to all but the most marginal deepwater projects.

But oil companies have been pulling back on investment in new projects. Barclays' mid-year survey of oil industry executives found that spending by oil majors will be flat in 2014. Earlier the bank projected a 3% increase in spending.

In the deepwater sector, cost escalation is causing companies to slow investment decisions.

The planned $6 billion Bressay heavy oil project in the UK North Sea, for example, hit a cost wall that forced Statoil to rethink the project. Cost escalation caused Chevron to stop, at least temporarily, the $10 billion Rosebank project offshore the UK Shetlands Islands. Commenting on the cost pressures, Technip said in July that "some of our customers are taking a much slower and more combative approach."

Compounding this, shale oil and gas development is increasingly drawing capex resources from energy companies.

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Rystad Energy says "spending on drilling, completion and lease equipment in North American shale plays will reach $140 billion in 2014." The figure is up 10% from 2013 and Rystad expects similar growth in 2015.

Wood Mackenzie expects the Texas Wolfcamp tight oil play alone to draw $12 billion in capital spending in 2014. Some of the growing capital expenditures on shale projects have undoubtedly migrated from deepwater development.

The impact has been to cause some backing off on new deepwater project starts – which may explain why orders for production floaters are within, but at the low end of our forecast range.

We will examine these conflicting underlying market forces in more detail when we issue our new five year forecast of floating production system orders in September.

Project	Country	Operator	Water Depth (meters)	Production Start Possible	Likely Type Unit	Likely Lease or Own	Likely Mooring System *
Sankofa	Ghana	ENI	1000	2017/20	FPSO	Lease	ET
Camela	Angola	Cobalt Energy	1525	2017/18	FPSO	Lease	ET
Bonga Southwest	Nigeria	Shell	1200	2020/21	FPSO	Own	S
Aje	Nigeria	YFP	150	2016/20	FPSO	Lease	S
Chissonga	Angola	Maersk Oil	1355	2017/18	FPSO + TLWP	Own	ET
Libra EWT	Brazil	Petrobras	2200	2016	FPSO	Lease	S
Tartaruga Verde	Brazil	Petrobras	930-980	2017	FPSO	Lease	S
Park of the Sweets	Brazil	Petrobras	1900	2017	FPSO	Lease	S
Sul Parque Baleias	Brazil	Petrobras	1010	2018	FPSO	Lease	S
Oliva/Atlanta	Brazil	Queiroz Galvao	1560	2017/19	FPSO (1+1)	Lease	ET or S
Ayatsil/Tekel	Mexico	Pemex	120	2017/18	FPSO	Lease	IT
Pemex EWT	Mexico	Pemex	80-700	2016/17	FPSO	Lease	IT or DP
West Cameron LNG	USA	Delfin	<20	2017/18	FLNG	Own	TY
Main Pass LNG Hub	USA	F McMoRan	65	2017/20	FLNG	Own	ET
Lavaca Bay LNG	USA	Excelerate	<50	2018/20	FLNG	Own	J/P
Appomattox	USA	Shell	2270	2017/19	SEMI	Own	S
Mad Dog 2	USA	BP	1370	2018/19	TLP	Own	T
Leviathan Phase 1	Israel	Noble	1630	2017/19	FPSO	Lease	ET
Bream	Norway	Premier	~100	2018	FPSO (cylindrical)	Lease	S
Bressay	UK	Statoil	91	2018/19	FSO	Own	IT
P Meridian Regas	UK	Meridian	<50	2016/18	FSRU	Lease	IT
Madura BD	Indonesia	CNOOC	55	2016/17	FPSO	Lease	ET or S
Gehem/ Gendalo	Indonesia	Chevron	1550-1830	2017/18	Barge (2)	Own	S
Ubon	Thailand	Chevron	75	2018	FSO	Own	ET
Nong Yao	Thailand	Mubadala	60-75	2015	FSO	Lease	ET
Wassana	Thailand	KrisEnergy	60	2015	FSO	Lease	ET
North Malay	Malaysia	Hess	55	2016/17	FSO	Own	ET
Tembikai	Malaysia	Vestigo	50-100	2016/17	FSO	Lease	SPM

* IT = Internal turret ET = External turret S = Spread moored T = Tendons J/P = Jetty/pier moored SPM = Single pt mooring TY = Tower yoke DP = Dynamic positioning

DNV GL: Regulatory Roadmap for Floaters in the U.S.

"This roadmap removes the uncertainty factor and by including all the relevant information in a single document it is a clear path for compliance," said DNV GL's Paal Johansen, who leads the classification business in the Americas.

DNV GL has mapped out what is necessary to be in compliance with U.S. Coast Guard (USCG) requirements to operate FOIs, FSOs and FPSOs in U.S. waters. In what DNV GL is calling the first comprehensive overview of its kind , the roadmap document entitled "Verification for compliance with United States regulations on the outer continental shelf," follows from the USCG's policy letter last year, accepting approval plans and inspections from the class societies DNV GL, Lloyd's Register, and ABS as basis of USCG approval. However, differences in the accepted rules and standards, and the subsequent variety in the complementing requirements from the CFRs (Code of Federal Regulations) led to uncertainties among operators, both about requirements and final approvals. FOIs, FSOs and FPSOs in compliance with this document will be given a U.S. class notation indicating compliance with both the DNV class standards and the additional USCG requirements. This statement of compliance will meet all U.S. Coast Guard requirements.

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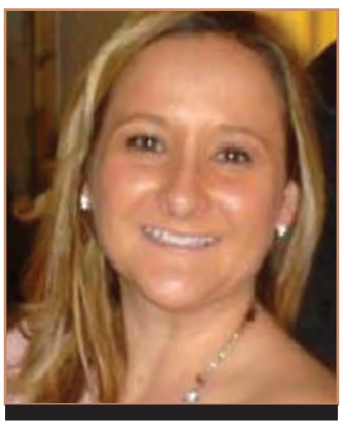
BY RICH MERHIGE



BY TERESA DRUGATZ

The Authors

Rich Merhige has over 31 years of condition monitoring experience. He founded/is President of AME, which is recognized as an external specialist for condition monitoring by ABS.
rich@AMEsolutions.com

Teresa Drugatz joined AME in 2010 as Office/Marketing Manager. She holds a bachelor of science in communication from the University of Miami.
teresa@AMEsolutions.com

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If you operate a vessel, its machinery, without a doubt, will require alignment many times during the course if its life. When misalignment is present components will be worn, efficiency will be lost, and, if left uncorrected, mechanical failures are imminent. This translates into a strain on mechanical systems, your budget, and your peace of mind.

When speaking of alignment in marine applications, it is usually shaft alignment that is being referenced. Shaft alignment is defined as the positioning of two or more machines which so that at the point of power transfer from one shaft to another, the axes of rotation of both shafts should be collinear when the machine is running under normal conditions (DB Pruftechnik, An Engineer's Guide to Shaft Alignment, Vibration Analysis & Dynamic Balancing, courtesy of LUDECA, Inc.).

The symptoms of misalignment are often noticeable, and include increased vibration, which can shorten machine life; extra load and added stress on components; and, an increase of heat output from prime movers, which draws more current. This causes increased fuel consumption, in turn, increasing carbon emissions. Misalignment in rotating machinery increases energy costs, coupling damage, and repetitive shaft seal, as well as bearing failure.

There are many causes of misalignment, and one of the most common is the aging of the engine mounts. Engine mounts have rubber elements which over time degrade and harden, causing wear and an inability to properly isolate the forces transmitted by the engine and maintain alignment during operation. Likewise, if the improper mounts were used or incorrectly installed, engine forces would again not be correctly isolated causing misalignment. If left untreated or not replaced, improper support of the engine will cause it to shift and could compromise the running gear.

"Depending on the arrangement and installation, mounts should be changed every 5-10 years since this is when the properties of rubber are most likely to degrade and begin causing problems. It's considered good practice to change main propulsion thrust bearing mounts more frequently, as the absorption of force reduces their life span," said Rich Merhige, President, Advanced Mechanical Enterprises, a mechanical engineering services firm headquartered in South Florida. "Mounts should also be kept free of any oil, as its contact with rubber will also cause premature wear."

Running aground is another frequent cause of misalignment. Even getting some line tangled in a propeller can shift the struts, causing them to move out of alignment. Other causes of misalignment include the changing of the hull shape (hull deflection), which is why pre-and post-hull deflection measurements are crucial for proper alignments. AME uses the Levalign Ultra, a self-leveling rotating laser system to conduct this procedure which is vital to successful haul-outs. Likewise, a final laser alignment check should be done oncethe vessel has been waterborne, and has had a chance to settle 24 hours. Hull deflection is often overlooked during the build process resulting in misalignment.

Misalignment, regardless of its origin, can cause rapid wear on bearings, damage shafts requiring them to be repaired, and in more extreme cases replaced. Extreme vibration can cause increased damage to engine mounts, and the reduction gears, sometimes even causing failure. Shaft sealing systems can also become damaged, and need to be replaced. When machinery is correctly aligned, a 1-3% increase in energy efficiency can be achieved.

Since misalignment is a major source of vibration, the most accurate, efficient, and economic way to diagnose misalignment is to conduct a vibration analysis. Vibration analysis can identify what mechanical issues a vessel is having and eliminates the guesswork that way too often comes into play with repair services. More specifically, it can determine exactly where misalignment is present.

"When a client first calls requesting service work, most specifically an engine alignment, the first thing my staff asks, is if they've had a vibration analysis, to verify and pinpoint the cause of the misalignment," said Merhige. "It's very easy to proceed on the presumption that the cause and location of the misalignment is known. But, without a proper diagnosis with vibration analysis, a simple service call could turn into a major ordeal when issues are continuously uncovered."

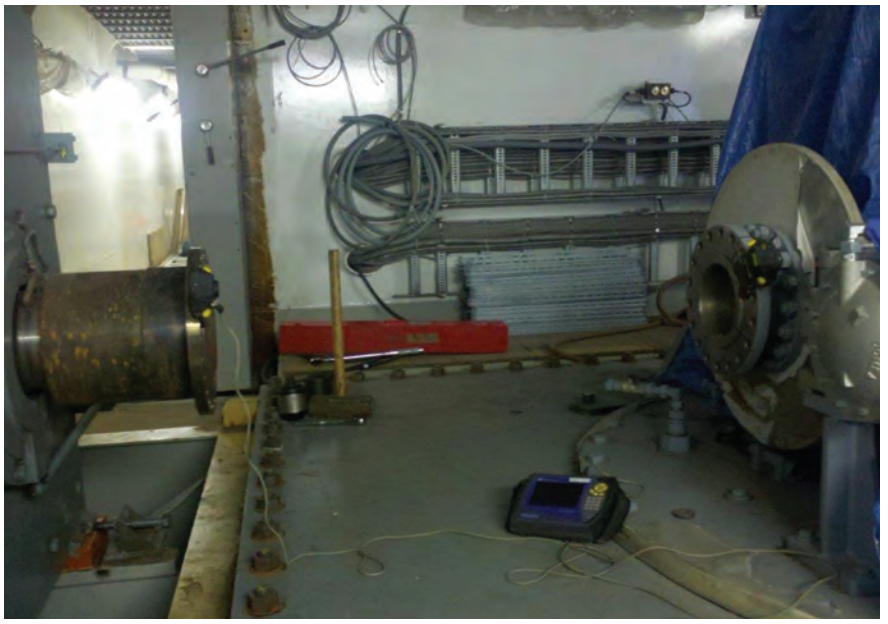
Data is collected in accordance with guidelines set forth by the Society of Naval Architects and Marine Engineers, as well as different class societies. This data provides a thorough machine condition evaluation and can detect a multitude of problems using known frequencies specific to the vessel, including, but not limited to:

- Misalignment of shaft couplings, flexible machine couplings
- Misalignment of underwater running gear such as propeller struts
- Propeller defects
- Bent shafts
- Unbalance of rotating components
- Main engine misfire problems
- Mechanical looseness
- Deterioration of rolling-element bearings within transmissions and thrust bearings
- Gear tooth wear
- Mechanical rubbing
- Structural resonance
- Machinery soft-foot conditions

Another way to diagnose misalignment is by conducting periodic alignment checks. In accordance with good marine practice, alignment should be checked six months to a year after a new installation; when experiencing a shaft seal or bearing failure or when a bearing is replaced. Once the data from a vibration analysis or laser check is analyzed a proper course of action can be implemented, which includes an alignment procedure based on the mechanical arrangement of the components involved in the misalignment, as well as the specific issue at hand.

Generally speaking, misalignments are corrected with either laser and/or optical alignments. Optical alignments are performed using optical borescopes, and must be done out of the water when the running gear has been removed. Laser alignment is the process of measuring misalignment between mechanical components, usually one or more shafts. It is a precise way to align machinery while minimizing the likelihood of human error. It utilizes laser beam transmitters and receivers to attain alignment within extremely high tolerances.

The first laser alignment systems surfaced in the early 1960's. Laser beams were applied later to alignment applications to maintain a line of sight. Prior to the use of lasers, piano wire was often used for alignment. Wire posed problems, as one could imagine. The weight of a wire can cause sagging, and even environmental factors can cause it to move, causing great inaccuracies. Since light travels in a straight line, lasers were an easy choice as a replacement for pre-



cision alignments.

Today, there are many types of laser alignment systems. PRÜFTECHNIK, a manufacturer for some of the most advanced German-engineered laser alignment systems on the market, is sold locally in the southeast by Ludeca, headquartered in Miami. Some of the most notable units include the Rotalign Ultra IS, and Levalign Expert. The Rotalign Ultra IS is an all-in-one high end alignment system that can be used for geometric applications. It can measure hundreds of positions and allows for one-step machine corrections in vertical and horizontal directions. The Levalign Expert is a self-leveling, spinning laser that measures flatness, straightness, parallelism, and perpendicularity. Both systems are utilized by AME, who works closely with Ludeca to keep up to date on training and the latest alignment applications and software updates. Relationships such as this provide for a plethora of opportunities to solve some of the world's most challenging misalignment issues, particularly in the marine market.

Most recently, AME was commissioned by one of the world's largest marine solutions, transportation and logistics company to conduct shaft alignments for newly installed generators on its three 750 Class Articulated Tug Barges (ATB). When the generators were installed, AME field service engineers were tasked with aligning the generator shafts to the PTO of the main reduction gears. First, rough alignments were done with a digital protractor being used to keep the same transversal level with the engine. Axial alignment was attained and set according to the coupling manufacturer's specifications and radial and angular alignment was set using the Rotalign Ultra. Thermal growth offset was applied to allow for thermal growth of the two units. Aluminum forms were then built for the pouring of Chockfast Epoxy Orange, which is a resin chocking system that has an excellent reputation for setting installations and maintaining alignments, particularly for marine applications. Once poured into the forms, it was left to cure for a period of 18-24 hours. AME field service engineers then conducted their final laser alignment checked, before torqueing the hold down bolts on the unit as required.

"The sensor technology of the Rotalign Ultra allowed for this particular alignment to be attained with a simultaneous horizontal and vertical move using the jacking bolts," said Daus Studenberg, Applications Engineer, Ludeca, Inc. "Most systems would have required that this move be broken down into two steps to achieve alignment, which would have utilized more man hours and end up costing the client more money."

Once the alignments were completed, vibration analysis was conducted on each of the units to confirm proper installation and alignment. Recommendations were then made for periodic alignment checks to maintain optimum performance, efficiency, and preventing premature wear of components.

"We use vibration analysis as a diagnostic tool to solve mechanical issues. Misalignment is the cause of those issues a significant amount of the time," commented Merhige. "Formal education, hands on training, and field experience, coupled with access to the most state-of-the-art alignment systems can prove to be extremely beneficial for maintenance budgets, often, with an immediate and noticeable ROI. Bottom line, an investment in alignment pays dividends when it comes to mechanical health."

Remote Diagnostics

Help to Drive Ship & Equipment Efficiency Gains

With the advent of ever faster, stronger maritime communication links and the influx of the next maritime generation, the first "internet native" generation, a proliferation of shipboard tools are under development that promise to change the very means in which floating assets are built and maintained. Imtech Marine is convinced that accelerated uptake of remote diagnostics and preventive maintenance for shipboard equipment will be built on performance gains that are straightforward and tangible.

Frank Berends heads a team at Imtech Marine typifying a fast-evolving new breed of marine engineering specialists, one whose dedication to optimizing and maintaining shipboard equipment remains unchanged, but whose presence is largely required ashore.

But Imtech is not simply in the business of providing the physical tools to accomplish the task. Realizing the vessel owner operators today are tasked with an ever evolving spiral of technical matters surrounding their fleets, they aim to assist with technical experts.

The marine technology group and global service provider is at the forefront in delivering expertise in remote performance analysis, testing, fault-finding, maintaining and optimizing the performance of shipboard equipment on which efficient operations depend.

Backed by three Global Technology Assistance Centers (GTAC) in Houston, Singapore and Rotterdam, the Imtech Marine technical team is available 24/7 to interpret monitored data, offer diagnostics support and remote maintenance. From the GTAC centers, engineers support technologies as diverse as:

- VSAT
- Integrated Bridge Systems
- Shipboard ICT/Infrastructure
- E-Systems
- Integrated Platform Management Systems
- AV/Entertainment, and
- HVAC

Nico van Leeuwen, Imtech Marine Director Global Service Sales, positions the Imtech Marine of today as a "systems integrator plus", taking a "cables to data" approach that combines expertise on shipboard systems with benchmarked performance analysis undertaken ashore. "Having and analyzing the right information through our global service database at the right time means we can make informed decisions on how, where and when to execute routine maintenance, software installations, hardware replacements or upgrades," he said.

Imtech Marine is also relaunching Radio Holland as the brand to identify its entire navigation and communications service portfolio, including remote monitoring - a move Van Leeuwen says emphasizes the "resilience of the RH brand", and its strong reputation for service.

Pictured above is Oleg Strashnov, a crane vessel on approach Rotterdam.

"With Remote Monitoring, potential problems will be signalled pro-actively and in many cases before they actually happen," said Berends. "At the same time, advice offered online can cover anything from routine maintenance to software upgrades, to operator error. If direct intervention is not required, remote support is enhanced via a Customer Portal that gives access to all technical information, such as drawings, manuals, circulars, FAQ's, Trouble-shooter, updates and software updates."

One benefit is that fault-finding can be done remotely, avoiding both the costs and inevitable time lags involved in

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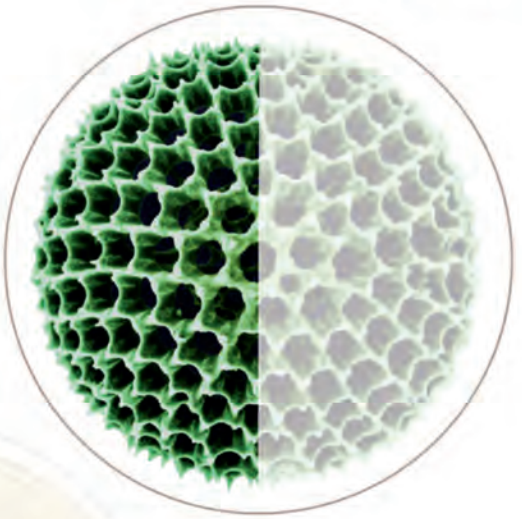

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Imtech Marine is relaunching Radio Holland as the brand to identify its entire navigation and communications service portfolio, including remote monitoring.

Nico van Leeuwen, Imtech Marine
Director Global Service Sales

Below: Main mast from helideck of Oleg Strashnov.

Inset: Fiber optic patch panel for ship-wide network distribution onboard Oleg Strashnov.

sending, lodging and briefing a field service engineer. In addition, Van Leeuwen stresses, when direct intervention is required by service engineers: "GTAC will inform the Service Coordination Center with all essential background information and full diagnostics for the attending Field Engineer. The 'First Time Fix' percentage of field service will increase, reducing repair time."

Remote monitoring is therefore a critical component that supports the optimization of ship efficiency because it enables expert advice to be given to shipboard engineers immediately on how to adjust operating processes to get the most out of working equipment, said Berends.

In fact, he describes fast-rising expectations from customers for remote monitoring, its predictive capability and its ability to identify root causes in fault-finding, while continuing to stress that the ability of Imtech Marine's GTACs to respond quickly to incoming calls for assistance remains critical.

"At one level, our most pressing calls will come from customers with a problem that needs to be dealt with immediately. However, owners are increasingly seeking preventive capability, with equipment and systems monitoring backed by expert advice to optimize asset utilization," Berends said. He describes a common scenario, where a ship's master might be tempted to reset some or all systems when suspecting impending satellite connectivity outage, when the right course of action is to identify the source of the signal compromising connectivity and isolating the issue.

"Sometimes it is a case of helping the master with the problem he has by identifying that it is not the problem he thinks he has," he said. "By monitoring equipment remotely, we can establish that the basic problem is a signal feeding into the network, not the network itself, and thus avoid time-consuming reconfiguring."

At a system-specific level, a problem caused by GPS may present itself to the user as a perceived radar problem, for example, but remote monitoring can identify the root cause and offer alerts on a proactive basis.

Keeping close oversight of shipboard equipment temperatures is also essential, Berends said. "If shipboard equipment is left to operate at too high a temperature, the first warning can be when it burns out." Imtech monitoring provides the basis for recommendations on preventive action.

"Increasingly, we are also working in close collaboration with engineers onboard ship to enhance their own working

AREA SALES MANAGER
Mr. John Adams
+1 509 637 6190
j.adams@palfinger.com
White Salmon, WA

AREA SALES MANAGER OFFSHORE
Mr. Louis Le Bourgeois
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Above Right: **GTAC at Radio Holland Netherlands in Rotterdam**, one of three locations where the VSAT network of Radio Holland is monitored and assistance to users of that network is provided. Left: **Frank Berends** says that around one half of inquiries dealt with by Imtech's Global Technology Assistance Centers from shipboard personnel are resolved by changing settings, rather than initiating maintenance.

processes, based on our performance analysis of the systems they are supporting," said Berends. "We can also establish accurately the exact moment when it becomes most effective for both Imtech and its customers to dispatch a service engineer to the vessel. We identify the point when saving costs in one area has cost implications elsewhere."

Today, Berends says that around one half of inquiries dealt with by Imtech's Global Technology Assistance Centers from shipboard personnel are resolved by changing settings, rather than initiating maintenance. "The situation reflects what landside IT users experience, and comparable troubleshooting takes place, which is particularly effective when dealing with intermittent faults."

Remote Delivery

Berends said that the economic meltdown of 2008 and lingering global economic malaise had a strong hand in slowing progress towards full condition-based monitoring, partly because owners have been unable to invest. In addition, in order to fully maximize equipment availability, optimize operating costs and minimize maintenance costs relies on collaboration involving operational-, IT- and financial managers in an integrated business case. But Berends is blunt: "It has proved a challenge to get the right stakeholders at the same table."

"Life-cycle management of vessels is surely available, but owners are skeptical about making investments based on promises that there will be savings later on. They are more receptive to straightforward propositions that are economical, rather than complex proposals whose benefits are hard to measure. Our position is that we can do pretty much anything the owner requests, but our experience is that it is better to offer gains that are simply understood and tangible."

Berends cites Imtech Marine's Advanced Support Agreement with Seaway Heavy Lifting (SHL), covering all of the systems onboard. He offers the example of the vessel Oleg Strashnov, where crew working offshore in the Indian Ocean discovered issues with the telephone system but Imtech Marine was able to carry out a remote repair. This avoided a six week application process covering service engineer permits to get onboard.

Berends said that remote monitoring of equipment is, by now, an implicit expectation when it comes to meeting the agenda set by regulators. "Regulatory compliance and environmental protection, such as the verification of CO2 emissions, rely on this type of reporting capability. Data collection is also simply the first step of the staged approach for further measures to increase ship efficiency as proposed at IMO."

However, to bring home the true potential of the remote approach, one of Imtech's recent initiatives has been to offer customers an audit after one year. He believes any owner resistance will be best addressed by offering solutions that can be proven to work every step of the way. For this reason, Imtech has broken down its remote services offer into a phased and digestible commitment for owners.

"At the new build stage, where the equipment still has to be delivered, we not only include lay-out and cabling specifications that will facilitate Remote Monitoring; we are prepared to agree a MoU that includes key performance indicators," said Berends.

"Once the capability is in place, after an agreed period, we as supplier and the end user are in a truly informed position. After 12 months, for example, we take the opportunity to sit down with our customer to evaluate and discuss the way forward, and whether their experience persuades them to include more vessels/other types of vessels in the program."

Earlier this year, Imtech put another building block in place to enhance remote capability by taking its VDR-connectivity concept live, working with Danelec to offer real time communications between ship systems and shipping offices on the safety critical information harvested from real operations.

"All VDR data from ship to shore are presented via a web interface to the customer's office, for scrutiny by superintendents and fleet managers," said Berends. "This provides an overview of navigation equipment data and performance, and the ability to check operational performance such as speed vs. fuel consumption on a random basis. Safety is also enhanced; as well as the chance to review compliance using precise data, Imtech offers an option for real time alerts on non-compliance.

"Reviewing VDR data means the service company can correct settings remotely or, optionally, the remote configuration of all automation and processing technology can be reviewed in advance of the vessel being attended by service engineers."

Van Leeuwen believes the building blocks have been put in place to overcome owner skepticism on the benefits of the remote service offer. "Identifying problems using consistent data that can be interrogated in the right way, having the right processes in place and having the right people available at our GTACs brings direct cost savings," he says. "It also ensures that when our service engineers are required to board a ship they do so fully informed and ready to act."

Five Minutes with Gulf Copper's

Dennis Buffo

Gulf Copper Vice President and USMMA grad ('71) Dennis Buffo has more than four decades of maritime experience. Here he shares 40+ years in five minutes with Maritime Reporter.

Can you tell us a bit about your background.

I graduated from the U.S. Merchant Marine Academy in 1971 and began work at Bethlehem Steel Shipyard. Over the next 44 years in the Marine business I was employed both for large vessel operators as Engineering Manager and VP, and as VP-Operations of several Shipyards in the U.S. Gulf of Mexico. I have seen both sides of the business.

Having seen your fair share of 'cycles,' describe what you've seen over the last year.

Gulf Copper dry docks have been steadily booked for the first half of the year, and the second half of 2014 looks to be just as busy. Our Port Arthur activity has been driven by the Offshore Business with supply vessels , seismic vessels and integrated tug/barge work. In Galveston we have seen several large drilling rig jobs along with a fast paced five vessel conversion project. Interest in offshore development and an expanded market in Mexico seem to be the primary drivers, along with increased transportation of petroleum cargos. Work for government agencies seems to be on the uptick as the effects of sequestration abate.

When you look at the expanse of your operations, what do you count as the primary strength of your company?

We have a consistent work force and management team. Many our skilled workers and front line supervisors have been working with our management group for over 20 years.

How is Gulf Copper investing today, in training and in people?

Safety and Loss Control remain high priorities. The training in this area is constant. We have also developed a training program for our Outside Machinist department where we have a strong demand. Development of welders is always critical, and we were recognized recently for sending our welding instructor to Guam for an apprenticeship program.

Looking at the market overall, where do you see the best opportunity for growth?

We feel the offshore market will stay strong, especially given the substantial number of large support vessels being delivered in the near term. Seismic vessel work has increased for us and looks promising in the near future. The Offshore Tug/Barge business could continue to grow as the production of oil continues on shore in Texas.

What have been a few of you most interesting projects in the last 12 months?

Three unique projects that come to mind were a conversion of an older offshore supply vessel to a Saturation Diving vessel, a conversion of a 430 ft. MPSV to a flotel and the conversion of five platform supply vessels to the geophysical trade in a 60 day period.

BAE Systems Ship Repair

Leveraging Location, Infrastructure & Workforce

By Edward Lundquist

BAE Systems launches the first of four platform supply vessels it's building for Jackson Offshore Operators, LLC., January 29, 2014. The vessels, being built in Jacksonville, Fla., will support drilling operations in the Gulf of Mexico and reflects the company's continued growth in U.S. commercial shipbuilding and its support to the offshore oil and gas industry.

BAE Systems Ship Repair is one of the many entities that make up BAE Systems U.S. subsidiary. Although BAE Systems Ship Repair devotes much of its production capability to naval customers, it also has a robust commercial business, according to Richard McCreary, vice president of Commercial Business Development.

In addition to maintenance, repair, overhaul and conversion (MROC) work, McCreary says the company is also heavily involved in new construction projects. "We have four major new construction programs underway—two in Jacksonville and two in Mobile. At our Jacksonville Yard, we are constructing four platform support vessels (PSVs) for Jackson Offshore, as well as a tug for SEACOR. At Mobile, we have two PSVs building for GulfMark Offshore, and a subsea construction support vessel for Oceaneering International.

The Jacksonville and Mobile yards are well situated to support the "oil patch" business in the Gulf of Mexico as well as construction and repair of ships involved in the Jones Act trade, he says. All of the work was competitively bid and were awarded as firm-fixed price contracts. McCreary says BAE Systems is uniquely situated with capacity and capability to handle larger value programs. "There are a couple of competitors that can do the same kind of work. However, BAE Systems' reputation and financial security are major differentiators, and big factors in the company winning the work."

McCreary says the company is "blessed in our locations."

While there are some channel restrictions, the Mobile facility has a 46,000 ton dry dock. "We can handle larger work, up to drill ships, that most of our competition cannot."

When the eastern part of the Gulf of Mexico is opened for drilling in around 2018-2020, McCreary says BAE Systems will be well situated for new work.

At Jacksonville, McCreary says the yard has an eclectic mix of business, from Navy surface combatant overhauls in the drydock to mega-yachts. "The commercial new construction is a nice balance to our Navy work."

Both Mobile and Jacksonville are doing MROC work for commercial customers, he says.

The two drydocks in Mobile and one in Jacksonville, and the ability to take larger vessels, are significant assets.

McCreary says the company is in constant contact with its customer base in the major oil and gas centers of Houston and New Orleans, and elsewhere on the east coast. While the company has long term relationships, most customers do not make long-term contractual commitments. "We're only as good as our last job, and we have to be very competitive to win the next one."

Growing Talent

The size and stability of BAE Systems has also attracted a quality workforce. "We have as skilled a work force as anyone in this industry," McCreary

says. “But we’re continually looking for skilled people.”

McCreary says there is stiff competition for welders all along the Gulf Coast. “The average age of a welder is 55 years old. They are extremely hard to find. We have to grow our own,” McCreary says.

“It’s important to maintain consistent work load to be able continue to employ same group of people, so you don’t have those gaps, or devote time a resources to training replacements,” he says.

BAE Systems is proud of its training programs, and is committed to giving its workers new and better skills and certifications. But, McCreary says, sometime jobs must be segmented where someone is trained for a specific task only. “It’s not the most efficient cover, but it can help cover the skill gaps.

But he says, the two yards enjoy significant advantages because of the parent company’s stability and the continued investment into capability and capacity. “Mobile and Jacksonville are two of the best capitalized second-tier yards in the country.”

BAE Systems also does commercial work in San Francisco, as well as Navy repair and modernization in Norfolk, Mayport, San Diego and Pearl Harbor.

While the yards are busy, McCreary says the company is “actively engaged in extending our backlog. We’re diversifying our portfolio.”

BAE Systems Ship Repair

Norfolk

Employees:	2,200
Dry Docks (2):	52,500-ton & 14,000-ton
Piers:	Four
Cranes:	16
Acres:	109

San Diego

Employees:	1,750
Dry Dock:	26,000-ton
Piers:	Four
Cranes:	24
Acres:	20

Mayport

Employees:	250
Cranes:	Three
Acres:	2.5

Hawaii

Employees:	250
Graving Dock	
Piers:	Three
Cranes:	Access to shipyard cranes
Acres:	2.5

Jacksonvill

Employees:	550
Dry Dock:	13,500-ton
Piers/Wharf:	Three/One
Cranes:	42

Mobile

Employees:	900
Dry Docks (2):	46,400-ton & 12,000-ton
Piers:	Four
Cranes:	61

San Francisco

Employees:	250
Dry Docks (2):	54,800-ton & 14,500-ton
Piers:	Two
Cranes:	9

Mackinaw is a 240-ft. heavy icebreaker.

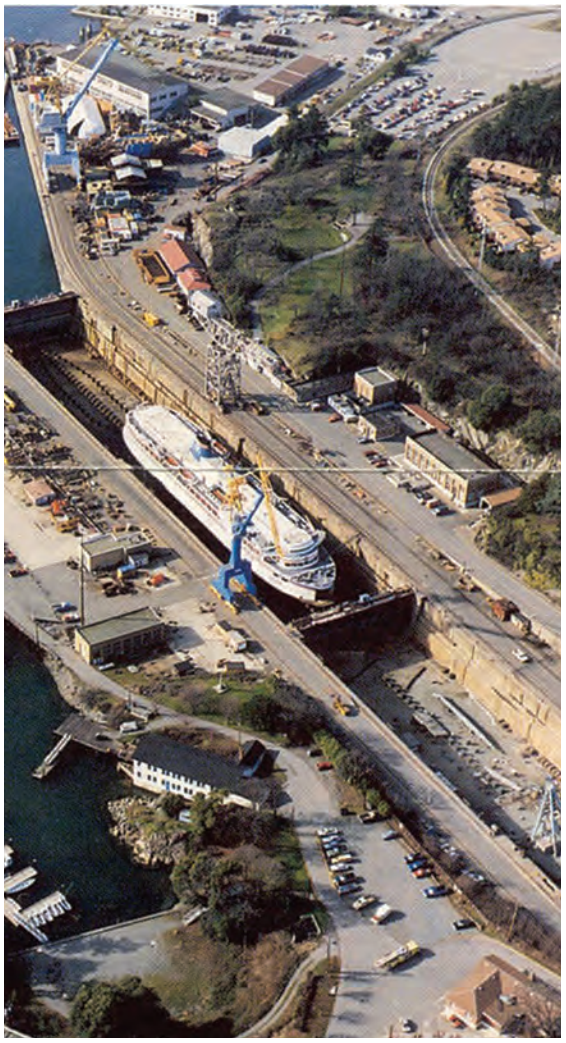
Bay Shipbuilding Wins USCG Repair Contracts

Fincantieri Marine Group (FMG) subsidiary, Bay Shipbuilding Company (BSC) of Sturgeon Bay, Wis., won a USCG contract for drydock repairs to the United States Coast Guard Cutter Hollyhock (WLB-21) and a second USCG repair and sustainment contract for the icebreaker Mackinaw (WLBB-30).

Hollyhock is a Juniper Class Seagoing Buoy Tender measuring 225-ft. long. Mackinaw is a 240-ft. heavy icebreaker for operations on the Great Lakes. Both ships were built by FMG subsidiary, Marinette Marine Corporation (MMC), and launched in January 2003 and November 2005 respectively. Hollyhock's primary missions are maintenance of aids-to-navigation, as well as search and rescue, environmental protection and ice breaking. Mackinaw is primarily engaged in keeping the sea-lanes clear of ice although it also serves as an aids-to-navigation ship.

"Fincantieri's recent capital investment in BSC, included the construction of a United States Navy-certified floating drydock, will be instrumental to the repairs," said FMG President and CEO Francesco Valente.

In May of 2014, Sturgeon Bay was officially designated "A Coast Guard City." Sturgeon Bay, which has a 140-year relationship with the Coast Guard and its predecessor services, is now one of 16 cities designated by Congress with that distinction for support shown to the men and women of the Coast Guard.



Dry Dock Conference 2014

Scheduled for December 1-2, 2014 in New Orleans

Dry Dock Conference 2014 is the eighth in a series of international Conferences held every two to three years. This year's conference will be held December 1-2, 2014 in New Orleans. Among the highlights of the upcoming New Orleans' conference will be a series of presentations from experts on unique drydockings, heavy lift difficulties and ship launching challenges.

The goal of the conference is to educate and provide technological updates to personnel in the dry dock industry. The papers and presentations promise to cover a broad spectrum of topics dealing with a multitude of issues facing the dry dock community. Professionals from around the globe will share their endeavors in planning, financing, permitting, designing, constructing, operating, and maintaining dry dock facilities. Conference attendees should leave with a greater understanding of the challenges faced by the industry, as well as insight into how to overcome them.

The conference provides a venue to learn about new products and services, and generate contacts. Topics for this year's conference include:

- damaged ship dry docking
- dry dock failure analysis
- dry dock maintenance issues
- economic aspects of drydocking
- establishing a dry dock standard
- graving dock repairs/upgrades
- heavy lift operations
- travel lifts
- unique drydockings
- vertical lifts
- vessel launchings
- vessel transfer operations

The conference is recognized as an outstanding opportunity to network with the hundreds of practitioners, researchers, and specialists at the leading edge of the dry dock industry. Drydocking has long been a small but vital part of the ship building and repair industry and the current global economic climate puts an added premium on dry docking crews to boost their efficiency. With larger and more complex ships creating new dry docking challenges, this upcoming conference is a great chance for those the maritime industry to gain new insights into this ever changing field. Attend Dry Dock Conference 2014 to prepare yourself and your teams to compete in this vital aspect of the shipbuilding and repair industry.

www.drydocktraining.com

Underwater Repairs for Mammoth Containership

At the end of June, a Hydrex team replaced the three leaking bow thruster shaft seals of a 400-m container ship in Gdansk, Poland. The operation was performed on-site and underwater using the company's flexible mobdocks. The vessel was able to continue its commercial activities without any delay.

Together with all the necessary equipment, the diver/technicians mobilized from the Hydrex center in Antwerp to the vessel's location. After they set up a monitoring station on the quay, the divers started the operation by removing the rope guard covering the thruster seals. They could then perform a detailed inspection of the seal assembly and make a good assessment of the damage.

The Hydrex flexible mobdocks were installed at both ends of the thruster tunnel. Next the team evacuated all water from the tunnel. In this manner a working environment with drydock-like conditions was created. This is essential for any permanent seal replacement. The divers removed the first seal and replaced it with a new one which was then bonded. This procedure was repeated with the other two damaged seals. All seals showed cuts at the underside.

The operation ended with succesful leakage tests, the reinstallation of the rope guard and the removal of the flexible mobdocks. During the operation representatives of both the manufacturer of the shaft seals and the bow thruster OEM were present. Ultra large container vessels like this 400-meter one have a corresponding large thruster tunnel. This was however no problem because the Hydrex flexible mobdocks can be easily adapted to the circumstance. They can be used for a wide range of repair or maintenance work on all types and sizes of thrusters and vessels.

www.hydrex.be

Hydrex making preparations for operation on 400-meter container vessel.

Diver/technician working on the shaft seal assembly.

ER Schiffahrt

Making the Connection

Fleet-wide roll-out of iW services from Inmarsat Maritime represents the latest outward demonstration by E.R. Schiffahrt of ship-to-shore connectivity. ERS Nautical Director Christoph Werner describes an owner communications strategy balancing the technically possible with the financially reasonable.

With a fleet of more than 100 ships under its control, daily communications ship-to-shore have an impact on nearly all departments for E.R. Schiffahrt (ERS). Given that the German company is a large scale charter owner and ship manager, ERS requires communications tools distinguished by flexibility.

In fact, according to ERS Nautical Director Christoph Werner, ever since the advent of satellite communications, the group has been "trying to keep the right balance between what is technically possible and what is really reasonable. So we always have to consider both our own demands to communicate with our ships and the demands of our customers regarding connectivity."

Over the last decade, Werner and the industry as a whole has stood witness to a dramatic and thorough transformation in connectivity from ship to shore. Starting from a mix of plain text/fax messaging and "seldom and expensive phone calls," services have developed to take in full exchange of e-mails with or without attachments and frequent phone conversations, and pushed on to recent demand for internet connectivity.

"In equal parts the driver is crew welfare and ship´s business," said Werner. "Both sides benefit enormously. Our crew will be able to use the internet not only in port or along the coast but also at open sea. From the business point of view, there is an increasing demand for a permanent and stable connectivity between the shore side (owner / operator / manager and charterer) and the vessel in order to exchange an increasing number of all kinds of data."

ERS is in the process of changing its entire fleet from dial up connections using Inmarsat Maritime's SAT-B and Fleet 77, to Fleet BroadBand also from Inmarsat. The upgrade - to Inmarsat's i250 offer - builds on 2011 commitment by ERS to iFUSION as its enabling platform covering communications for 87 ships. Under the new arrangement ERS will be able to take advantage of iW, a pre-paid web-browser service available to crew members.

The upgrade also includes a switch to iFUSION 2GB price plans. According to Werner, the move has been initiated to improve overall connectivity, enhance crew welfare and optimize communication costs.

"We undertook several surveys to establish how best to achieve a solution that is both technically well-advanced and cost efficient," says Werner. "Ultimately, we decided to upgrade the i250 by adding the iW solution to cope with the increasing demand for connectivity between ship and shore in all respects. The requirement was that the solution had to be cost effective but demonstrate that it could extend data collection, increase general communications and im-

"ERS is one of the leading companies worldwide in monitoring the vessel´s efficiency and performance but also in connecting other relevant systems like maintenance, warehouse- and reporting tools permanently between the office and a ship... **Without going into detail we are, for example, able to permanently and accurately monitor all engine and nautical parameters."**

Christoph Werner, Nautical Director, E.R. SCHIFFAHRT GmbH & Cie. KG

E.R. SCHIFFAHRT

Staying Connected ...

"We expect that the demand for such connectivity will increase on both sides in the near future

... while crew members want a higher bandwidth to use modern communication software or for downloading videos, the same might be expected from the business side to allow a very close connection between vessel and office."

Christoph Werner, Nautical Director, E.R. SCHIFFAHRT GmbH & Cie. KG

(Photo: Christian Schmid)

(Photo: Christian Schmid)

prove crew welfare by offering pre-paid web browsing, as well as fulfilling national and international requirements."

In 2011, ERS commented that its commitment to iFUSION was based on plans to improve its ability to support shipboard IT systems remotely, and to lower costs as traffic increased. When the commitment was made, a premium was placed on ease of use and ease of maintenance. Fast forward three years and Werner said that, in general, the expectations prompting the decision to install the iFUSION solution on board ERS vessels have been met.

"From our point of view our present satellite communication setup concept is the best solution with regards to our own demands, the demands of our clients, but also in respect of crew welfare and external requirements (port authorities, agents, etc.). We need a worldwide and reliable satellite coverage for all of our vessels. Our IT Support Fleet team was involved in the iFUSION project right from the start. We defined our requirements and then looked at the alternatives," said Werner. "iFUSION turned out to be the best solution in terms of performance versus cost for us. Since there is no external third party hardware (such as a firewall) to be connected, installation and equipment support of the equipment is straightforward."

Werner does not downplay the practical challenges that popped up along the way. "It took considerable effort to select the right hardware (both above and below deck) before we started to put that equipment on board. We did that with the clear intention of minimizing the time needed for trouble shooting and replacement. But, we have been able to lower our communication expenses by approximately 50% and increase the data volume being transferred at the same time. Our IT Support Fleet staff is able to connect to the vessels for trouble shooting on the IT network."

A Look Ahead

With the new iW capability going live, Werner said that technological possibilities have not been the sole factors determining connectivity choices over the last decade. In that time, shipping has been exposed to turbulent market conditions, for example, while the connectivity needs for different sectors have matured in different ways, he says.

"Each type of shipping company, from their different points of view, tries to find the best balance between costs and benefits, and the needs of a container ship operator are not the same as those of an offshore vessel owner, for example. It is also fair to say that there has been a common skepticism amongst ship owners and managers, at least in Germany, on the adoption of new technologies, and that has included FleetBroadband."

However, Werner said that outlay on connectivity has amounted to around one per cent of the owner's operational expenses, anticipating a increase in the period ahead to "possibly" 1.5-2%. By contrast, he suggests the potential for operational returns are significant. "Collecting and analyzing vessel performance data is an essential part of the E.R. Schiffahrt strategy to maintain and extend its leading position as a ship owner and manager operating each ship in the most efficient way. We expect that we will need a higher data speed and more data volume in the near future," he said. Indeed, such is the priority placed by ERS on the data its ships generate: "Data storage is still under discussion but it looks like that we will adopt an in-house data warehouse solution rather to keep them with a service provider."

Today the company is even considering whether connectivity should be considered at the newbuild stage. While it has no solid plans "we will definitely include the pre-installation of sensors, cabling, access points etc. in a planning of a future newbuilding project," Werner said.

"ERS is one of the leading companies worldwide in monitoring the vessel´s efficiency and performance but also in connecting other relevant systems like maintenance, warehouse- and reporting tools permanently between the office and a ship," said Werner. "Most of the tools are tailor-made solutions which suit our needs and those of our customers. Without going into detail we are, for example, able to permanently and accurately monitor all engine and nautical parameters."

Also in the future, is the potential offered by Inmarsat's new generation satellites, and specifically availability of faster data transfer promised after the launch of Inmarsat Maritime's Global Xpress service in early 2015. "Global Xpress might be one of the solutions to cover the future needs for connectivity, because they will require permanent connection with a sufficient speed and bandwidth," said Werner. "The expectations from the crew side definitely cover areas which are presently restricted for internet use on board - Skype, Youtube and video streaming in general."

(Photo: Christian Schmid)

What is Inmarsat iFUSION

Inmarsat iFUSION offers access to an advanced maritime communications management solution. The complete iFUSION vessel communications management system comprises:

- FleetBroadband 250 or 500 terminal
- Satellite gateway
- Network router
- Integrated ship and shore firewall
- Web and IP acceleration
- Voice and GSM network, and
- Crew services.

Inmarsat iFUSION provides shipping companies and operators with the ability to configure and control all onboard voice and data satellite communications from shore using the online Inmarsat iPORTAL.

iFUSION can also act as a least cost routing gateway to other available IP communication systems, including VSAT and Wi-Fi.

The integral iMOBILE system is an optional add-on service and delivers an affordable GSM voice and SMS messaging service, with traffic routed over FleetBroadband or IP networks, allowing crew to use their own mobile phones simply by inserting an Inmarsat SIM card.

iFUSION also incorporates iVOICE for prepaid and post-paid fixed line calls. It supports up to nine handsets, allowing a total of five simultaneous inbound-outbound calls, while keeping a direct line free for the ship's master at all times. Local in-country numbers can be assigned to each phone line to reduce the cost of calling the ship.

German Shipbuilding

Growing order income with new advanced product solutions

By Peter Pospiech, Dipl.-Ing.

The German shipbuilding industry has a world market share of around one percent. This is certainly in another league compared to China, South Korea and Japan, which divide the global shipbuilding pie of containerships, bulk carriers and tankers among themselves. But the German shipyards are on top in Europe.

Here, around 90,000 people in the shipbuilding and supply industry are employed, and the German maritime cluster remains in strategic and symbolic importance. Aside from the Norwegians, which maintain a strong presence in the offshore segment, the Germans companies are in a worldwide leading position.

Recent news about the German shipbuilding has not been the best. But the takeover in early February 2014 of Sietas-Werft – which is based in Hamburg and was traditionally rich, but now insolvent – by Pella Shipyard closes one door, but opens new perspectives for remaining employees. And the future of the P+S-Werft in Wolgast and Stralsund remains unclear.

A year and a half after its insolvency, the last newbuild left the assembly hall of the Volkswerft in Stralsund, a RoRo ship for the Danish shipping company DFDS.

For this shipyard and for the entire German shipbuilding industry, the prospects of building high-value, specialty ships today holds the most promise for future business.

"The German shipbuilding can score points with all what is complex, where customers have high requirements and where they are willing to pay a higher price because they depend on that everything works well," said Reinhard Lüken, General Managing Director of Verband für Schiffbau und Meerestechnik e.V. (VSM).

The Global Shipbuilding Perks Up

German shipyards are essentially holding steady, with the turnover of all German shipyards at the end of the third quarter 2013 being $4.6B, which is slightly under the $5.3 billion recorded at the end of Q3 2012. Despite this drop off, VSM is taking a positive view, as it sees slightly increasing demand worldwide, as well as a growing population and the increasing claims of affluence. In addition, German companies as a whole

Previous page, clockwise starting at the top:

- **Meyer Shipyard and it's daughter company Neptun Shipyard, Rostock, have had again a successful year. In 2013 two cruise ships, one LNG-gas tanker out of Papenburg and 10 river cruise ships out of Rostock ensured employment.**
- **Blohm+Voss latest super yacht Graceful**
- **The "Aeolus", the first in Germany designed and build Jack-up vessel for the offshore industry, which has been built at Sietas Yard for well-known Dutch hydraulic engineering company Van Oord, left the Sietas Yard in February 2014.**

"The German shipbuilding can score points with all what is complex, where customers have high requirements and where they are willing to pay a higher price because they depend on that everything works well."

Reinhard Lüken, GM Director, VSM

TKMS supplied the corvette Oldenburg for the German Navy

Lloyd Werft in Bremerhaven had full docks earlier in the year.

"The supply industry engage in Germany around 68,000 employees with an annual turnover of around $16B. In the global comparison this type of trade ranks furthermore at number one position."

Hauke Schlegel, General Manager, VDMA

have found growth for efficient and environmentally friendly technologies.

A spate of recent impressive contracts include seven vessels valued at about $1.4B. This line-up includes a cruise ship, a yacht, a pipe-laying ship, a coastal patrol boat as well as three rescue cruisers. In addition there is a further (and so far biggest) platform for the offshore wind industry. With this the total order income of all German shipyards includes a volume of more than $11.9B.

Specialists Needed

A good example of progressive companies making their way in a tight environment are Meyer Werft in Papenburg and its daughter company Neptun in Rostock-Warnemünde. In 2013 two cruise ships, one LNG-gas tanker out of Papenburg and 10 river cruise ships out of Rostock ensured employment.

"With the engagement of our employees it was ensured that the ships could be on time and succesfully delivered. This particular motivation is what we will need also in the coming years," said Bernard Meyer, General Manager. But difficulties still remain, and recently even the experts of Meyer Werft couldn't secure an order for two AIDA newbuilds against Japan's Mitsubishi.

In total, seven cruise ships, 29 river cruise ships and one research vessel will be planned, designed and built from Meyer Werft.

With these order books and the consequent implementation of the company's efficiency strategy (SSS = System Schlanker Schiffbau = system lean shipbuilding) Meyer sees opportunities for both yards: "big chances in the hotly-contested global shipbuilding market to survive."

Also the focus of the Flensburger Schiffbau Gesellschaft (FSG) is clear: "Our future is clearly the special shipbuilding segment," said FSG-Chief Peter Sierk. In 2013 the shipyard delivered four RoRo-special ships to owners Ulusoy Sealines, UN Ro-Ro Isletmeleri S.A., Canadian Shipping Company Oceanex and RollDock B.V. in Holland, the "Rolldock Star."

FSG made a name for itself over the past 15 years as a leader in the building of RoRo and RoPax ships, and entered the Offshore market with two orders for Dutch operator RollDock as well as two new orders for seismic vessels for WesternGeco. For the Flensburg-based yard, this is another successful step in the expansion of its production portfolio. "We have been working in the Offshore sector for some years now and this order of complex products proves that we have established our position in this high-tech market," said Sierk.

The two seismic vessels will be owned by Siem Offshore and chartered by the worldwide leading Offshore service provider Helix Energy Solutions Group, Inc.

Maritime Know-How

TKMS profiles as Europe's leading system supplier for navy ships: in 2013 three corvettes have been delivered and the order books feature among others submarine boats for Singapore.

Companies such as Bremen Lürssen Werft are equipped with unique know-how during construction of luxury yachts. Just recently the shipbuilder of Bremen signed a contract for ships for the Saudi Arabian Coast Guard. "Production probably will take place on the Peene-Wefrt in Wolgast,"said a company spokesperson. Order volume and the number of ships were not confirmed, but according to media reports the amount is of $1.4B.

At the end of 2012 Lürssen purchased a shipyard for $23.5 million in what was the former East Germany, a yard which was reportedly the biggest military yard in the ex-DDR.

Meanwhile, life boat experts at Fassmer delivered last year, among others, one survey vessel, one rescue cruiser, a number of work boats and one research vessel. Last October Fassmer landed a deal for the construction of an innovative ferry boat from shipping company Cas-

sen Eils, Cuxhaven, a ferry to navigate in the Helgoland-Service. This is significant in that it is the first newbuild under German flag equipped with environmentally friendly LNG technology.

Another innovation emanating from Germany comes in the form of Aeolus, which was delivered in February 2014 and was a premiere in German shipbuilding as it was the first Jack-Up designed and built in Germany. It was constructed at the Sietas Yard for Dutch hydraulic engineering company Van Oord.

In Bremerhaven, Lloyd Werft cannot complain about a lack of work. "We realize an intensive demand about our skills in the special ship building process, but remain also first port of call for repairs and modifications for cruise ships," said Rüdiger Pallentin, CEO, Lloyd Werft. After the cruise ships "Explorer" and "Mein Schiff1" were delivered in April and May last year, respectively, the yard signed during the International Cruise Shipping in Miami a contract for the repair of the U.S. cruise ship "National Geographic Explorer" (112 m long, 6,471 BRT) with its owner U.S. shipping company Lindblad Expedition Inc.

Strong Export Share

The combined turnover of all ship and boat building yards (including navy shipbuilding, repairs, modifications, inland shipping, etc.) are for the first three quarters, according to information from the Federal Statistical Office, in total $4.6 billion, slightly less than the comparable period in 2012 which was $5.3 billion. In total, approximately 98 percent of the civil ship building output are for export, which is similar to the last few years.

Export is traditionally also important for the shipbuilding supply industry. VDMA, the German Engineering Federation, reports that around 400 supply companies feature an average export rate of 74 percent. They benefit substantially from the increase of the worldwide shipbuilding demand and particularly of the increasing energy efficiency, which is a particular strength of the German manufacturer.

In Germany the ship building supply industry employs about 68,000 with an annual turnover of around $16B.

After the historic shipbuilding run and its abrupt end due to the global financial crisis, the ship supply picture has morphed, and today about 40% of the companies experienced growth in 2012, while about 33% reported a decline in sales. VDMA economic data delivered for 2013 again paints a positive picture for the entire maritime supply branch. The increase of the order incomes continued in 2012 at about four percent, a growth rate confirmed in 2013, too. By sector, the offshore market continues to grow in importance in Germany, and it will be an important task for German companies to strengthen their presence in this market to increase overall sales growth. While the shipbuilding industry has certainly changed mightily in Germany – and in fact worldwide – it is clear that shipbuilding and ocean engineering are industries with big growth opportunities. As the world's population continues to grow, so too will the requirement for food, commodities and energy, all of which travel liberally on the seas.

Germany has the best conditions in these markets to play an important role – because solutions for these highly ambitious challenges can only be created with the best engineering activities. Also in these difficult times a particular focus is on education at all levels, another strength of Germany and the technical markets it serves.

ZF Marine makes a strong Towboat Thrust

By Greg Trauthwein

When German industrial manufacturing giant ZF bought Holland Rudder Propeller nearly five years ago, it was a strategic addition to its ZF Marine portfolio that is now reaping big rewards as it is enjoying strong penetration of its azimuth thruster systems in the U.S. towboat market. Maritime Reporter & Engineering News visited with Frank van der Vegt, Sales Manager, Commercial Craft Thruster Systems, at the ZF Marine Krimpen B.V. factory in The Netherlands for an update.

The marine business, particularly the inland marine business here and abroad, is generally conservative in its uptake of new technologies, particularly when it comes to the vessel's power system. Simply put, there is still a proliferation of smaller, tightly held companies that have been managed and operated for multiple generations, with the preference to lean on accrued experience.

But the market is changing, driven by larger corporate entities nudging their way into these tightly held markets, and also by a myriad of legislative and operational conditions – namely the rapidly rising cost of fuel. ZF Marine – or more specifically ZF Marine Krimpen b.v., the commercial thruster manufacturer – is poised to profit as it builds an enviable reference list of inland towboat companies enjoying operational advantages and tremendous fuel savings courtesy of its thruster solution.

2009: A Pivotal Year

ZF bought HRP Thruster Systems B.V. in 2009, a strategic purchase that proved to be the proverbial 'win-win' for both companies. HRP was at a crossroads, faced with investing heavily in infrastructure and people to grow its organization to a level where it was capable to serve clients globally, or linking up with an organization with a global network in place.

ZF turned out to be a perfect partner.

ZF Group, an industrial behemoth with $22.4 billion in sales and 72,643 employees at the end of 2013, was looking to add marine thruster technology to its ZF Marine family of products, and it already had the established network of sales and service in place, as well as the engineering horsepower and organizational structure to grow the thruster business quickly and effectively.

"Essentially, we went from a small company to a big company, and the way in which we view

ZF Group By the Numbers

When ZF touts its global capability, it 'walks the walk' with the numbers to back it up. Some impressive end of 2013 numbers include:

Sales	$22.4 billion
Employees	72,643
R&D Expenditure	$1.1 billion

- 122 production companies in 26 countries
- 8 main development locations in 4 countries
- 33 service companies
- 724 patent applications in 2013 (Top 10 in patent applicants in Germany)

and approach the market is significantly different," said Frank van der Vegt, Sales Manager, Commercial Craft Thruster Systems, ZF Marine Krimpen B.V. "For example, we could have never pulled off what we did in the Americas market – the penetration of the inland tow boat market – as a small company."

"The way it is taking off now means that you need a lot of focus, a lot of attention and a lot of people on site. So we used the strength of the ZF organization, in this case in America, to give this focus and to bring this to the next level."

What the company has pulled off is a penetration and rapid growth in the inland towboat sector, a conservative niche that traditionally had not embraced azimuth thruster technology. Aside from the fact that it's "new," a primary stumbling block was the concern of potential damage to the units on the shallow draft and ever changing inland waterway system.

Key to opening any market in any industry is finding a willing, stable partner, which is exactly what ZF Marine found in the Southern Towing Company, headquartered in Memphis, Tenn. (See related story, page 64). Southern Towing is an innovator in the name of environmental excellence and operational efficiency, and starting in 2008 it started outfitting a number of its new build towboats with the innovative rudder propellers.

"It's very much an industry where everyone waits for the first guy to do it and everyone watches," said van der Vegt. "And I think you're seeing that on the inland waterway market with some of the big companies that can absorb a first vessel project like this to test the technology. These big companies build one or two boats and get them in revenue service and compare them apples to apples. The smaller companies really watch for the results."

According to van der Vegt, the results in the case of Southern Towing are nothing short of amazing, as the company reported a nearly 30% savings in fuel costs. "When you look at the fuel savings, it's always difficult to give exact numbers because it is so dependent on how you are using the equipment. The savings is highly dependent on the vessel, route and operator, but I think that at least a 20% fuel savings for this type of push boat application is a safe number to mention."

"This is America, so it's big and the industry is big. There the potential is enormous," said van der Vegt in summarizing the U.S. market.

Opportunities Abound

While the U.S. inland towboat market is large and promising, it certainly is not the only market in play for this propulsion tech.

"The advantage in push boat performance is you have cleaner thrust coming through the kort nozzles, so there is not a parasitic loss of the propulsion power that you have in a traditional vessel," said van der Vegt.

"So you get more pure directional thrust pushing, pulling and turning the tow. You can get equivalent performance in a smaller power output, and so we are seeing with the tug fleets they are able to use smaller engines, meaning they are lighter, and with less weight penalty they are more fuel efficient."

"A 1,400 hp pushboat (with the Z-Drive) can perform the same as a conventionally outfitted boat with 2,000 hp– same barges, same loads – as each thruster has full power at 360 degrees. With traditional systems you only have full power in one direction."

(Continued on page 65)

Southern Towing: Z-Drive Pioneer

Southern Towing Company, headquartered in Memphis, Tenn., is one of the nation's largest transporters of fertilizer and other products along the nation's inland waterways. For more than 50 years, it has operated the largest fleet of anhydrous ammonia barges in the U.S. As ZF Marine will attest, the company prides itself on building and running a cutting edge fleet, including its fuel efficient and environmentally friendly Z-Drive tug boats.

While it certainly was not the first to ever install Z-Drives on towing vessels, it was an early and fervent supporter of the technology. "What you need is someone who is a believer and is willing to take the risk," said Frank van der Vegt, Sales Manager, Commercial Craft Thruster Systems, ZF Marine Krimpen B.V. "Our believer was Southern Towing Company."

"It's very much an industry where everyone waits for the first guy to do it, and everyone watches. And I think you're seeing that on the inland waterway market with some of the big companies that can absorb a first vessel project like this to test the technology. These big companies build one or two boats and get them in revenue service and compare them apples to apples. The smaller companies really watch for the results."

Beginning in 2008, Southern Towing unveiled four new Z-Drive boats that were to deliver unrivaled maneuverability on challenging inland waterways, as well as fuel efficiency in the face of rapidly rising fuel costs. Southern Towing vessels with ZF Marine Z-Drives include the vessels listed to the right:

M/V Frank T. Stegbauer
Built: 2008
Length: 120 ft.
Z-Drive: 6111 Model ZF
Horsepower: 3200

M/V David Stegbauer
Built: 2008
Length: 120ft
Z-Drive: 6111 Model ZF
Horsepower: 3200

M/V Scott Stegbauer
Built: 2009
Length: 120 ft.
Z-Drive: 6111 Model ZF
Horsepower: 3200

M/V Arne Christiansen
Built: 2009
Length: 120 ft.
Z-Drive: 6111 Model ZF
Horsepower: 3200

M/V Capt. H R Kirtley
Built: 2013
Length: 120ft.
Z-Drive: 6111 Model ZF
Horsepower: 3200

M/V Capt. Tommy Parish
Built: 2013
Length: 120 ft.
Z-Drive: 6111 Model ZF
Horsepower: 3200

"Essentially, we went from a small company to a big company ... For example, **we could have never pulled off what we did in the Americas market** – the penetration of the inland tow boat market – as a small company."

Frank van der Vegt
Sales Manager, Commercial Craft Thruster Systems
ZF Marine Krimpen B.V., explaining the impact of the company being purchased by ZF in 2009.

(Continued from page 63)

While the U.S. market is large, well-established and still in its infancy in adopting Z-Drives, there are many emerging markets with mammoth river systems, namely South America and the Amazon River system, that present good opportunity as well.

"We see the demand increasing for deck mounted units in the Amazon, as well as some of the big river systems in Africa that are growing along with the oil business," said van der Vegt. He explained that the rudder propeller solution, particularly the deck-mounted version, is particularly attractive in remote areas where there are a dearth of marine facilities or infrastructure, as the deck-mounted unites are easy to maintain and replace without the need of a shipyard. In addition, many emerging markets want to build the boats locally to feed the local market, and with the deck-mounted solution the countries can build their barges locally than easily add the propulsion solution."

While azimuth thruster technology comes with a number of advantages, the main reservation has been that the Z-Drive – which hangs below the vessel – is more vulnerable to damage than traditional systems, particularly on the shallow draft, oft changing and sometimes litter-strewn inland waterways.

Here the ZF global network of supply comes into play, as it realizes that keeping a boat in revenue service is priority number one, two and three for these operators. To that end, it emphasizes that a key strategic advantage is that – if the unit is installed as a top-mount thruster – it can be pulled and replaced with a swing unit easily and quickly – sometimes between eight to 10 hours – while the boat stays in the water.

An Engineered Solution

A key challenge in any manufacturing business is controlling costs in the design and production shops, and the ZF Marine thruster business is no exception. In fact, as this business unit produces no 'standard' units, it is particularly adept at looking at the project as a whole to design with the naval architect, with the shipyard and ultimately with the owner what is agreed to be an optimal solution.

"If a client comes in and says 'I want a 2000 horsepower boat,' our first questions are: What do you want to do with the boat?; What are you going to be pushing?; What kind of thrust do you need?," said van der Vegt. He explained that thrusters can offers several power and maneuverability advantages; for example of a vessel outfitted a traditional power train may require a 2000 hp power plant, whereas a vessel outfitted with a thruster may need only a 1400 hp power plant, offering substantial space, weight and fuel consumption advantages. "We want to offer an optimum solution based on what the client wants to do with the boat, and the interaction with the client is crucial" because it doesn't manufacture and house standard thrusters that are simply off-the-shelf.

Prior to the global economic meltdown of 2008, Holland Rudder Propeller – like many of its marine power supply colleagues – had much slower delivery times due in part to the size of the order books, in part due to the fact that parts and materials were sometimes difficult to procure. With the acquisition by ZF in 2009 and the incorporation of its engineering and production philosophies and practices, today van der Vegt said that delivery times range between five and eight months, which is a key plank in extending its platform in North America as

The 2MW Retractable Azimuth Thruster – the largest retractable unit in the ZF Marine Krimpen repertoire – for installation on a new U.K. military tanker.

The company's **next-generation thruster control** system.

he said U.S. shipyards build boats faster than its European counterparts.

Coming Home

While the primary focus of this article is thruster adoption on inland waterways vessels, the market for ZF Marine Krimpen b.v. extends far beyond the towboat sector.

"More and more the azimuth thrusters are used in all types of vessels, said van der Vegt.

"Where traditionally it was generally relegated to ferries and workboats, as the advantages become more obvious we supply units to an ever widening sector, including megayachts, tugboats as well as jack-up vessels and huge offshore construction vessels."

An interesting application which we witnessed first-hand at the Krimpen facility was a massive 2MW Retractable Azimuth Thruster with a 2.4m propeller – the largest retractable unit in the ZF Marine Krimpen repertoire – destined for installation on a new military tanker.

When the ship is sailing, the thruster will be retracted and not in use. Its use on the ship will include:

- As a thruster when the ship is in Dynamic Positioning mode.
- As a transverse bowthruster when retracted
- As a "homecoming" device that – in the event that main propulsion is lost – can help the ship navigate away from trouble and back home.

This project is notable, too, as it features the company's next-generation control system, which incorporates the latest in touch screen, multi-function and multi-layer technologies that is aimed to make thruster operations more precise, safe and efficient.

ZF Marine Krimpen b.v.

When ZF took over in 2009, HRP Thruster Systems B.V. was at a crossroads. It was faced with investing heavily in infrastructure and people to grow its organization to a level where it was capable internationally, or it needed to link up with an organization that already had the global network in place. ZF was the perfect partner in this regard, as it had the established network of sales and service in place, as well as the engineering horsepower and organizational structure to grow the thruster business quickly and effectively.

"Essentially, we went from a small company to a big company, and the way in which we view and approach the market is significantly different," said Frank van der Vegt, Sales Manager, Commercial Craft Thruster Systems, ZF Marine Krimpen B.V. "For example, we could have never pulled off what we did in the Americas market – the penetration of the inland tow boat market – as a small company. This fit was good for ZF Group as well, a privately owned industrial behemoth with $22.4 billion and 72,643 employees at the end of 2013 that wanted to add this technology to its ZF Marine family of products.

HRP has been in the thruster market since 1973, designing and producing a wide range of steerable thrusters for all types of marine applications.

Soft Solutions

Tech morphs design loft into loftier designs

Earlier decision making, modularity cut time and labor costs

By Patricia Keefe

From the design loft to loftier designs and better-built ships, software has changed the face, and build, of nautical vessels. The far-reaching impact of ship design and construction software on the marine industry cannot be overstated, especially in an era of increasing regulation, bigger, sometimes more complex ships, and razor-thin margins.

With shipyards and fleet owners alike, the end goal is the same – cutting costs without compromising safety and reliability. And to hear ship designers, owners, builders and vendors alike tell it, automation, much as it has been in other industries, is the key.

"Software has impacted the full spectrum of the maritime industry – design, construction and ship management. From the design side its primary benefit is to enable the ship designers to optimize ships both from the perspective of efficiency, and to optimize the weight, speed and power of the vessel as well as reliability and safety," says R. Keith Michel, president of The Webb Institute, and former chairman of Herbert Engineering Corp., a provider of ship design and engineering services.

"I think software is crucial for any large-scale design or construction process. If a facility doesn't adapt, it will be out of business," says Prof. Richard Neilson, dean at The Webb Institute, in an opinion echoed by other across the nautical spectrum. "I haven't seen a shipyard work without it. I think creating products of a size today like big cruise liners, is not possible without design and construction software," adds Benjamin Mesing, a graphics researcher at German research institute Fraunhofer IGD.

"We've gone from piles of paper to doing it all on your computer," agrees RDML Joe Carnevale (Ret), a senior defense advisor for Shipbuilders Council of America (SCA), a national trade association representing over 120 U.S. shipyard facilities. "Almost no one I know of is doing paper design. It's All CAD in one form of another. Do all companies have a high-level of 3D CAD processing? No. Lots of companies don't require 3D CAD. They are doing 2D drawings on the computer. The level of automation varies wildly, but AutoCAD is a standard in the industry. People pass around AutoCAD drawings all the time," he adds.

But in the beginning, there was paper. Oceans of it. Millions of paper drawings and huge pattern sheets laid out on the floors of enormous "lofting" rooms. Then came calculations run on expensive mainframes in the '70s, just as the industry was transitioning from slide rulers to calculators. The PC revolution in the early '80s brought affordable computer-aided design (CAD) to the desktop – initially in the form of the now ubiquitous AutoCAD. Naval architecture hasn't been the same since.

Nor, actually, has the collection of related processes involved in the design and construction of ships – from the selection of materials and parts, to the supply chain, to purchasing, scheduling and every stage of manufacturing.

The Paperless Architect

"The old lofting room from back in the day? It's now inside the computer," says Darren Guillory, lofting designer at Leevac Shipyards, LLC, and a user of SSI's Ship Constructor package. "I cannot imagine building a ship today without this type of software. It's a godsend."

"You can build a boat in a whole day on a computer; you can't do that in real life," elaborates Jim Hyslop, Manager, project development for Robert Allan, Ltd., the leading designers worldwide in the tugboat market. That's a far cry from the old design chestnut recalled by Neilson, "Never draw more in the morning than you can erase in the afternoon."

Moreover, "when you build the ship electronically – it's a whole lot cheaper to move a linear box in a 3D model than it is to have to throw material out," notes Jerry Pinkard, a Design Group vice president, at legendary Naval architects Gibbs & Cox, Inc.

It's a whole lot cheaper on a lot of levels, not the least of which are the opportunities to push interferences and rework orders down to a bare minimum by finding, and solving, problems much earlier in the cycle.

Even better are the cost savings realized from repeatability and reusability. "The degree to which you can debug a design so that it is interference-free, and built successfully, and then reuse that same design or design element from project to project, is where you can really see some benefits. Repeatability and setting up your construction facility to build common parts that might be used on multiple different ship designs improves standardization and reduces costs. Lots of shipyards are moving in that direction," observes Thomas A. Schubert, chief engineering officer also at Gibbs & Cox.

That repeatability starts with the creation and ongoing feeding of a library of common parts. It's draw once, use twice - many times over. That capability delivers real economics by really shortening design time. It also helps cut production time as workers benefit from experience gained by working with the same part over multiple projects.

Evolution Leads to Revolution

While the growth in ship design and construction software functionality

In the Background:
Illustration of some shipbuilding methods in England, 1858.

Credit: From Charles Knight's Pictorial Gallery of Arts, England, 1858. Shipbuilding illustrated.

"Design software allows you to really refine your design because you are able to look at more points and really optimize. In the past, you'd take an extremely conservative approach that you knew would work."

R. Keith Michel, President, The Webb Institute

"God help if two guys come in at the same time. I have seen it come to fist fights." (in explaining the fight for space in a design prior to software)

Dean Richard Neilson, The Webb Institute

is seen as evolutionary, many of the changes left in their wake are nothing short of revolutionary.

One of the greatest advantages of design software is the ability to model multiple scenarios – what if we did this or that? In the past, a designer would have to make his bed and lie in it, essentially, by choosing an option and then committing to it. When the inevitable problems arose –it was further down the build sequence. That typically led to a raft of expensive and time-consuming rework orders. C'est la vie.

Not anymore. Today's 3D design software automates the intent of another old naval architect saying: "On my honor I did my best, now let the checker do the rest!" Designers today do their own checking. They can test out online multiple possible solutions to a problem or design decision, or run virtual walk-throughs to make sure there are no obstructions, poorly located or inaccessible equipment or any other issue that might make it difficult to operate or maintain the ship. Catching these sorts of errors early in the design phase means a smoother production process, and consequently, savings in materials, time and labor.

Optimal Designs

Yet for many architects, automation isn't so much about savings as is it about optimization.

"It's always an optimization process when you balance safety and reliability against cost. Today, software has taken analysis to a much higher level than could in the past, enabling lighter, easier-to-build ships, which has brought the cost down," says Michel.

"Design software allows you to really refine your design because you are able to look at more points and really optimize. In the past, you'd take an extremely conservative approach that you knew would work to get through the first pass of calculations, but you wouldn't necessarily go back and refine them. Now you have the ability to look more closely at things," adds Schubert of Gibbs & Cox.

Moreover, before modeling came in, shipyards had to prioritize what they spent their time on, and the most cost-advantage use of engineering in those days was lofting, according Joe Comer, principal and naval architect, Ship Architects, Inc.

"Foundation work was done in the field. If it wasn't modeled, it didn't have a home, and that meant it was up to the production guy to figure out where its home was. And depending on how good he was, it could be screwed."

The placement of piping, conduits and ducts in a particular space was also often left somewhat up to production to duke it out over. Being first into a space to position your parts was a big deal, notes Carnevale. "God help if two guys come in at the same time. I have seen it come to fist fights," adds shipyard veteran and Prof. Neilson.

Those days are gone, and with it, much of the potential for the introduction of interferences post the design walk-throughs. Shop floor drawings now come with all associated data attached to each object, including exact placement instructions. The result is tighter control over the way things are put together, and greater consistency in design follow through.

Getting to that level of accuracy starts with constant communication between the clients, the designer, procurement, scheduling, the "space king," production and manufacturing.

"It's given us the ability to work in geographically distributed areas, with everyone looking at the same model at the same time seeing the same views. It has allowed more participation from clients – more frequently along the way rather than at one or two points during the design process. You get multiple opinions, and can get all parties to agree on the path forward. Building that consensus during the early part of the design process is essential – as changes become more expensive as the design develops," explains Schubert.

But, as representatives of different disciplines are able to spot and relay issues that would affect their piece of the build, corrections and adjustments are made earlier, and placement of ship elements are negotiated.

Bringing Production Into The Picture

And once the design is ready to go to production? It can be used to get shop floor buy-in to the entire project, not just their little corner of it

"The software lets you give the production team a better visual," says Guillory. "Before, they had to see it in their own mind's eye what they were working on. Now, you can have a production meeting with the yard people and give them a 3D virtual tour of the module or unit they are putting together. They can literally look at the boat they are working on before it gets built."

Workers also get a 2D drawing with an assembly packet so they can see where each part goes and get a better understanding of the fitting of the part. Productivity goes up, man-hour costs go down. Construction software tools have also taken the guesswork out of a lot of things yard workers deal with, and in some cases, outright eliminated the need for some tasks. For example, when using a crane to place a large piece of equipment or modules, workers used to have to guess at the weight of the steel, count individual parts and guess their weight and calculate the center of gravity. Now, software tells them down to the individual part what something weighs. No more guessing and hoping for the best.

In another example, Leevac used to have a worker sit with a drawing and a booklet and physically measure where stiffener angle irons would go. Today, construction software does all that. "Now it will literally tell you in bundles "this many at this length" and what the end cuts are, part names, how much it weighs, and where it goes in the vessel. It completely takes out the middle

man," says Guillory. All these changes taken together have "unbelievably enhanced our ability to lower production time on more enhanced vessels,' he adds.

Honey, I Shrunk the Crew

Design software can do more than eliminate a task here and there. It can significantly reduce the required number of crew, saving a substantial amount of money over the life of the vessel, says Alain Houard, vice president of Marine and Offshore, Dassault Systemes, maker of Catia design software and 3D and simulation applications. Shipyards, of course, are using automation and robotics to reduce head counts.

He cited as an example, a requirement by the U.S. Navy to reduce the crew onboard submarines and aircraft carriers. "Crew size was seen as a cost for the duration of the ship over 30 years. We saw aircraft carriers reduce by a factor of 2 the number of sailors on ship. So now you have 5,000 less people over 30 years.," Houard says. Even in the cruise liner industry, where he estimates that you have roughly the same amount of passengers to crew, smaller reductions in personnel are possible.

These reductions are accomplished in part by starting each new project with the design mission and a list of requirements; "you don't start with geometry," says Houard. From there, he explains, the architect designs the minimal amount needed to support the requirements, such as how much steel would be needed or how many people to run the ship. "If you keep the requirements in sight, as you pursue design, you can keep the connection between the design activity and design requirements."

Fishing out the Hidden ROI

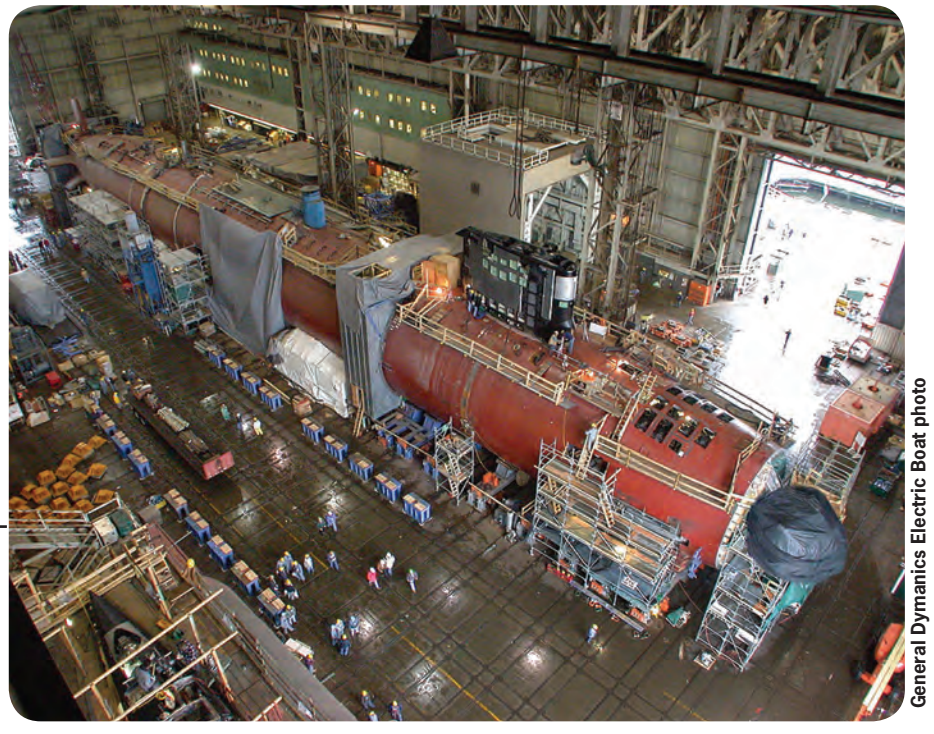
Impressive crew reductions aside, while software is often evaluated in terms of its ROI, when it comes to maritime software – it's not always immediately apparent.

"Early in the design phase" is the mantra in ship building today, and with good reason. But pushing as much decision-making, testing and data collection as possible as early as possible can actually lengthen this part of the process, potentially saving time down the line.

Ship design software, for example, doesn't necessarily save time, and it's probably better if it doesn't. It can actually eat up more time on the front end because of the many avenues through which it enables ship architects to optimize their designs. Much of this revolves around doing more, earlier in the process: meeting more often with more people to collect more feedback to make detail decisions earlier and to embed more fully fleshed out data in the designs and work orders, to creating virtual walkthroughs to test options and root out obstructions and other interferences that could lead to production slowdowns and costly rework if not caught early on.

These workers at Newport News are marking off the design for a ship's plate, using a template as a guide – 1941.

(Credit – Library of Congress)



NMC has initiated a project that will develop simulation models of two General Dynamics Electric Boat machine shops that manufacture the Virginia Class Submarine.

General Dymanics Electric Boat photo

"I don't believe we save in man hours re design versus 40 years ago. The benefit is that we go in-depth to a much greater extent with regard to the design. We do a lot more in the design process, which results in better ships," says Webb's Michel.

From a time perspective, it doesn't necessarily help shipyards build ships any faster either. What it does do, however, is enable the construction of more complex ships period, and in roughly the same timeframe as older, less sophisticated vessels.

And even that savings might not be immediately apparent in some cases. "The cost to build a more complex ship – the time to build is basically the same as to build a less complex model," according to Fraunhofer's Mesing. It doesn't look like a savings, but it is, because more complexity usually means more time to build, and that's not happening generally, thanks in large part to the processes enabled by today's software.

"There are a lot of things that let a ship be built faster. The complexity of war ships has gone up so much it still takes as long or longer to build because they are far more complex than they used to be. But if you take into account the complexity increase, design and construction software does let them be built faster," adds Carnevale.

The payoff is more evident in more common commercial projects. "I think the time saved to build the ship is the reward. Some people say they can save

"When you have being doing something or 2,000 years, you do get stuck in your ways. There are people in the Pentagon who think [ancient Greek mathematician and engineer] Archimedes is working for some Naval Command [group]and he can be ignored."

RDML Joe Carnevale (Ret), Senior Defense Advisor, Shipbuilders Council Of America

"I think the time saved to build the ship is the reward. Some people say they can save 30% in man hours."

Joe Comer, principal & naval architect, Ship Architects, Inc.

30% in man hours. It takes a lot of man hours to manufacture ships. So if saving 30%, you are saving time and saving the customer money." Comer said.

Those savings are greatly helped along by software's ability to aid and enhance the build sequencing (what gets built in what order and in each section, what gets installed in what order) or work scheduling process, by enabling the supervisor to pull together all drawings and related data for each part of each module. In fact, some industry observers don't think this process is possible with the aid of a computer.

Another avenue to achieving positive ROI is modularization. Prefabrication came about during WWII, of course, driven by the need to crank out Liberty ships as fast as possible. But many of the techniques developed during that period were not widely adopted after the war, for a variety of reasons. The arrival of desktop CAD and the growth of automated manufacturing, working hand-in-hand, has greatly facilitated the use of modular construction. Building pieces to a whole in different areas was always possible; fitting them together accurately was the real stumbling block. Stories abound of sections that were built and brought together with mismatched connections. One team thought left, the other right, in a case recalled by Carnevale. Oops.

But it takes an integrated system, an organized shop and the ability to work in tandem with many partners during the design process to cost-effectively build ships in a modular manner.

Challenges to Overcome

Modularity speaks to some of the bigger challenges facing shipyards: to get the most out of their design and construction software, they have to integrate it with their ERP, purchasing and manufacturing systems – no small feat. The challenge of ship building nowadays is to figure out how to set up a planning and production process routine that allows a scheduler or building sequencer to pull out and package all the data needed about each aspect of each section of the ship, and which coordinates with materials purchasing, outside suppliers, deliveries etc. If you don't get this part right? You won't get anything right, insists a 30-year veteran of naval contracting with shipyards. Adds Carnevale, "Nightmares were so widespread that ERP has become a four-letter word."

But integrating these marine applications with the rest of the company's systems – financial, purchasing and manufacturing – is critical to success. With so much data being embedded in the design so early in the process, providing that information to other departments allows parallel processes to take place. For example, purchasing can see at an earlier stage what materials are going to be needed, when they are needed and where they'll be stored or used, and can start working on ordering. And because the design software can more precisely instruct cutting machines on dimensions, weight etc., there is less material waster.

The U.S. Navy, which floated the first completely cyber-built vessel when it launched the USS Virginia submarine, struggled with culture and ERP-level systems integration.

"When you have being doing something or 2,000 years, you do get stuck in your ways. There are people in the Pentagon who think [ancient Greek mathematician and engineer] Archimedes is working for some Naval Command [group]and he can be ignored." jokes Carnevale

Push to Open Up Software

Complicating this part of the process is the issue of open software: Much of the industry's applications are proprietary, which makes trying to exchange or extract data between two different packages cumbersome to impossible, and often in unexpected ways. There was the time, for example, when Ingalls and Bath Iron Works needed to exchange data – the problem was one set of data was generated out of Cartesian coordinates while the other was based on Polar coordinates. Mathematical routines enabled the two sets of data to work together – but with a loss of some accuracy – enough to drive people crazy.

"The challenge today is that the more intelligence you put into a model, the harder it is to exchange with some other system. Some level of data can be transferred, but not all of it," explains Gibbs & Cox's Pinkard. The lack of openness is a major source of frustration in the industry and not likely to abate anytime soon, which forces shipyards to write some of their own interfaces to the packages they need to talk to.

A Little of that Human Touch

While the software significantly cuts down on the introduction of human error, one thing it is no match for, is human experience and intuition.

Greater degrees of automation means that "You don't have that human error inserted every time you go from a drawing to material, to tech manuals to maintenance," says Carnevale. He tells a story of a project involving a mixed gas diving system that required specialized fittings, valves and connectors – all special orders with long lead times. In particular there were six elbows in the piping system. Once his team, got to the point of installing the parts, it turned out that in several cases, the materials list did not match the number of fittings required, thanks to human error that was never caught. "It delayed us – it had a major impact. Simple things like that can be eliminated by a computer system. When a computer system counts, it does not fail to count."

CAD also tackles human error by allowing the design to embed all the information associated with an object into a drawing of it. It's the first step in translating an architectural drawing into a material ordering process.

However, software is still no substitute for human innovation, "says Fraunhofer's Mesing. "Experience is still a very important factor. Even if you

have a good solution today, an inexperienced architect can't create a ship for you. There is a lot of intuition involved in where to put modules, for example, and the flow of things, that can't be automated."

Back to the Future

There is a lot on tap for the future. Regardless of software application – design, construction, fleet management or operations – the path is clear. What designers, shipyards and fleet owners want, what they and analysts say are needed, is integration, mobile devices on the production floor, simulation and tools to make better use of the collected data.

Look for integration on multiple levels. Much of the software available today is all or partially proprietary. There may be an Autocad link at some point, but the lack of open protocol support is a major headache. Reusability is a key concept in cutting shipbuilding costs, so no one wants to have to rely in data that won't transfer over, or be forced to print it out on the paper they are trying to leave behind.

They also want to be able to pull in and analyze information from multiple sources in order to optimize as much as possible their ship designs and eliminate as much as possible mistakes at any point in the supply chain and manufacturing process. Rework is lost dollars, plain and simple.

Paper is still big on the shop floor. The way to get away from it is to equip workers with mobile devices that they can download job assignments to – complete with 3D images and assembly information packets – and in some cases, point their devices at objects or processes and either launch an activity or get more in-depth ta. No more running over to the paper board and double checking measurements.

It's not as expensive as you might think – business analysts are already talking about a crash in the tablet market as cell phone makers move to absorb more features into their smart phones, which in turn, will drive down hand-held device costs. It's also closer than you might think. According to Dassault's Houard, Japanese ship yards are already deploying mobile devices for production work. Users can expect to see greater use of cloud computing and 3D, even 4D modeling is coming down the pike.

Between the capabilities currently available, and the wave of new functionality building up down the road, ship designers and builders that are committed to automation can look forward to even greater cost and time savings – and without compromising the tenets of safe sailing,

Marorka's Powerplay

As Ole Skatka Jensen settles into the CEO suite at Marorka, Maritime Reporter & Engineering News catches up with the industry veteran to discuss the future direction of this provider of online shipboard energy management systems.

By Greg Trauthwein, Editor

What attracted you to the top spot at Marorka?

I have always be attracted to new technologies and being part of MDT development over the almost last 20 years gave me a great opportunity to be in the forefront of new technology development. Marorka has been developing Marorka energy management solutions for the last 12 years, and have great experience in the growing energy management sector and an unlimited potential in this field. I am attracted to new challenges and at present Marorka is entering a considerable growth phase, and managing such rapid growth phases is the challenge that attracted me to Marorka.

For our readers not familiar with your company, please describe it.

Marorka is a leading provider of on-board and online energy management systems for the international shipping industry. Marorka's products and services enable vessel operators to optimize fuel consumption by maximizing the energy efficiency of their vessels. The results are minimized harmful emissions and reduced costs.

We regularly talk about 'ship efficiency' regularly in our pages, print and electronic. Put in perspective for our readers an overview perspective (during your career) that puts fact and figure to the increase in ship efficiency.

At Marorka we are focused on the ship's energy efficiency. Generally one can divide "ship efficiency" between the fixed technical aspects of energy efficiency that is determined by the design of the vessel and then we have the operational factors. For the technical part we are seeing some interesting development in the design of ships where computer aided ship optimization is on the rise with new ships being built. At Marorka we are looking at the efficiency from energy efficient operation. During the past two decades there has been increased development towards better energy efficiency when we have seen fuel oil prices rising. By optimising the fleet, ship operating companies can expect savings up to 10% in fuel, depending on the ship, managerial circumstances etc.

What have been the primary drivers in this regard?

In the past, the main driver has been to reduce costs or rather optimize the use of fuel. Today the environmental factors are becoming more and more important as we are all showing more awareness towards the environment and companies with better environmental footprint are gaining competitive advantage in supplier evaluation. The good thing about our offering in Marorka where we are focusing on improving the energy efficiency in operation you get both improved environmental footprint and very

MARORKA

Ole Skatka Jensen

Date of Birth	June 22, 1966
Nationality	Danish
Marital status	Married, two children

Ole Skatka Jensen joined Marorka as CEO in May 2014. Ole has extensive experience of the international maritime sector and has worked in a diverse range of cultural and business settings, including starting up companies in Malaysia, the Netherlands and Qatar. He has also been involved in organizational restructuring in connection with acquisitions in several countries. During his 20 years in various MAN Diesel & Turbo overseas entities and functions, Ole amassed a wealth of multi-cultural experience on many levels after 16 years living and working in South East Asia, Central Europe and the Middle East.

short return on investment.

With the economic need to run more efficient ships, and the legislative demand cleaner ships, there have sprung to life a great many providers of "ship efficiency" solutions to this sector. How does Marorka stand out?

Marorka focus on improving energy efficiency by applying computerised energy management solution has a solid theoretical background and foundation; the roots of the company are from 1997. An entrepreneurial start born from a PhD study, the company spun off from the academic world, formally established in 2002. Since then Marorka has put a lot of effort in further developing and fine tuning our solutions and methodology. By implementing a wide variety of data collecting we get a holistic approach which leads to a transparent overview of the fleet. Hence the ship operators have greater power to advice on managerial level more efficient handling of their fleet.

When we have this interview again in July 2015, what change(s) do you envision discussing?

Marorka will have enforced its position as the leading Energy Management Company for the maritime sector by continuously development and improvement of our energy management solutions and project implementation. Our fleet implementation program have taken the installation of Marorka systems above 750 systems. We have opened our offices in Copenhagen, Singapore, Korea, Shanghai and strengthened our presence in Middle East and Europe

Our expansion and growth strategy will have resulted in one or two acquisition in relevant fields. The new emission regulation will be enforced from January 2015 which will be an impetus for shipping opera-

tors and owners to adhere to regulations with more automatic reporting and a better overview.

Please provide some statistics on the number of installations Marorka has today, with specifics on the size and types of ships where Marorka might be found.

The number of our references is about 400 ships. While most of our references are from relatively large container ships, tankers and bulk carriers, we have all types and sizes of ships fitted with our systems. We have also some very interesting and special ships as references such as research ships, coast guard, fishing vessels and host of off shore vessels.

Every business has its challenges. What are Marorka's?

The big challenge for us is to keep providing outstanding services to a growing customer base that is located around the globe. We are addressing this challenge by adding more people to our organization and by opening up our own offices in strategically selected locations. First we are opening our office in Copenhagen this summer. Next phase is to open up offices in the Far East and strengthen our position in the Middle East. Successfully managing such rapid growth is always going to be challenging. We have prepared well by having developed solid infrastructure and procedure.

Can you discuss a recent case study?

Laurin Maritime operates a modern fleet of MR tankers for oil products and chemicals worldwide. It started with an energy conservation program in 2008, and identified the need for an automated data logging system. In 2012, they chose Marorka as provider of that system. "Today, fuel costs are higher than the daily cost of operating the vessels. It has become necessary to shift our focus over to fuel costs. We identified a need for a system that could monitor fuel performance. We decided to implement an ISO 50001 energy management system on a company wide basis, and we have implemented a system that makes energy usage transparent for the crew and onshore management. We use Marorka Online to collect data for long-term analysis, to establish fleet trending and to highlight the "cost of lost energy," said Capt. Pär Brandholm, Laurin Maritime's Environmental & Nautical Manager. "The Marorka Maren Solution gives us much better information about what is actually happening on the ships. We can now accurately quantify the fuel oil savings we are achieving from hull and propeller cleaning. To date, we have experienced savings of 9.4% in fuel oil consumption as a result of our energy management activities. The Marorka project has yielded more the double the amount of savings that would have given us a good return on our investment."

Indian shipbuilding on the toad to recovery

Indian shipbuilders buoyed by a renewed political will, a plan and funding to help the industry recover.

By Joseph R. Fonseca, Mumbai

It has been a long wait for the 28 shipbuilders in India to finally catch sight of opportunities to sail back into the better financial waters. The newly elected Narendra Modi's BJP's party brought in a strong stable government, the first in nearly 30 years, and has given an unprecedented, massive boost in promoting Indian shipping in its recent Union Budget.

Most industry stakeholders consider this to be a very positive and unexpected turn of events, as the previous succession of governments that have been largely unsupportive of all matters maritime, despite the industry crying itself hoarse for a level playing field to enable it to face cut-throat overseas competition.

The Indian shipbuilding industry has been in shambles: Without exception, it has been downhill for nearly all ship builders over the last decade not only because of the economic downturn but mostly because of the lack of support from the government. The Indian shipping tonnage too has been hovering at around 10 million DWT for several years.

Because of the lack of financial and governmental support, many ship yards have been unable to prosper. Also, there has been hardly any encouragement for Indian ship owners to place orders for new buildings in India. Left to fend for themselves in the past six years, Indian shipyards have seen their share of the global order book slip from 1.3 percent to less than 0.1 percent.

Of the 28 shipyards eight are government owned and 20 are in the private sector. Despite recent poor performance, India has a number of logistical advantages in its favor, including a vast 7,517 km coastline for shipping, a strong labor force and the low cost of labor. These advantages, however, are outweighed by the lack of high capacity shipyards, lack of trained engineers and skilled labor and almost total absence of government support and initiative.

In India, most classes of vessels are allowed to be imported into the country without payment of custom duty, unlike most other shipbuilding countries. Indian shipyards continue to be outbid by Chinese and South Korean builders because of the cost differentials arising out of this lack of support for the industry.

Forty percent of India's international cargo that used to be moved on Indian bottom two decades ago has come down drastically to just 8% and the country continues to lose foreign exchange by way of freight lost to foreign lines.

"Several new building opportunities are likely to come up in the near future as **the government plans to shift at least 15% of the cargo transported by road and rail to the coastal and inland waterways."**

Diversification: The Way Out

The industry has been looking at other opportunities in the absence of new building orders, such as ship repair and ship conversions. However since the requirement of infrastructure for repair of ships is much smaller compared to building ships – a large portion of the infrastructure remains unutilized at the Indian shipyards.

"Like many other shipyards we too have switched to undertaking ship repairs," said M.A. Siyad, Project Manager of Cochin Shipyard, one of the major state-owned yards based in South India. "Though we have a number of orders both from the Indian Navy including an aircraft carrier now under construction, as well as orders from overseas shipowners, we are in the process of setting up a ship-lift facility 130 x 25 m that will have a capacity of 6,000 tons. It is encouraging to note that other shipyards, which have set up ship lift facilities, secured encouraging results including Chowgules' shipyard at Jaigarh, Dempos' and Goa Shipyards in Goa and Karwar, all based on the West coast of India."

The past decade saw the birth of only two major ship yards, the Pipavav in Gujarat, Western India, and that of Larsen & Toubro (L & T) at Kattupalli in Tamil

Nadu in South India. But they have ended up facing a slump like the others and are putting up a bold front to improve their lot, much the same as other major private builders including Bharati Shipyard, ABG Shipyard and Modest Infrastructure. The Defense Ministry and the Coast Guard has been able to come to their assistance in the past few years placing orders to meet their requirements.

But Anand Sharma of Mantrana Advisory, a leading consultant in the maritime field points out, "There are plenty of new building orders in the pipeline from the Indian defense sectors. However, the infrastructure with the Indian shipyards is far higher than what can be met by defense new building orders. Hence, defense orders would certainly provide some cushion to Indian Shipyards. It is not going to increase their capacity utilization completely. Moreover for all high-end ships in the defense sector, Indian Shipyards have neither the desired technology nor the know-how to build them."

Help Arrives

But as all 'bad things' too, come to an end, the recent budget of the Narendra Modi's Government has brought back the lost smile on the faces of India's ship builders. The trade and industry pundits are elated having Narendra Modi as the prime minister, since he has been instrumental in bringing about vibrancy in his home state – Gujarat, where he was the Chief Minister for over two decades until he relinquished the post to take over as PM last month. The country's focus is on him for replicating the model of his home state for the rest of the country in general and in ship building and repair industry in particular.

Several measures and policy changes have been brought into place in the budget of July 10, 2014. The Finance Minister Arun Jaitley announced in his budget speech that the government will unveil a comprehensive policy to promote Indian shipping and ship building. He has promised to do away with the plethora of taxes that hound Indian shipping. He announced a reduction in taxes for the coastal shipping sector to encourage growth in transport of goods on local routes through coastal ships. The setting up of 16 new ports at a cost of $1.85B and the announcement of putting in place of 24 x 7 customs clearance facility in the major ports as well as a single window facility would greatly facilitate India's international trade as well as coastal.

A major boost is the project on the river Ganges called "Jal Marg Vikas" (National Waterways – I). This involves developing the waterways from Allahabad in Uttar Pradesh to Haldia in West Bengal covering a distance of 1,620 km to enable commercial navigation of at least 1,500 tonne capacity vessels and help boost capacity hauling goods along the inland waterways. The project is to be completed within six years at an estimated cost of $0.7 billion.

Coastal Shipping

Commenting on the recent budget Anand Sharma had this to say: "Several new building opportunities are likely to come up in the near future as the government plans to shift at least 15% of the cargo transported by road and rail to the coastal and inland waterways. Further, only ships made in India and operated by Indian shipowners will be allowed to move the cargo on the coast which is a welcome move. However, the number of vessels available for coastal movement and inland waterways movement are very small and of low value. Hence, the opportunities arising from that sector would mostly be taken by smaller shipyards in India and to some extent may benefit the large shipyards in India."

Capt. Sandeep Kalia, Vice President of Indian Coastal Conference Shipping Association said, "For the first time the government has given an unprecedented boost to coastal shipping and inland waterways transport. Today, there are around 638 vessels under the Indian flag operating along India's long coastline. The government's plan is to double the cargo transported along the coast in five years, which means there will be a need to double the number of vessels that will have to be built by Indian shipbuilding yards.

To help shipyards come out of the red the government has been in discussion with the Shipyard Association of India (SAI) for formulating measures for funding. Prashant Govil, Advisor to SAI said "We have been in talks with the Ministry of Shipping, government of India for finalizing details on the creation of a fund for ship building. A corpus of $16.7B is to be formed by IDFC with investments from foreign investors, foreign banks and financial institutions. Called the 'Shipbuilding Development Fund for Low Cost of Capital' funds from this corpus maybe used to provide shipyards term loans and working capital loans – at interest rates of 6.5%."

Another proposal is for raising ECBs for Working Capital and Term Loans. For this a financial institution will be appointed as a nodal financial agency with a dedicated window for providing finance to the shipbuilding and shipping sector.

The agency will raise ECBs, and in turn provide loans, with a minimum fixed spread over ECB borrowing cost, for both working capital and long term capital (of say tenure 25 years and a moratorium of 2 years), to the Indian Shipbuilding industry. The proceeds could also be utilized by shipyards for prepayment/repayment of term loans and working capital loans. It is also proposed to allow shipyards to utilize the proceeds of ECBs raised directly, for meeting the requirements of working capital, as well as prepayment/ repayment of term loans and working capital loans. This is in addition to the prevailing ECB guidelines, which allows the proceeds of ECBs to be utilized for capital expenditure only.

There is also a proposal to give shipbuilding an Infrastructure Status. This will help the shipbuilding sector to be on par with those of others countries that enjoy similar status such as long gestation periods and high capital expenditure.

Thus shipbuilding industry in India will be able to access financing at preferential terms (low interest rates and longer terms) as well as avail tax benefits - if infrastructure status is granted to the sector.

The government has set the ball rolling and the industry experts are confident of seeing better days ahead. Having survived the downturn Indian ship builders can no doubt be expected to come out much stronger in time to come.

Five Minutes with N-COM CEO

Abu Bakar Mohd Nor

In the Middle East there has been a level of shipbuilding infrastructure investment unmatched, with companies such as N-COM in Qatar among the leaders. N-KOM CEO Abu Bakar Mohd Nor shares his insights on growth & opportunity in the Middle East.

By Greg Trauthwein

When you look at the expanse of your operations, what do you count as the primary strength of your company?

One of the most important strengths N-KOM has apart from its strong parentage is being strategically located in Qatar, the world's leading exporter of liquefied natural gas (LNG) and at the heart of the Arabian Gulf, which is teeming with offshore activities. By leveraging on the expertise and resources of both Keppel and Nakilat, N-KOM is able to offer a comprehensive range of repair, conversion, maintenance and fabrication services to marine, offshore and onshore industries. Having surpassed 250 projects to date, the shipyard consistently wins new and repeat clients with its track record of safe, quality and timely deliveries.

Shipyards are obviously capital intensive. How is N-KOM investing today, in its facilities?

Despite being a relatively new yard, N-KOM is heavily investing in further development of its facilities to keep up with market trends and demands. With increasing marine traffic and offshore ac-

-tivity in the region, we are already seeing stronger demand for quality and reliable repair and maintenance services from ship owners/managers and rig operators. As such, two floating docks - one VLCC size measuring 405m by 66m – and another Handymax-size floating dock measuring 163m by 26m, are under construction and will be operational by 2015.

These floating docks will not only double the yard's docking capacity but also enhance its flexibility in scheduling repairs as the volume of work increases. In addition to this increase in docking capacity, N-KOM has also established tank cleaning services for crude oil tankers as demand for this service grows apace the number of tankers plying the region. Being flexible with the provision of demucking and deslopping services either at Ras Laffan anchorage or while the vessel is en-route to the shipyard from Fujairah, further enhances the shipyard's attractiveness as a one-stop service provider.

How is N-KOM investing today, in training and in people?

Our people are our greatest asset. As such, we have a comprehensive training program for every employee to ensure they reach their maximum potential. Training is mostly conducted at our in-house training center and not only focuses on enhancing technical skills but also on enriching their personal development.

What, specifically, does your facility, your staff offer to ship owners that is unique to the region? Unique to the world's ship repair industry?

There are several unique selling points of N-KOM that few can compare with, such as its strategic location at the heart of busy shipping routes in the Arabian Gulf and having parent companies whom are leaders in their respective fields – Nakilat (Qatar Gas Transport Company) being the world's largest owner of LNG vessels and Keppel Offshore & Marine, a name synonymous with excellence in the areas of ship repair and conversion.

By leveraging on the strengths and expertise of our parent companies, N-KOM has successfully completed drydocking and repairs for more than 100 gas carriers in a short span of three years. We have carved a niche area for ourselves as the gas solution provider of choice, riding on the green shipping wave and latest IMO regulations.
As part of its value-offering, the shipyard provides a 'flying squad' to undertake marine repairs at the port and anchorage(s) as well as voyage repairs. A separate offshore team holding certifications from CDC, TBOSIET and H2S, can also be mobilized to undertake offshore hook ups, commissioning & installation as well as support services for Brownfield and new platforms.

Looking at the market overall, where do you see the best opportunity for growth in the coming few years?

We are seeing more demand for construction, repair and maintenance services as offshore activities continue to increase in the Arabian Gulf. The growth observed is parallel to that for the demand of offshore accommodation jack-ups, otherwise known as liftboats. There is great potential in this market and N-KOM, together with its partner companies, is well poised to cater to this demand. As it is, the shipyard has commenced its first offshore newbuild construction this year.

Every business has its challenges: what do you see as the biggest challenges for your company's continued growth and success in the coming years?

Qatar's maritime cluster is still at a nascent stage, though it has been rapidly building up over the past few years with the new Doha Port project and other developments in the maritime

Recent jobs completed by N-KOM (clockwise, starting left)

1. Euronav's crude oil tanker Cap Felix drydocked in N-KOM.

2. Janah Star, the 200th project.

3. Maran Tanker's VLCC Maran Carina and Lino Marine's chemical tanker Chemroad Vega undergoing afloat repairs at N-KOM.

4. Gulf drilling international jack up rig Msheireb.

sector. With a wider range of vendors and suppliers available locally, N-KOM can then be even more competitive.

Recent Projects of Note Completed at N-KOM

• Suezmax tankers Cap Felix and Cap Lara from Greek company Euronav were at the shipyard for repairs and drydocking back in 2013. General repairs were carried out for renewal of steel plates, overhauling of cargo pumps, mooring winch repairs, renewal of rudder carrier bearings, atmospheric condenser retubing, overhauling of main engine turbochargers and units, propeller treatment and switchboards inspection. A key element of both projects was the installation of a MEWIS duct. Additionally, major tail-shaft and intermediate shaft repairs were carried out for Cap Lara. This involved the removal of its propeller shaft and intermediate shaft for flange machining using our 50T Lathe Machine and in-situ boring of intermediate flanges.

• N-KOM has undertaken its first Ballast Water Treatment System (BWTS) retrofit for RasGas chartered LNG carrier Al Utouriya. Operated by NYK LNG Shipmanagement, the Q-Flex vessel was installed with Ocean Saver's 3000 cu. m./hr. capacity Mark II system (DNV-approved) during its drydocking period at the shipyard. Fabrication and installation of all steel supports, major components and pipework were carried out concurrently with other general repairs by the N-KOM project team. Highlights of the repair include the installation of C2E disinfectant unit and steam heaters, main filter units and pumps on filter platform, C2E filters units and C2E pumps on the C2E platform, hydraulic power pack unit on sub-platform as well as modifications on the ballast piping.

• Major repairs of the cargo containment system were recently concluded for a GTT MKIII-membrane LNG carrier at the shipyard. Following a Secondary Barrier Tightness Test (SBTT) and acoustic tests, cargo tank containment specialists Gabadi S.L. were engaged to undertake repairs in all four cargo tanks on the vessel. Other key components of the workscope included turbine overhauling, boiler repairs, main condenser bellows renewal and cleaning and overhauling of all cargo spray pumps and cryogenic valves.

• Emergency collision damage repairs were undertaken for an LNG carrier at the shipyard this year, involving more than 150T of steel fabrication. Despite the short-notice vessel arrival and complex nature of repairs, which involved cropping and renewal of the damaged side shell, bulbous bow, deck plating and its attached internals, the shipyard was able to quickly turnaround the project and deliver on time, budget and schedule to our customer's satisfaction.

• Jan de Nul's 27,240 kW J.F.J De Nul, the world's most powerful cutter suction dredger, underwent major mechanical repairs during its drydocking period at the shipyard early this year. The dredger's entire spud carrier, traveling cylinder, spud and ladder hoisting shaves were over-hauled, including its cutter drive and inboard pump drive coolers. The coolers' 6000kW motors were subsequently overhauled in our electrical workshop. Other notable repairs carried out were the overhauling of the deck crane bogie, reconditioning of toothed racks on crane rails, propeller blade repair utilizing hot treatment, flywheel calibration as well as hull coating work.

Realizing the promise of **Brazil** shipbuilding

If and when Brazil gets its maritime act together, oh what a shipbuilding market force it could be.

By Claudio Paschoa, Rio de Janeiro

The modern Brazilian shipbuilding industry was established in the 1960s, induced by a broad and effective governmental policy. The 1960's and 1970's saw the rise of the merchant marine and shipbuilding industry in Brazil. The creation of the "Merchant Marine Fund" and the "Tax for the Merchant Marine Renewal," in 1958, together with other specific targets set by the government at that time, made investments available to the shipbuilding industry and for the development of the merchant marine in general.

Counting on such incentives, new shipyards such as Ishibras and Verolme were built, old shipyards were renovated and in the late 70's, the Brazilian ship building industry was the second largest in the world, employing more than 40,000 workers in 1979.

The shipbuilding, maritime equipment and shipping industries, as well as engineering and other maritime related service sectors, experienced a sharp growth curve, up to the mid 1980s. The Brazilian shipbuilding Industry was second only to the Japanese shipbuilding industry, albeit relying mostly on cheap labor to reach this milestone. From that time to the beginning of this century, the Brazilian maritime industry endured a prolonged and severe death spiral downward. The industry was downsized and the merchant fleet greatly reduced, in many cases even abandoned, with most of the remaining shipyards closing or sold off to foreign investors. The marine equipment industry practically disappeared.

Today, however, the shipbuilding industry is embarked on a strong rebound exhibiting a sharp growth curve, mainly due to the discovery of deepwater pre-salt oil and gas offshore Brazil, and the state-owned tanker fleet and supply vessel fleet are the segments of the Brazilian-controlled shipping industry in better conditions.

During the last 13 years, the Brazilian shipbuilding industry has experienced massive growth. The workforce has swelled from a low of less than 2,000 to more than 78,000 workers today, a trend expected to continue as new shipyards begin operations. Brazilian shipyards have recently delivered a record amount of ships and production platforms. In 2013 deliveries included six production platforms, 21 support vessels, 10 port tugs, two oil tankers (Promef) and 44 river barges. In the same period two new shipyards were launched: Aliança Offshore in Rio de Janeiro and VARD Promar in Pernambuco, Northeast Brazil, while another two shipyards concluded expansions: São Miguel Shipyard in Rio de Janeiro and Wilson Sons in São Paulo.

Understanding the Promef Program

The Fleet Modernization and Expansion Program (Promef) has propelled the reconstruction of the Brazilian shipbuilding industry after a decades-long crisis, with an investment of R$11.2 billion in the order of 49 ships and 20 waterway convoys. Brazil currently has the world's fourth largest backlog of orders for ships, and the third for oil tankers. With the seven first Promef ships delivered, the local content index will be higher than 65%, the quantitative figure stipulated for the first phase of the program, ensuring generation of jobs and income in the country. At the Mauá shipyard alone, where the José Alencar tanker was built, 3,400 jobs were created, of which 1,200 were directly involved in the construc-

Keppel Shipyard in Rion.

(Photo: Evandro Cruz)

tion of the vessel. Promef has three stated goals:

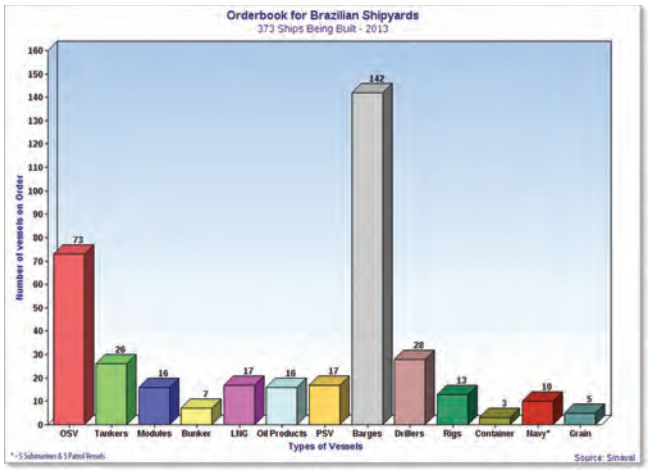
- Build ships in Brazil;
- Reach a minimum domestic content index of 65% for the first phase, and 70% for the second phase;
- Attain international competitiveness, after the learning curve.

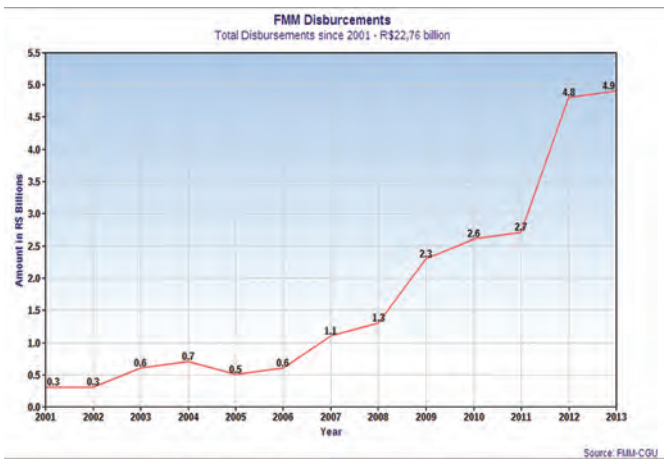
The first two goals have already been achieved, and with them, Promef has helped to resurrect cue the Brazilian shipbuilding industry. The third goal, the pursuit of international competitiveness, is the current focus, yet it may be the hardest to achieve. To attaint his objective, Transpetro has created the Production Monitoring System (SAP), which has the function of evaluating the production processes of the shipyards and suggesting alternatives to improve productivity. Even with the SAP system in place, it still remains to be seen, which shipyards and how many shipyards will make the necessary effort in infrastructure, equipment, workforce training, product quality and last but not least, meeting delivery deadlines, in order to successfully compete in the international shipbuilding market. The main players of the international shipbuilding industry, such as Japan, South Korea, and China, have had 63, 53, and 23 years, respectively, to reach maturity in the sector. According to Petrobras, in only 13 years, Brazil has already obtained results comparable to those of the Chinese market. That would be a debatable point at best.

Present and Future Outlooks

It is widely believed that the Brazilian Shipbuilding Industry is now facing a consolidation period, where it will need to continue attracting local orders, with an eye at competing for international orders in the future. Brazilian shipyards will need to reach and maintain high levels of quality and safety while keeping to all important delivery deadlines. Meeting deadlines has been one of the major problems of the industry, with significant delivery delays having been reported. The major client of Brazilian shipyards is Petrobras, Brazil's national oil and gas operator, which also is largely responsible for this resurgence of the defunct Brazilian shipbuilding industry. According to Ariovaldo Rocha, the president of the National Union of Construction, Ship Repair and Offshore Industry (Sinaval), the increase in planned investments in E&P by Petrobras indicates that Brazilian shipbuilding orders will be maintained. "The offshore segment, platforms and drilling rigs represent about 60% of the shipbuilding order book and with the construction contracts for 35 drilling rigs this participation will increase," he said. For the agents of the naval sector, the order book scenario remains optimistic. Sinaval also highlights that Petrobras's investment in the local shipbuilding industry up to 2020, includes orders for 38 production platforms, 49 tankers, 28 drillships and 207 OSVs.

According to Petrobras, in 2014, Transpetro is expected to set a record in the receipt of new vessels. The planning under the Promef program foresees the receipt of six vessels and of three inland waterway barge convoys built by Brazilian shipyards. The record was set in 2013, with four deliveries: Product carrier Rômulo Almeida (January) and Suezmax ship Zumbi dos Palmares (May), both now in operation, and the José Alencar (Products) and Dragão do Mar (Suezmax) vessels, the latter two having made their maiden voyages in February 2014. By 2020, the fleet is expected to grow from 60 to 110 vessels. The ships foreseen for 2014





are two Panamax (Anita Garibaldi and Irmã Dulce), two Suezmax (Henrique Dias and another one as yet unnamed) and two gas tankers, one of which the Oscar Niemeyer, is currently in its finishing phase.

However, some policy and regulatory bottlenecks still reduce competitiveness in the domestic shipbuilding industry. Absence of core government focus on issues relating to the segment is one of the main complaints from the industry. "Shipbuilding in Brazil could be aspiring to far greater numbers than those that are circulating in the market if there was a coordinated government policy towards seriously considering a resumption of shipbuilding in this country. The Ministry of Industry [Development, Industry and Foreign Trade], which should be the father of Brazilian naval affairs, has no consistent and comprehensive rules for the industry," said Cesar Prata, the chairman of the Sectorial Chamber for Marine and Offshore Equipment (CSEN) of the Brazilian Association of the Machinery and Equipment Industry (Abimaq). The vice president of the Federation of Industries for the State of Rio de Janeiro (Firjan), Raul Sanson, agrees.

"We feel that the government is still in the organizational phase. In our view, there is a lack of coordinated meaningful dialogue between ministries and the maximum authority," he said. Roberto Galli, executive vice president of the National Union of Maritime Navigation Companies (Syndarma), shares this viewpoint. "Brazil is still a complex country and the complexities result from a diffuse responsibility framework amongst authorities with regard to regulatory structures. There is a superposition of government entities within the regulatory framework and this is not good, things are not well defined."

This leads to another obstacle: the absence of an industrial policy. Cesar Prata said all that exists now are emergency measures taken to "put out small fires." One of the most recent was the payroll tax exemption for some sectors such as machinery and equipment and for the shipbuilding industry.

Another complaint from segment representatives is in relation to Brazilian taxation, which has reduced domestic supplier competitiveness. One aspect of this taxation policy is Repetro, an artifice created by the government which allows the importation of specific equipment to be used directly in research and exploration of petroleum and natural gas fields, without the incidence of certain federal taxes. The president of the Brazilian Association of Shipbuilding and Offshore (Abenav), Augusto Mendonça, has defended tax isonomy for the sector. "From the shipyard's point of view, I prefer to buy from abroad rather than in Brazil, it is much simpler, and here there is still residual tax that that cannot be avoided such as ICMS, for example. National and imported equipment must have the same tax burden."

According to Prata from Abimaq, Repetro stimulates imports, since it concedes exemptions even when there are similar domestic products, thus damaging the local suppliers. Although positive in some respects, the executive points out that there should be changes in the system. "Continue with incentives on those items that Brazil does not have or want to produce, but why encourage imports for those products which Brazil has already been competently making for decades? No, domestic content must be stimulated," he said.

Local Content Policy

The local content policy is one of the issues that has been at the forefront of debates in the sector. Petrobras, during the presentation of its new business plan, highlighted the implementation of the Measurement and Monitoring of Local Content Program. The goal is to make the most of the domestic goods and services industry's competitive capacity to meet the plan's demands with timelines and costs according to best market practices. "We have a program set up so that we can monitor and demonstrate that local content is feasible for accomplishing our projects. It's no good just planning, we need to prove that we have achieved local content," said José Miranda Formigli, Petrobras' director of exploration and production. The first step in the company's plan of action is defining the minimum local content in the planned projects. For this, imported goods and services, and those items already nationalized, will be identified. The next step is monitoring local content by checking the proportion in the projects and acting to correct any price or term deviations. The last phase is recording local content, in which reports will be prepared to demonstrate local content per project and updating the database for future projects.

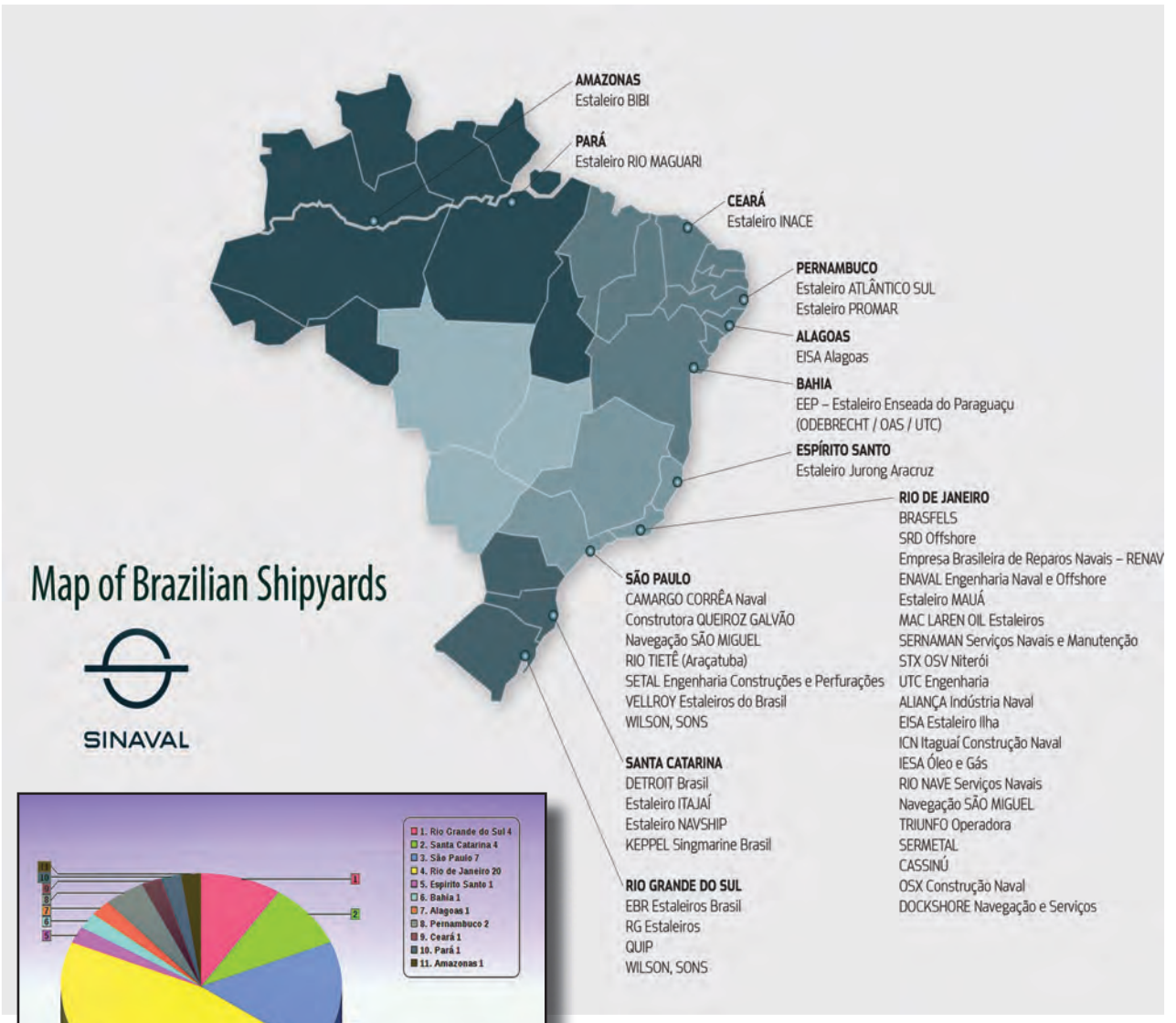
Sinaval is ready to help Petrobras in this program. The institution has mapped the local content situation in relation to supplying ships and platforms. The document shows that for tankers the index has reached 70%. In the case of support vessels and FPSO platforms, the percentage is 61% and 63% respectively. Of the total value for ship and PSVs, local participation is on average 64% in these three groups. The National Organization of the Petroleum Industry (Onip) has also developed a set of actions relating to the matter. One is the Platform Technology Program for the Oil & Gas Industry (Platec), a joint effort by the organization and the Brazilian Institute of Oil, Gas and Biofuels (IBP), funded by FINEP with CT-Petro resources. This was designed to promote compliance with the technological innovation demands of the oil, gas and maritime industry and search for and identify suppliers with the potential for nationalizing goods and services currently being imported.

Building Partnerships Abroad

The local shipbuilding industry has

also been strengthened by partnerships with major shipbuilders such as Hyundai Heavy Industries from South Korea and other major players from Japan, Singapore and Europe. These strategic partnerships generally involve not only technological transfer but also a wealth of experience in efficient ship design and shipbuilding practices and procedures which promise to sharpen the learning curve of Brazilian shipyards, decreasing the time local shipyards will need to become competitive internationally. These partnerships will also help attract foreign clients to local shipyard because they will potentially increase a prospective client's confidence that they will receive quality products at the agreed deadline, yet there is still a long way to go in order to consolidate the Brazilian shipbuilding industry and make it attractive to international clients. For now the industry will continue to depend on Petrobras orders, which evidence from Petrobras' business plans shows will continue to be forthcoming for at least another decade. However, the industry can by no means become complacent as foreign shipyards are also looking to attract Petrobras orders.

Brazilian President Dilma Rousseff said last April, during the ceremony prior to the maiden voyage of the tanker Sea Dragon and the baptism of the cargo ship Henrique Dias at the EAS shipyard, "I am proud that we have rebuilt the shipbuilding industry. We have radically changed our buying policy in order to choose local products." The Brazilian President believes Brazil needs the shipbuilding industry to become richer and strongly defended federal investments in the sector. With guaranteed government support, along with large orders from Petrobras, the Brazilian Shipbuilding Industry growth curve is set to continue rising for at least another decade.



ASRY all in on Project Jupiter

Project Jupiter, an initiative to create a leading portfolio of Onsite Specialist Contractors, sees ABB, SOLAS, Seven Seas and more invest $3.7m at Bahrain-based ASRY in 2014, with more in the pipeline.

ASRY has seen several global specialist contractors, including ABB, SOLAS, and Seven Seas increase their investment at the shipyard to provide more substantial services to ship and rig owners over the course of 2014. The moves are a part of Project Jupiter, an initiative launched to make ASRY the leader in Onsite Specialist Contractors in the Middle East, which has several more international names lined up to boost their presence at the Bahrain-based shipyard.

Current investment from Specialist Contractors in the yard already totals approximately $3.7m, and with new confirmed clients in the pipeline, that number looks set to rise to at least $9.2m by the end of 2014.

"This new initiative will give ASRY the highest quality mix of Onsite Specialist Contractors in the Middle East to ensure that any global owners needs are catered for specifically and efficiently," said Nils Kristian Berge, ASRY Chief Executive. "By being able to offer the comprehensive range of specialist services on site, there is less need for owners to bring specialized engineers. We've already seen important names like ABB, SOLAS, and Seven Seas open new or bigger workshops at the yard, with several more on the way. By the end of Project Jupiter, ASRY will be a 'one-stop-shop' for Owners, due to being the leader in Onsite Specialist Contractors in the Middle East."

ASRY already accommodates 33 Specialist Contractors, including] names such as Alfa Lavel, Wartsila, Blohm+Voss, Harris PYE, Goltens, and more. As Project Jupiter continues, 2014 will see several more global names take a permanent and significant presence in the yard. New agreements are imminent with more reputed OEM's. In Q1:

- ABB Industries opened its workshop in ASRY to provide onsite international factory warranties to all service jobs done at ASRY, including dedicated machines and engineers at a workstation within the shipyard, and access to its worldwide Service Network.
- SOLAS signed an agreement which will see a 2,000-sq.-m. Service Center for Life Boats, Life Rafts and Fire Fighting & Life Saving Appliances in ASRY.
- Seven Seas' new $800,000 facility has two workshops, one for metal fabrication, producing HVAC and architectural items and another shop for carpentry, building high quality furniture and architectural items, predominantly for Offshore solutions.

Targeting the Navy Market

ASRY launched a new department dedicated to military projects called the Navy Defense and Industrial Projects (NDIP) Department. The specialized team, headed by Anthony Haile, formerly of the UK Royal Navy is expanding ASRY's experience in the defense sector to become one of ASRY's primary differentiators from other regional yards. The new move is aiming at capturing approximately 60% of the regional Naval market, up from approximately 45% currently.

ASRY Chief Executive explained, "Naval repair work requires a very specific skill set and unique standards, which we have built up over recent years. By focusing that knowledge into a specialized team, we can ensure Naval customers that we speak their language when it comes to marine repair. This move has already seen results, with a unique invitation to the UK Ministry of Defence to discuss future collaborations."

Bahrain is the host to two of the largest fleets in the region, the UK and US, as well as Bahrain's own naval resources, and ASRY has been the popular choice for their repair work with 60 vessels docking at the yard in the past five years. This number is set to increase dramatically over the next two years, as ASRY's invests heavily, including the embedding of a new MAN-Diesel workshop on-site as an Original Equipment Manufacturer. This move alone is attracting US attention as its fleet primarily use MAN-Diesel engines. Meanwhile further negotiations are under way with the local Bahrain Navy for a more comprehensive ongoing relationship.

ASRY's recent Naval credentials have been growing in stature and gaining recognition. An ongoing project in Saudi Arabia has seen ASRY assist the BAE Systems Mid Life Update (MLU) of the Royal Saudi Naval Force fleet, undertaking 80% of the refit work with an ASRY team of approximately 60 men. ASRY also has a Forward Support Team based in Mina Salman port in Bahrain assisting with waterfront naval projects and maintenance support. Also, as part of its customization to particular Naval repair sensitivities, ASRY now operates the authorized access pass system developed by the Ministry of Defense Saudi Armed Forces Projects team which ensures maximum confidentiality and risk management for its people working within these vessels.

Above: Nils Kristian Berge, ASRY Chief Executive, cutting ribbon at ABB Opening.

Left: RSNF's HMS Al-Shaqra (422) - ASRY assists BAE in Midlife Update.

Navantia banks on the future

It is no secret that the Spanish shipbuilding sector has hit on hard times, particularly in the big ship sector where much of the commercial business has evolved to lower cost manufacturers in the Far East. But considering that Navantia has a 300-year history, the current downturn is put in perspective. While Navantia is not without challenges, it has the aforementioned experience and a military backlog to lean on. Navantia is engaged in the design and manufacture of Integrated Platform Management Systems, Fire Control Systems, Command and Control systems, Propulsion Plants and through life support for all its products. Even though its main line of activity is in the naval field, Navantia designs and manufactures systems for the Army and the Air Force as well. Navantia has strategically situated produc-

Navantia has counted on navy business to sustain itself in recent years, building ships such as this LHD.

tion centers in Ferrol Estuary, Cartagena shipyard and Bay of Cádiz, specialized in New Constructions, as well as Ship Repairs in the three areas. It has experience building the most technologically advanced ships like frigates, amphibious ships, patrol vessels, and submarines. In the last years, it has supplied ships for five different navies: Norway, Australia, Spain, India and Venezuela. It has also been selected in Turkey as the designer for the LPD program.

Navantia has a ship repair line of activity that goes from regular repairs to refurbishment programs, including conversions. The company has the facilities and know how for complex repairs comprising LNG'S and Cruisers. It has Fleet Maintenance Agreements with several big ship owners. Important products and projects include:

- **F-100 frigates**: In the last decade, it has built 10 frigates for the Spanish Navy and Royal Norwegian Navy and currently is providing design and technical assistance to the Royal Australian Navy for the construction of 3 AWD destroyers.
- **LHD ships**: It has built one unit for the Spanish Navy, two units for the Royal Australian Navy and has been selected to design two units for the Turkish Navy.
- **OPV's**: It has built 12 units for the Spanish and Venezuelan Navies and has been contracted to build two more for the Spanish Navy.
- **S-80 submarines**: Currently building four units for the Spanish Navy.
- **Replenishment Ships**: It has built three units for the Spanish Navy.

Energy Markets Buoy U.S. Shipbuilding

Proliferation of energy related transport continues to drive commercial U.S. Shipbuilding

By Maritime Reporter Staff

As the United States aims towards energy independence by the end of this decade, domestic shipyards and vessels owners are reaping rewards from this most unexpected turn of events.

Hydraulic Fracturing, or fracking, has been the main (and well publicized) culprit in the rapid turn of events. While the proliferation of gas has been widely known for years, the presence of oil, in quantity, was a pleasant surprise that has set domestic operators on a tear to devise new means to deliver the tools and materials needed for fracking operations, and to move product to market more efficiently than the present method of road and rail. But energy is not the only story, as U.S. marine vessel operators have invested in fleets to adopt new technologies and switching to cleaner burning engines and fuels to meet emerging, strict regulations. Following is a recap of some of the more notable recent events in the U.S. maritime market.

McAllister Towing marks its 150th anniversary this year, and the company's fleet includes more than 75 tugs serving the U.S. East Coast from Maine down to Puerto Rico. McAllister's business is multi-dimensional, from traditional ship docking to harbor and coastal towing and bulk operations. It also owns the Bridgeport & Port Jefferson Steamboat Co., a business which runs passenger/car ferries between Connecticut and New York. Fourth-generation Captain Brian A. McAllister worked his way up on the company's vessels and has been at the helm since 1974. Two years ago on his 80th birthday, Captain Brian promoted the fifth generation, his sons Buckley and Eric, and today the company is led by Chairman Brian McAllister, President Buckley McAllister and COO Eric McAllister. This year, McAllister welcomes three new-built Z-drive or azimuth thruster tugs, making one third of its fleet modern Z-drive tractor tugs. The Buckley McAllister, a 5,150-hp tractor tug built by Senesco Marine in Rhode Island, was launched in June and is based at McAllister's Providence site. Buckley's sister vessel, the Eric McAllister, was to delivered in July, and this fall McAllister plans to launch the Tate McAllister, a 6,000-hp tractor under construction at Washburn Doughty in Maine.

Edison Chouest Offshore, based in Cut Off, La., got its start in 1960 when founder Edison bought a 65-ft. steel-hulled shrimp boat and hauled supplies to an offshore rig. The family-run firm swelled into a ship construction and oilfield services leader, with more than 7,000 employees worldwide. ECO's fleet now exceeds 250 specialized offshore service and support vessels.

At the helm is president and CEO Gary Chouest, the son of Edison who passed away in 2008. Its presence in the shipbuilding sector has grown since it built North American Shipbuilding in Larose, La., in 1974. In 1996 Chouest affiliate North American Fabricators opened in Houma, La, and then affiliates Gulfship in Mississippi and Navship in Navegantes, Brazil opened. In the late 1990s, Chouest built two C-port facilities at Port Fourchon, La. to transfer cargo from deepwater vessels. Last year, the company said its orderbooks included 40 newbuilds at its U.S. Gulf affiliate yards and its Brazilian and Polish affiliates. Among them were 17 diesel-electric, 312-ft. platform supply vessels, with options for another 20. The company said it was producing four subsea construction vessels for Gulf of Mexico service. The new-builds included a refueling vessel, a multi-purpose construction supply vessel, a diesel-electric well stimulation boat and seven fast supply vessels. Chouest's Navship in Brazil, its largest affiliate with more than 1,600 employees, has been building diesel-electric PSVs and anchor handlers.

Crowley Maritime Corp. said that the third of four tugboats in the Ocean-class

McAllister Towing marks its 150th anniversary this year, and the company's fleet includes more than 75 tugs serving the U.S. East Coast from Maine down to Puerto Rico. Pictured are Buckley McAllister, President; Brian McAllister, Chairman; and Eric McAllister, Chief Operating Officer.

The U.S. Coast Guard (USCG) awarded a $255 million contract option to Bollinger Shipyards of Lockport, La., July 23, 2014 for the production of six more Sentinel-Class FRCs, bringing the total number of FRCs under contract with Bollinger to 30, with a current contract value of $1.4 billion.

series, Ocean Sky, has been christened in Houston, which formally welcomes the third dynamic positioning (DP) tugboat to the company's expanded ocean towing fleet. The Ocean Sky, which features DP2 technology, is part of a feature-rich, four-vessel family of tugs suited to work with Crowley's new 455 series high-deck strength barges, which measure 400 x 105 ft. All four tugboats are designed to have a minimum bollard pull of 150 metric tons and a range of approximately 12,600 nm at 15 knots free running. They are outfitted with twin-screw, controllable-pitch propellers in nozzles and high lift rudders for a combination of performance and fuel economy.

Bollinger Shipyards, Inc., Lockport, La., recently won a contract for six additional USCG Sentinel Class Fast Response Cutters (FRCs). The U.S. Coast Guard (USCG) awarded a $255 million contract option to Bollinger Shipyards of Lockport, La., July 23, 2014 for the production of six more Sentinel-Class FRCs, bringing the total number of FRCs under contract with Bollinger to 30, with a current contract value of $1.4 billion. The FRCs are scheduled to be delivered in 2017. In June 2014, Bollinger Shipyards delivered the USCGC Raymond Evans, the 10th FRC to the USCG in Key West, Fla. The Sentinel-class is replacing the Coast Guard's Island-class 110-ft. patrol boat. The FRC uses an in-service parent craft design based on the Damen Stan Patrol 4708. It can operate at speeds over 28 knots and is armed with one stabilized, remotely-operated 25mm chain gun and four crew-served .50 caliber machine guns.

Eastern Shipbuilding said that Harvey Gulf International Marine, Inc. (HGIM) and Eastern Shipbuilding Group, Inc. (ESG) entered into a contract to construct a new Robert Allan, Ltd. (RAL) RAmpage 6400 Multipurpose Field Support Vessel (MPFSV) at Eastern's Panama City, Florida facilities.

The RAL design is designated RAmpage 6400 and Eastern Hull No. 234; the vessel will begin a 10-year charter when delivered in April, 2016. Harvey Gulf is Eastern's long term offshore vessel client; now contracting its 14th offshore vessel over the past 13 years. The RAmpage 6400 (MPFSV) will measure 212 x x 59 x 25.6 ft., power by a pair of GE Marine 12V250MDC IMO II, EPA Tier 4i marine propulsion diesel engines

(Photo: Crowley Maritime)

Jennifer Legg, Crowley's assistant treasurer and vessel sponsor, breaks the ceremonial bottle of champagne across the hull of the Ocean Sky the third dynamic positioning (DP) tugboat to the company's expanded ocean towing fleet.

Photo courtesy of New Generation Shipbuilding

Built by New Generation Shipyard in Houm, La., he Lisa Gail Strafuss carries the well know Blessey Marine stack logo and is well sized and fitted out for pushing fuel barges in both the canals along the Gulf of Mexico and the Mississippi River system. A pair of grid-cooled Cummins K38-M main engines provides main power.

Photo: Bay Shipbuilding

Bay Shipbuilding Company (BSC) of Sturgeon Bay, Wis., a subsidiary of Fincantieri Marine Group (FMG), will keep its workers busy as it has been awarded a contract to build two 155,000-barrel capacity barges and two 6,000 HP tugs for Kirby Corporation.

(4,694 hp each) for a total installed power of 9,384 BHP.

Metal Shark has commenced operations at its new shipyard, where the first of its recently announced Endurance-class catamarans is now in production. In January, Metal Shark acquired a 25-acre waterfront tract situated on the Charenton Bypass Canal in Franklin, La., and announced plans to develop the new property into a facility to support its planned aluminum and steel shipbuilding efforts for vessels up to 250-ft. long. Six months later, the new facility is operational and production is underway.

"We're booked well into 2015 with new 45-, 55-, and 75-ft. pilot boats multiuse port utility boats, and dive support vessels, so we've been working around the clock to bring our new Franklin yard online," said Christopher Allard, Metal Shark president. The first boat to take shape at the new yard is a 75 x 22-ft. aluminum catamaran-hulled Metal Shark Endurance-class vessel built for a Louisiana port operator. Soon, work will begin on a second 75-ft. Endurance and two 55-ft. versions of the company's Defiant-class monohull pilot boats as Metal Shark ramps up its operations at the new facility.

Horizon Shipbuilding of Bayou La Batre, Ala., delivered the fourth in a series of 74-ft. towboats to Canal Barge Company. Jane Merrick is 74 ft. long with a 32.5-ft. beam and an 8.5-ft. draft. Designed by Marine Design, Inc. of Gulf Breeze, Fla., the vessel is capable of pushing fully loaded fuel barges at 10 knots. Its 2000 hp is provided by Cummins K38M, tier II 12-cylinder marine propulsion engines, and drives 74-in. Kahlenberg propellers through Reintjes WAF 562 reduction gears.

Offshore Inland Marine & Oilfield Services Inc. (OIMO), which provides in Topside and Riding Crew repair services, said it expanded its facilities and services at the Port of Pensacola. This phase of planned expansions will include a lease of 40,000 square foot manufacturing space to support subsea and marine related businesses. This expansion is in sync with the Pensacola Port Advisory Committees' recommendation to the mayor that offshore/subsea business development be the focus of Port asset usage. This approach provides a catalyst for increased economic growth in downtown Pensacola. Through this public/private development project enhanced capabilities are added thereby increasing Port attractiveness to offshore service companies. "As OIMO continues to build reputation in dockside service offering, it is important to continue to meet increased expectations for one-stop service delivery," said Robin Roberts, OIMO's Founder and President. "This expansion is a major step in accomplishing the goal of building the Port of Pensacola into a major Gulf of

Austal USA Launches LCS 8

Photo: Austal

Austal USA completed the launch of the future USS Montgomery (LCS 8). This vessel is the second of ten 127-meter Independence-variant LCS class ships Austal has been contracted to build for the U.S. Navy as prime contractor subsequent to a $3.5 billion block buy in 2010. "The LCS program continues to progress very well as we continue to see marked improvement in performance ship to ship," said Craig Perciavalle, Austal USA President. With the assistance of Berard Transportation and BAE Systems' Southeast Shipyard, the launch of Montgomery was conducted in a multi-step process which involved lifting the entire 1,600-metric-ton ship almost three feet in the air, moving it approximately 400 ft. onto a moored deck barge adjacent to the assembly bay, then transferring the LCS to a floating dry dock, BAE's Drydock Alabama. The floating dry dock was submerged with Montgomery entering the water for the first time. The ship is now moored in the Mobile River in front of Austal USA's facility, where it will undergo final outfitting and activation before sea trials and delivery to the Navy.

Mexico Offshore & Subsea Support Services Center."

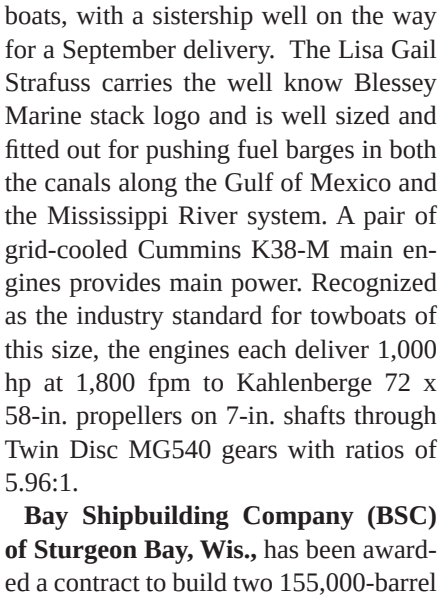
With a several vessels delivered, from pushboats to OSVs, Joe Gregory's **New Generation Shipyard** in Houma Louisiana, is now a well-recognized shipyard. Early this summer, the yard delivered one of its signature 72 x 30-ft. pushboats, with a sistership well on the way for a September delivery. The Lisa Gail Strafuss carries the well know Blessey Marine stack logo and is well sized and fitted out for pushing fuel barges in both the canals along the Gulf of Mexico and the Mississippi River system. A pair of grid-cooled Cummins K38-M main engines provides main power. Recognized as the industry standard for towboats of this size, the engines each deliver 1,000 hp at 1,800 fpm to Kahlenberge 72 x 58-in. propellers on 7-in. shafts through Twin Disc MG540 gears with ratios of 5.96:1.

Bay Shipbuilding Company (BSC) of Sturgeon Bay, Wis., has been awarded a contract to build two 155,000-barrel capacity barges and two 6,000 HP tugs for Kirby Corporation. The vessels are to be operated as Articulated Tug-Barge (ATB) units and will haul petroleum and chemical products domestically. The first ATB unit is scheduled for delivery in the Fall of 2016 and the second unit will be delivered in Summer of 2017.

Kvichak Marine Industries, Inc. recently delivered a multi-mission 66-ft. all-aluminum Shallow Draft Crab and Salmon Tender to the Norton Sound Economic Development Corporation (NSEDC).

Designed by Kvichak Marine to the mission specifications of NSEDC, the 66 x 25-ft. vessel is intended for very shallow draft crab and salmon tendering operations in the Norton Sound region, and will draw just 4.5 ft. when fully loaded. The vessel is powered by twin Cummins QSM11 marine diesel engines each rated for 450 bhp at 2,100 rpm and coupled to ZF 360 transmissions driving NiBrAl 4-blade propellers. The Paul C. Johnson is the first of its kind tender vessel built to classification society rules applicable to tender vessels of this type and holds a Class Certificate per RINA.

Bouchard Transportation Co., Inc., recently announced the next step in its ongoing fleet expansion with the construction of two 6000-hp ATB tugs. These newbuilds, the M/V Bouchard Boys and the M/V Evening Light, will be equipped with Intercon Coupler Systems and constructed by **VT Halter Marine, Inc.** Measuring 130 x 38 x 22 ft., these 6,000-hp Twin Screw ATB Tugs will be classed by ABS as XA1 Ocean Towing, Dual Mode ATB, USCG Subchapter C, both will be built with Tier III engines and Lufkin gears. With the addition of these two new tugs, Bouchard's fleet will be equipped with Intercon from 80,000 bbls to 250,000 bbls. The new tugs will be married up to two existing Bouchard barges.



Felipe Lamego, President & CEO of DeepFlex, at the announcement of the deal between DeepFlex, Offshore Inland, and the Port of Pensacola.

Frank(ly) Speaking

The Portland yard is where it all started for Frank Foti & Vigor Industrial, with a rendering of how it will look with the new floating drydock. Right is Foti pictured right in his office

Frank Foti of Vigor Industrial has steadily embarked on a consolidation of the Pacific Northwest ship construction and repair industry. Starting in Portland in 1995 with about 50 employees, the ubiquitous owner of Vigor has built his business today to more than 2,000 employees in an ever-widening industrial group. During a recent visit to Seattle, he shared insights on his company and the market.

By Greg Trauthwein

> "My personal philosophy is I have to do two things: make money and make a difference. If you are doing one or the other it's not enough for me."
>
> Frank Foti, CEO and Owner, Vigor Industrial

"Vigor is a diversified marine and industrial fabricator and it is a ship repair specialist," is how Frank Foti, the owner of Vigor Industrial for nearly 20 years, concisely describes his company. "You're in a shipyard (Vigor Seattle) where there's a Navy destroyer, a shipyard that is building and repairing barges; and a shipyard that is building and repairing ferries."

The story of Vigor's rapid ascension as a driving force in the Pacific Northwest ship construction and repair market is an intriguing one, and one fairly well recorded as Foti has an obvious ease with the media. But the story of Vigor almost never was, as early in his life Foti was embarked on a career in the telecommunications industry. But then his father, who owned a small construction company in Cleveland, became terminally ill and his dying wish was that Foti would come in to run the family business, which Foti reluctantly agreed.

"I was a typical high school kid who grew up one way, his father grew up another way," said Foti. "I used to turn my nose down to people who got dirty for a living, then I fell in love with people who get dirty for a living when I realized that there was more honesty, more truth out on a scaffolding than there was in the offices that I had spent time in. So my career took a turn where I became a business owner for industrial work. I didn't know it was going to go there."

Spend five minutes with Foti and it is apparent he's not remiss to share his opinion. And while he talks straight and fast, it becomes instantaneously clear that it is not about him. In fact, far from it.

"You see in my office that I don't have a single picture of a ship; only people," said Foti. And he's right, as the office walls are filled with dozens of photos of Vigor workers, past and present, a daily reminder to Foti of what his business is about.

But while he acknowledges the value of the people under his employ, from the start he knew it was his job to build a company beyond the Portland shipyard, a company of sufficient geographic and capability depth and breadth to supply ample opportunity to attract and retain the best people.

"Portland is a destination resort for repair and fabrication, but it has no local market," said Foti. "Once we shrunk (after he took over the shipyard in 1995, just as the U.S. Navy was transitioning from the 600-ship

to the 300-ship navy) and figured out a way to survive on what our facility could offer, the only way for us to generate stable revenue was to go to where the work was; expansion was required."

And expand he did, with acquisitions as far north as Alaska and most recently the acquisition of Oregon Iron Works, a strategic buy which will launch Vigor into fabrication for industries outside of maritime. In total Vigor owns eight facilities, with all major facilities offering a mix of new construction and repair (except for the new Oregon facility, which is strictly fabrication).

Vigor has been a driver for consolidation of maritime assets in the Pacific Northwest, helping to spearhead what some term a resurgence of maritime activity in the region. "Our consolidation was so that we could attain critical mass so that we could be a large enough company to effectively train, bring in good leaders, provide continuous employment," Foti said. "That necessity is mother of much creativity."

"Resurgence is an interesting word, because in a sense consolidation has helped to create the resurgence," said Foti. "The industry shrank, and now I think you see healthier companies that are poised for growth. There are some solid companies that have always been solid. You have a really great shipyard out here in Dakota Creek that has a reputation well past the Northwest. You have a builder of small boats for the Coast Guard and other commercial owners called Kvichak Marine. These are strong builders that have their own profile outside of the Northwest."

While Vigor's Navy work has dwindled, it keeps busy with a mix of commercial and government work (Military Sealift Command); a mix of new construction and repair. "Some level of consolidation combined with a readying for potential work in the Beaufort and Chukchi Sea with Alaska O&G exploration, and I think you'll see continued resurgence around the construction of fisher/processor boats for the Alaskan fishing trade," said Foti.

The New Floating Drydock

Early in 2013 Vigor Industrial reached an agreement with Daoda Marine Heavy Industry Company (DDHI) to purchase a new floating drydock for $40 million. At 960 ft. long, with an inside width of 186 ft. and a lifting capacity of 80,000 long tons, it is touted to be the largest floating drydock in the United States.

While the drydock hit some delays (when originally announced the anticipated delivery was March 2014, but it will arrive on the West Coast later this month) when it does arrive there is business lined up and waiting.

The new drydock, set to be stationed in Portland, will be 300 feet longer than the largest drydock Vigor currently owns, and it will allow Vigor to service the incoming generation of the U.S. Navy's Military Sealift Command (MSC) dry cargo/ammunition ships, which are replacing some smaller MSC ammunition, combat stores and fuel ships. The drydock will be large enough to service private vessels including post-Panamax cargo ships and cruise ships. The increased capacity will also help Vigor meet growing demand from the Arctic as oil and gas exploration and other ship operators take advantage of longer ice-free summers.

Need a Lift?

Marine Travelift builds boat hoists, self-propelled transporters, and marine forklifts

By Edward Lundquist

Not every ship repair facility has a drydock or marine railway. But thanks to a Sturgeon Bay, Wis.-based company, shipbuilders and repair yards from small to large can get a real lift.

Marine Travelift builds boat hoists, self-propelled transporters, and marine forklifts, with more than 3,500 units delivered worldwide, and can be found at waterfronts all around the world.

"Our boat hoists range from 15 ton all the way up to 1,000 ton capacity," said Jason Johnson, North American sales manager. "Marine Travellift has been involved with shipyards since the 1980s. It's a market that is growing in popularity for our products," said Johnson. "Being able to safely lift vessels to and from the water in a relatively quick manner as opposed to traditional drydocks is very attractive to our shipyard clients."

Johnson says there are real efficiencies. "It's possible to move vessels into protected area off the waterfront, so workers can get around a vessel to work on it, or moved to an area where there is environmental protection for sandblasting."

The largest models can handle 1,000 ton lifts. Johnson says the Colonna's Shipyard in Norfolk, Virginia, is being used for projects up to 1,000 metric tons. That makes the lift an ideal choice for tugs, work boats, ferries, offshore supply and crew boats, and barges.

Colonna's has used the 1000 C to haul small Navy combatants such as the USS Monsoon (PC-4) and USS Squall (PC-7).

"Using the Marine Travelift hoist saved the U.S. Navy and the taxpayers several hundred thousand dollars of drydock fees, since we could berth the ship on land for the eight months it was out of the water," said Richard Sobocinski, vice president of contracts for Colonna's Shipyard. "Plus, one of the more positive aspects of using the machine is that environmental issues inherent in ship repair can be more easily controlled and managed on land."

In addition to retrieving vessels from the water for maintenance and repair, Johnson says the lifts can also be used to for fabrication and handling of caissons and specialty items.

"The units are self-propelled with rubber tires, and are operated remotely using a wireless transmitter, which allows the operator to walk anywhere around the machine," Johnson says. "The operator can position himself at a preferred vantage point. The controls are laid out in a manner that is very intuitive to an operator."

"We're engaged in a partnership with the client right from the start to understand where they see where their business is going currently and in future. We help them determine the best model for their requirement," he says. "This is a purchase that will last for a number of years. We want to look forward with the client."

Johnson says the company has many repeat customers. Newport Shipyard in Rhode Island, for example, has three units in operation.

"You can haul a vessel out of the water and hang it for hull inspection, or to change out a prop, without setting it down" Johnson says. "It saves on labor, especially if the vessel going back in in a short amount of time."

In fact, Colonna's Shipyard was able to relocate its blasting and painting operations away from the open water to land basins where the yard can collect and process waste water before discharging it.

The articulated pivot trunnion allows for the frame to flex under uneven terrain without causing structural damage or risking the safety of the load. Four-wheel steering provides a tight turning radius for precision handling of boats in limited spaces. "And it requires no greasing," Johnson says.

"We deliver the unit delivered in pieces by truck or open top containers. We provide a factory service technician from Sturgeon Bay to supervise erection of the machine. It connects together with bolting flanges. Assembly is quite efficient and quick," Johnson says. "We also provide training to the customer."

"The market is trending up," Johnson says. "What we're hearing from our customers is that our product provides an opportunity to make their business more efficient."

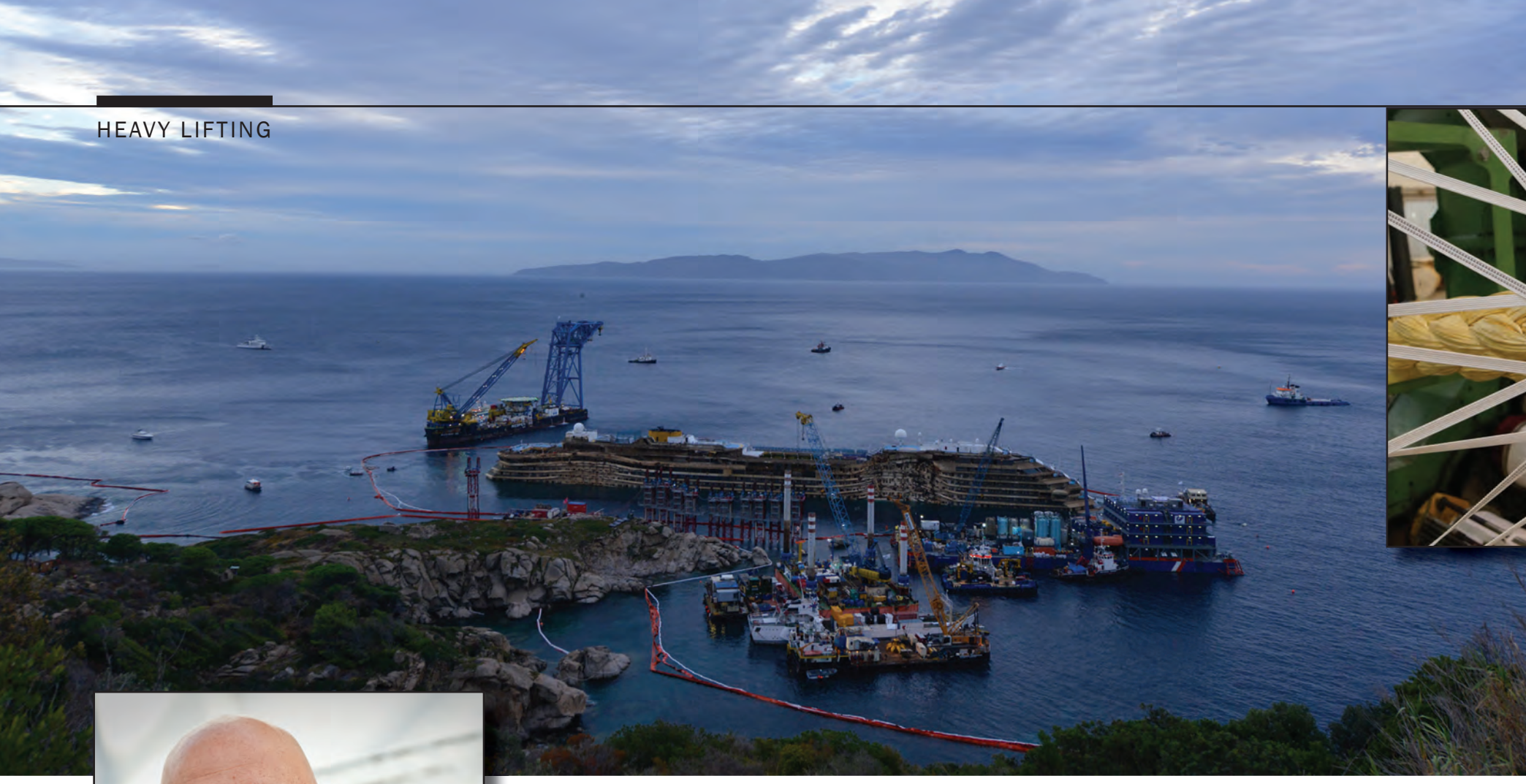
Dockside Load Testing with Unique Seaflex

Static load testing is an essential part of many engineering, building and manufacturing businesses – and the shipping, marine and offshore industry is no exception. Water filled weights (also known as ballast bags) provide a flexible method for load testing. Test weights must be sufficiently heavy to ascertain the maximum load of an object, but they should also be reusable and safe to deploy in a test environment. Where there is easy access to a plentiful supply of water, water-filled weights can provide a quick, efficient means to undertake such testing. When empty the bags weigh a small fraction of the filled weight (typically less than 1% of their capacity) – and can be packed into transit crates, making them easy to deploy and pack down again for storage between jobs. In use they can be partially filled for any exacting requirements, or used in combination to achieve larger test capacities.

Once filled with water, these bags will generally weigh anywhere from 1,000 Kg to 50,000 Kg. Larger sizes are possible, but beyond 50t the handling benefits start to diminish. Objects can be tested in various ways: for example, test weights might be attached to the center of a steel arch to ascertain load capacity before being (vertically) affixed to one end to test tensile strength. Understanding how components, parts or materials behave under extreme loads in different positions can help engineers create safer and more powerful systems.

Although capable of being used almost anywhere, water-filled weights are often deployed in docks to ensure that parts can be tested without fear of causing structural damage (failed components and the weights attached to them can simply fall into the water). To ensure that materials are tested accurately, the risk of cable failure is reduced by the inclusion of telemetry dual-load shackles and tensile load cells. There are no globally-recognized standards governing this field of work, but the nearest are the 051 Guidelines as developed and published by the Lifting Equipment Engineers Association (LEEA) – a U.K. body which is gaining increased worldwide recognition. Its 051 Guidelines cover the design, inspection and use of such bags as test weights within the offshore and marine industries – and focuses in particular upon subjects such as component suitability and traceability, manufacturing test regimes, and the desirability of having drop-tested bags of each size to prove that they are capable of withstanding a peak load of 6x their capacity, or working load limit. Unique Maritime Group's Unique Seaflex is at the forefront of being able to demonstrate compliance to these LEEA guidelines. Working within the limitations of the largest test rig it could find, all of its water bags have proven themselves capable of withstanding overloads many times in excess of their working load limits – with Type Test Certification and Product Design Assessment Certification from ABS by way of independent verification of the integrity of their designs.

www.uniquegroup.com



The successful Costa Concordia Parbuckling project. Ropes made with Dyneema help Titan Salvage nd Mico-peri on this historic salvage operation.

Talking Heavy Lifing with Dyneema president

Gerard de Reuver

If your knowledge is scant on Ultra High Molecular Weight PolyEthylene fiber and its impact on heavy lifting, read on and Dyneema president Gerard de Reuver will school you.

By Greg Trauthwein

What is DSM Dyneema?

DSM Dyneema is the inventor and manufacturer of Ultra High Molecular Weight PolyEthylene (UHMWPE) fiber branded as Dyneema, the world's strongest fiber.

In reading up on DSM Dyneema previous to this interview, the word "Innovation" comes through time and again: Please describe for our readers the innovation that DSM Dyneema delivers.

Innovation is an important part of why I'm with this company. If you talk about this product with somebody who knows nothing about the product itself, everybody gets excited; because the beautiful thing is, the Dyneema product triggers all kinds of new application thoughts, ideas and people get excited about that. And if they get excited, they have energy and they get positive, and that's what you have in this company.

Innovation is often described as driven by societal or industry needs. Yet it is people who make the difference. With technology as the catalyst, DSM Dyneema encourages its people to think big – and be willing to move from existing paths and make new concepts become reality. And they can only do so in an environment that allows them to step out of their comfort zone, make mistakes and learn from them. Examples of innovation include:

- The breakthrough of **Dyneema Max Technology** which redefines the material's already exceptional performance in deep sea mooring, combining weight and strength advantages with a unique resistance to creep. However, it also brings added value to lines for the offshore, maritime & sailing industry;
- **ShoreTension**, a revolutionary vessel mooring system, is helping the marine industry to address the global challenges of energy conservation, improving ships' safety and the continuous need to reduce down-time of available terminals;
- **Stronger fish barrier nets** with Dyneema. In the United States, Pacific Netting Products Incorporated (PNP) is helping power generators to reduce costs and increase successful fish migration with barrier nets made with advanced Dyneema fiber.

How is DSM Dyneema investing in innovation today?

The DSM Dyneema science team is encouraged to spend 10-20% of its time on 'blue-sky' projects and developments, in addition to specific projects. Our Open Innovation challenge goes one step further; we invite anyone to share ideas and experiences with us. Also, we are currently developing new technology innovations in the renewable energy space of floating offshore wind, in a consortium of development partners led by the Glosten Associates, where DM 20 from Dyneema Max Technology is an en-

Dextron 12 Plus ropes made with Dyneema Fiber

These ropes were specifically chosen for the Concordia salvage project because during the installation process, the ropes with Dyneema did indeed not drag along the seabed as steel ropes would have. Nevertheless, since they are in constant contact along much of their length with the hull of the ship, they need surface protection, which is why Dextron 12 Plus ropes with patented protective jackets from leading Norwegian rope maker Offshore and Trawl Supply (OTS) were chosen.

abling technology in the design and construction of the tendon mooring of tension leg platform.

We understand that – in cooperation with others – ShoreTension BV, with support from DSM Dyneema, has introduced a "revolutionary" ShoreTension Mooring Solution.

ShoreTension, a revolutionary vessel mooring system developed by the Royal Dutch Boatsmen Association, is helping the marine industry to address the global challenges of energy conservation, improving ships' safety and the continuous need to reduce down-time of available terminals. The link between the ShoreTension system and the moored vessel is provided by ropes made with Dyneema SK78 fiber from DSM to ensure permanent tension, even in extreme conditions.

ShoreTension is a stand-alone hydraulically controlled mooring system, designed to absorb the energy of the moving ship in a gust of wind and store this internally while paying out the mooring lines. When the peak loads are over, the system heaves in the lines with the energy stored, returning to its initial position. The system does not require any external energy, thus providing an effective and sustainable mooring solution. To demonstrate its reliability, the ShoreTension system has undergone extensive tests before and after it was introduced to a number of end-users at various ports around the world, such as Rotterdam, Sines and Cotonou. These were all completed successfully.

As it does not require any external energy, a sustainable solution is provided. By reducing the loads and providing high pre-tension in the mooring lines, downtime of the terminal can be reduced significantly even in extreme weather conditions at exposed terminals. In addition to guaranteeing vessel safety by reducing or even eliminating problems of swell and compensating suction caused by passing

ships, the system delivers added efficiency by accelerating turnaround time and improving efficiency on the quay side.

Where is it installed and in use today?

The ShoreTension system has undergone extensive tests after it was introduced to a number of end-users at various ports around the world, such as Rotterdam (The Netherlands), Sines (Portugal) and Cotonou (Benin). Tests are ongoing in Australia and Chile. The successful completion of these projects demonstrates the reliability of the system, which will definitely open up many new opportunities for ShoreTension B.V.

While we understand the weight and flotation characteristics of rope made with DSM Dyneema technology, historically penetration in the maritime and offshore market has been stunted by reliance on traditional product. How do you see the market today?

Risk adversity and Reliability are the key-words in this industry. This has obviously consequences with regards to the speed of penetration but also the advantage that if customers/end-users accept your solution, it will be a sustainable relationship. I feel that we are at a tipping point with the offshore market. In many other subsegments, like tugging and towing, we have been proving the advantages of Dyneema.

In your view, what have been the traditional

A four-way partnership between ShoreTension BV, Hoenderop BV, Gleistein Ropes and DSM Dyneema BV delivers revolutionary ShoreTension stand-alone vessel mooring system.

impediments to further penetration of the technologically advance products?

Qualification and Certification are the most time consuming aspects. Customers are recognizing the value of the Dyneema solutions so it is more a time issue than a technology acceptance problem.

What do you see as the driver for growth?

Strength, weight and sustainability of the solution will be the differentiating elements for growth in general and certainly in this area. Dyneema is well positioned in all three and will enable us to capture a big part of the offshore and maritime market opportunities both in replacement of traditional systems as in more demanding applications which lack a solution.

Where do you opportunities for growth?

We see opportunities especially in the BRIC countries (Brazil, Russia, India and China), but we are looking further too, at Turkey, Indonesia, and the ASEAN countries.

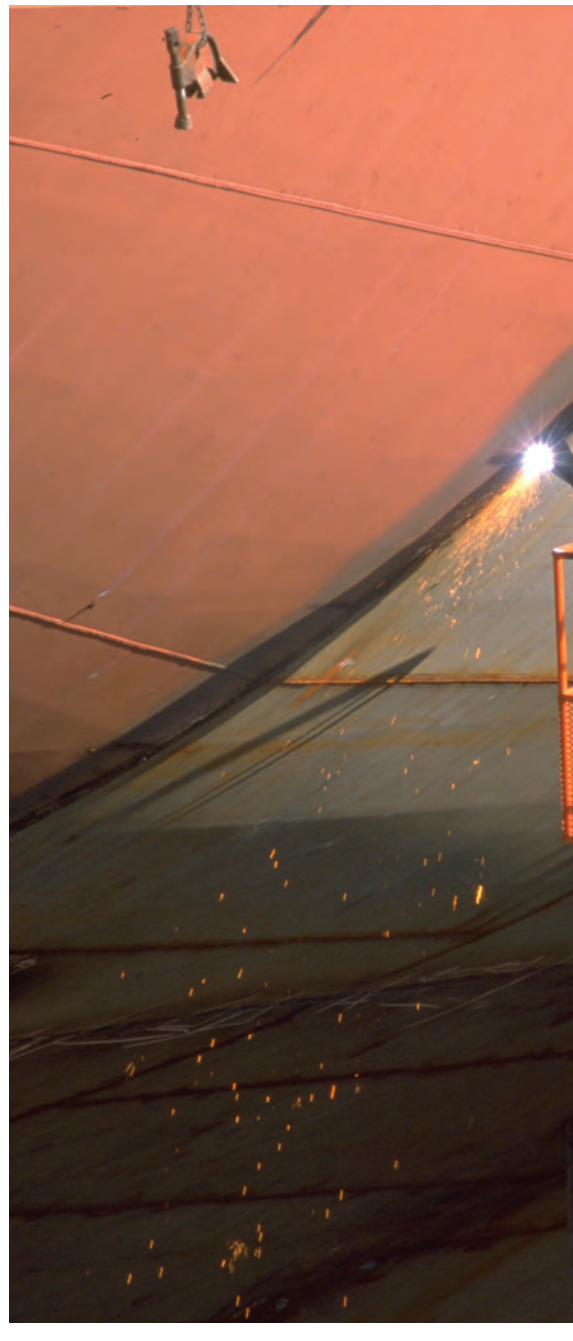
Lifting of FPSO loading turret.

The Lowdown on Lifting

BY JEFF FORD &
BRIAN BOECKMAN,
JLG INDUSTRIES, INC.

Telehandlers and aerial work platforms (AWPs) have long been staples of the construction industry, favored by contractors for their safety and efficiency when working at height. As the equipment evolves, these machines are becoming more versatile and moving into other industries, including the marine market. Telehandlers allow for flexibility in handling goods and materials, particularly in shipyards and shipyard warehouses, fabrication facilities and workshops, and AWPs provide a safe, efficient way to work at height in these same settings.

Telehandlers are material handling vehicles with telescoping booms that allow them to deliver materials to heights of 65 ft. or more. The reach and load capacities



separate these machines from forklifts, which rely on a vertical mast to move loads, and wheel loaders equipped with forks. Telehandlers can carry loads of 75,000 pounds or more, well above a typical shipyard load of 10,000 to 15,000 pounds. Compact telehandlers, as the name implies, have smaller dimensions than traditional telehandlers and are well suited to close quarters. They offer tight turning radii and low profiles for outstanding maneuverability in confined spaces, such as indoor shipbuilding and repair facilities or crowded warehouses. Despite their reduced size, compact telehandlers typically offer lift heights up to 18 ft., outreach up to 11 ft., and carrying capacities up to 5,500 pounds.

Telehandler Accessories Enhance Versatility

A variety of attachments that fit on the end of the telehandler boom enhance the versatility and performance of the machines. Fork carriages come in a variety of widths and can offer many degrees of freedom, including rotation and side tilt. The carriages can be equipped with numerous fork options to accommodate any size load. Truss booms offer a means to move suspended loads and heavy, bulky materials, including I-beams used in ship building.

Sheet material adapters enable operators to move large, flat materials, such as drywall or plywood. This accessory limits damage during transport and can be used with pallet or lumber forks and carriages to pick and place materials. Carriages come in a variety of widths and fork lengths to accommodate the dimensions of a load.

While AWPs are still the best way to move people to work at height, telehandler booms can also be outfitted with work platforms to lift people. Bucket attachments allow telehandlers to scoop and carry large volumes of loose materials or waste. To tackle larger tasks, a

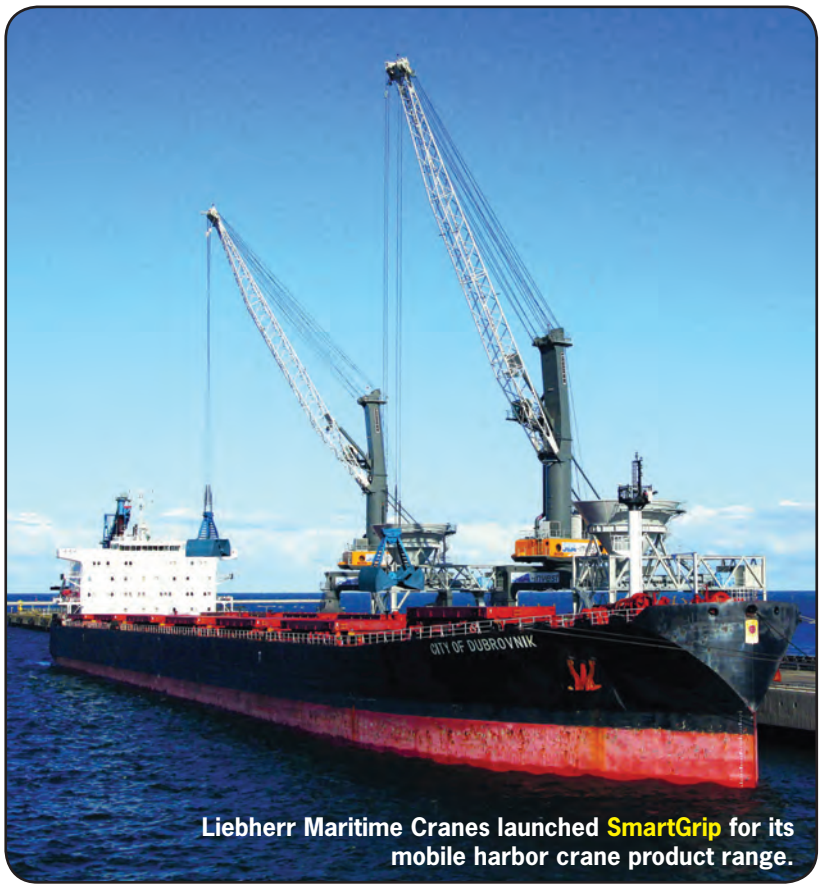
(Continued on page 105)

SmartGrip

A 'evolution' in bulk handling

Liebherr Maritime Cranes launched what it is calling a 'game-changing' technology: SmartGrip for its mobile harbor crane product range. This technology is designed to operate as an intelligent system which optimizes grab filling rates in a self-learning manner, aiming for better performance and zero overloads. SmartGrip's development is based on recent turnover analyses in various ports around the world, as data showed that, on average, only 70% of the grab capacity is used. There are many factors why the grab is not operated at full capacity, including suboptimal grabbing angle and varying material density. For crane operators the estimation of the material density and the right grabbing angle may turn out to be a real challenge. As a result, ports are faced with less turnover than expected.

SmartGrip is a solution designed to optimize grab filling rates. In a field study, Liebherr collected real data of different crane models which were equipped with a wide range of grabs to handle different materials. Additionally, numerous crane operators ensured a broad spectrum of skill-levels during data collection. Liebherr deduced the ideal grab filling model by means of data mining. In operation, the self-learning system automatically adjusts its behavior by recognizing bulk density, compression and granularity as well as current frame conditions like depth of impression or type of grab. Load cycle by load cycle, SmartGrip automatically optimizes filling to maximum capability taking grab size and outreach into account. Right from the second load cycle, SmartGrip ensures that the grab filling rate is above the average of 70%. Within a maximum of seven cycles the full capacity of the grab is utilized.



Liebherr Maritime Cranes launched SmartGrip for its mobile harbor crane product range.

Zero Overloads

Changing materials and varying density are main challenges for the crane operator in bulk operation. Furthermore, density also depends on depth of impression which means that even when working on the same hatch, handling situation may change. If the driver needs to fill the grab manually, he may overload the crane when pulling the lifting attachment out of sticky material. Frequent overloads lead to a notably shorter lifetime of the crane. Additionally, frequent overloads are also time-consuming as the crane is automatically switched off if there is too much pull on the grab. SmartGrip controls the filling of the grab to suit the load curve of the crane, theoretically leading to optimal crane utilization without overloading. Thus, SmartGrip also works as overload prevention system resulting in an extended lifetime of the crane, saving fuel and time.

Bulk material handling comprises a number of challenges, and to maximize productivity the grab has to be filled to the limit, which means the driver has to fine-tune grab filling by opening and closing the grab as well as hoisting and lowering. This is both stress for the operator and time-consuming.

With SmartGrip is activated Liebherr said that the operator can completely rely on the system for an accurate determination of the material density and optimal grabbing angle in a very short time. The automatic and optimized grab filling means less stress for the crane operator who can then focus more on other important issues like safety.

Achieved turnover depends on many issues, including available infrastructure, driver skills and materials handled. In view of the average grab filling rate of 70%, SmartGrip offers a potential of up to 30% more turnover. Additionally, turnover variance is significantly reduced, leading to more efficiency in operation. Field studies showed that even up to 40% turnover increase are realistic if the grab filling rate is below average. Additionally, SmartGrip partly closes the gap between high-skilled and less-skilled drivers, as some important parts of bulk handling are automatically optimized by the system.

Another feature of the system is the possibility to manually set target loads. If a crane operator needs to load a 40 tonnes capacity truck, for instance, he can advise SmartGrip to fill the grab with 40 tonnes.

In addition, SmartGrip can be retrofit to older Liebherr machines.

grapple bucket features a hydraulic grapple arm that clamps down to grab bulky materials and secure the load.

AWPs Move People and Materials

The job of AWPs is to safely place people and materials in hard-to-reach spaces that might otherwise be inaccessible. Their reach and capacity, particularly when there is a need for two workers with tools in the platform, allow these machines to facilitate a wide variety of work, such as welding, sandblasting and painting in ship building and maintenance. Shipyard operators in the market for an AWP will find a variety of options available to them with a variety of power sources, functions and reach capabilities. Smaller, more compact boom lifts are usually powered by rechargeable batteries. They operate quietly without any exhaust, making them the boom of choice for indoor applications, including metal fabrication and carpentry workshops and offices that are often part of a shipyard. Larger combustion-powered booms use gas or diesel fuel, offer platform heights as high as 185 ft., and lend themselves to outdoor applications.

AWPs also vary by configuration. Scissor lifts use a crisscross support to lift the work platform. These machines work well for applications that require access directly overhead, such as maintenance or repair. Telescopic booms use hydraulic cylinders to extend straight out from the base, like a telescope, and can rotate 360 degrees. Articulating boom lifts employ a joint or knuckle that enables the boom to bend and reach up, over, and sometimes even around obstacles. Like telescopic boom lifts, they rotate 360 degrees, but their horizontal reach is not as great. They tend to be more compact and can be electric- or combustion-powered.

A mast boom uses a jib to reach up and over obstacles, but this AWP can work in tighter spaces than an articulating boom. Mast booms lend themselves to shipyard warehouses, where they can be used to reach high shelving or change light bulbs and perform other maintenance tasks.

A Size for Every Job

AWPs are available in a variety of sizes. As is the case with compact telehandlers, low-level AWPs are becoming more popular. Personal and portable lift devices in heights up to 20 feet offer a safe alternative to ladders and scaffolding. To use a ladder correctly, a worker is required to maintain three points of contact. This leaves just one hand free to perform a task. Using a lift enables a worker to stand in a platform – safely tied off and surrounded by railing – with two free hands and space for tools and materials. Scaffolding is stationary, making it difficult to quickly move through a shipyard. In addition, scaffolding takes time to erect and tear down, which is time saved using an AWP.

At the other extreme, the largest AWPs can reach as high as 185 ft. (or 19 stories) and provide access to more than three million cubic feet of reachable space. By including a telescopic jib, the unit can extend and retract to provide additional reach, up-and-over capability, and the ability to telescope into and around ships in a variety of applications.

The versatility of both telehandlers and AWPs means maritime companies typically find multiple uses for the machines on ce they are onsite – uses that often go beyond the original reasons for bringing a machine to a shipyard. In the maritime industry, versatility translates to productivity. As important, selecting the right machine to work at height or move materials ensures crew safety. That will deliver the peace of mind that accompanies a job well done.

Brian Boeckman is the Global Product Director for telehandlers at JLG Industries, Inc., responsible for worldwide management of the company's full line of telehandling equipment, which is sold under the JLG, SkyTrak, and Deutz Fahr brands.

Jeff Ford is Global Product Director for aerial work platforms at JLG Industries, Inc., responsible for managing and growing the company's aerial work platform lines, working with the product development and product management teams.

Shipping Companies Must *Reduce Costs and Boost Efficiency*

By Jim Rhodes and Frank Soccoli

Edward Scott

Jim Watson

Michael Wilson

Executive Insights

ShippingINSIGHT is a conference that attracts an "A-List" of shipping and maritime executives to Stamford, Conn. There is a Keynote Speakers for each day of the conference, including: Edward Scott, COO, Excelerate Energy; Admiral James Watson, President, ABS-Americas – Fleet Optimization; and Michael Wilson, President, Laurin Maritime (Americas).

So what's keeping ship operators awake at night these days? Plenty, it seems. Sluggish recovery from a lingering worldwide recession, unsustainable debt loads, endemic overcapacity in most shipping trades, punishing freight rates, rising costs of fuel and regulatory compliance and a lingering sense that ships are not running as efficiently as they could. The last two topics – reducing fuel costs while complying with emission regulations and improving ship operating efficiency – will take center stage at **SHIPPINGInsight 2014, scheduled for Sept. 30 – Oct. 2 in Stamford, Conn.**

Fuel: Search for Alternatives

Let's start with the biggest headache – the inexorable rise in costs of fuel and compliance with new regulatory requirements. Fuel currently accounts for more than half of daily ship operating costs. That percentage will likely rise as the more stringent Emission Control Area (ECA) requirements for low-sulfur content come into force. Since Aug. 1, 2012, ships sailing within 200 nm of the U.S. coast have been required to burn fuel with a sulfur content of not more than one percent. While it is expected that supplies of compliant distillates will be more readily available when the more stringent 0.1 percent sulfur content requirement comes into effect Jan. 1, 2015, costs of fueling ships and complying with emission regulations will surely continue to rise.

It's hardly surprising that shipowners and shipmanagers are looking hard at ways to reduce fuel costs. A relatively minor improvement of just one or two percentage points can produce substantial savings on the bottom line. One option is switching over from diesel and distillate fuels to liquefied natural gas (LNG), which burns much cleaner and meets all current and projected ECA emission requirements. The movement to LNG is gaining momentum. There are currently more than $3 billion worth of LNG-powered ships on order in North American shipyards, according to a report recently released by the American Bureau of Shipping (ABS).

While LNG has its cheerleaders, there are plenty of skeptics, who point to the lack of infrastructure for delivering, storing and bunkering with LNG on a wide scale. So far, most of the LNG initiatives are for vessels such as ferries and offshore supply vessels operating out of fixed bases where bunkering infrastructure can be more easily implemented. It doesn't help that guidelines and regulations for LNG bunkering have not been issued by federal, state or local authorities, leading to confusion in the marketplace. Critics also note that LNG requires more storage space on ships, which means shorter times between bunkering and/or diminished cargo capacity, and that the capital costs of retrofitting an existing ship for LNG propulsion must be weighed against the high cost of installing scrubbers to meet the emission requirements. Costs of scrubber systems are moving downward and may provide an attractive alternative to LNG switchover, especially on existing ships.

To be sure, there are other alternative fuels besides LNG being proposed and tested. They include emulsified fuels (mix of petroleum fuels and water), which are said to burn cleaner and more efficiently, and methane-based fuels such as dimethyl ether (DME) which can be burned in existing diesel engines. DME has been gaining traction increasingly in the transportation industry, and most major U.S. long-haul truck builders have active DME development programs in place.

Given the timeliness of the topic, SHIPPINGInsight 2014 will include a full-day **Marine LNG Symposium** immediately preceding the two-day Fleet Optimization Conference, with an impressive lineup of speakers, moderators and panelists who will look at all aspects of the subject. The symposium will be kicked off by keynote speaker Edward Scott, COO of Excelerate Energy.

Efficiency: Better Data and More of It

One of the major inhibiting factors in achieving greater efficiencies in ship operations is the paucity of data flowing from ship to shore. How, for instance, can you improve fuel efficiency in real-time unless you can measure, record and analyze key performance indicators (KPIs) from the ship's onboard systems and sensors, and make adjustments as needed?

In other industrial sectors, "big data" has become a key element in managing and controlling assets. Increasingly, smart devices are "talking" with other smart devices, exchanging data without human intervention. The marketplace for machine-to-machine (M2M) connectivity is one of the fastest growing sectors in the world today. It's sometimes referred to as the "Internet of Things" (IOT) or as "telematics" (from the automatic transfer of telemetry from a remote device). Driven by demand for connectivity, the M2M sector is growing at an astonishing pace. Cisco, a market leader in M2M, predicts there will be 25 billion devices connected to the Internet in 2015 and 50 billion by 2020. The net value of the M2M market will be an estimated $14.4 trillion.

A primary driver of rapid growth in M2M is the abundant availability of high-bandwidth wireless connections. Therein lies the rub when it comes to ships, which spend their time far beyond the range of terrestrial high-speed wireless networks. The problem is the limited communication bandwidth available on maritime satellite channels – not to mention the extremely high costs of satellite airtime.

Happily, the next generation of satellites being placed into orbit by companies like Inmarsat, Iridium and ORBCOMM will be capable of much higher data rates, making it possible for smart devices to exchange more data at faster speeds – although at what cost remains to be seen.

In the last five years we have seen a significant rise in new starts-ups entering the maritime space offering automated ship to shore solutions combined with sophisticated data analytics to improve ship performance levels. We expect to see more in coming months.

If this subject interests you, we're happy to tell you there will be a special focus on smart systems and ship-shore data connectivity at the SHIPPINGInsight 2014 Fleet Optimization Conference in October. Panel sessions will look at designing and building efficient ships, fuel and propulsion management, ship performance and optimization, human capital management and fleet intelligence and optimization. For full conference details and to register to attend, visit: **www.shippinginsight.com**

ShippingINSIGHT 2014 Highlights

September 30 - October 2, 2014 ○ Stamford, Connecticut ○ www.shippinginsight.com

Marine LNG Symposium

Tuesday, September 30

Keynote Speaker: Edward Scott, COO, Excelerate Energy

Panel Session 1:

Navigating the Regulatory Environment

- *The latest legal framework that governs environmental regulations*
- *Understanding the U.S. Coast Guard rules and regulations that impact the shipping industry*
- *Learn how regulations are evolving and understand their impact on management decisions*

Moderators:

Angus Campbell, Managing Director, Bernhard Schulte Shipmanagement (UK)
Ravi Singh, Technical Director, Northern Fund Management America

Panel Session 2: LNG Bunkering

- *The latest challenges and advancements with LNG bunkering operations*
- *Learn about the different methodologies and technical aspects of LNG bunkering*
- *The industry experience with LNG and how results have impacted management decision making*

Moderators:

Johan Sperling, Vice President, Jensen Maritime/Crowley
Capt. Mark Lane, SVP – Operations, Excelerate Energy

Panel Session 3: LNG Infrastructure

- *The latest plans and timelines for shoreside terminals*
- *How LNG suppliers will address evolving requirements*
- *The LNG price outlook*
- *The risk and safety considerations of LNG*

Moderators:

Chris Charter, Operations, Navig8
Angus Campbell, Managing Director, Bernhard Schulte Shipmanagement (UK)

Panel Session 4: Designing for LNG

- *The designing considerations and implications when employing LNG as a fuel*
- *How engine designs have evolved to leverage the advantages of LNG*
- *The latest in LNG-based ship design driving cost reduction and efficiency*

Moderators:

William Nugent, VP Technical Service Group, OSG Ship Management
Capt. Karen Davis, Marine Assurance, ConocoPhillips
Robert Hall, Vice President Fleet Operations, Seabulk Tankers

Panel Session 5: LNG Industry Leaders Roundtable

Sponsored by Pace Global, A Siemens Business

- *Join an interactive roundtable with a group of distinguished industry leaders to ask questions and debate the latest LNG topics driving efficient ship operations*
- *Learn about the latest case studies in this evolving technology*
- *Improve your understanding of the challenges ahead and available solutions*

Roundtable Chairman:

Joseph Keefe, Editor, Maritime Professional

Panelists:

Mahinde Abeynaike, Managing Director, Bomin Linde LNG
Aziz Bamik, General Manager, GTT North America
Holt Bradshaw, Executive Director, Pace Global, A Siemens Business
Angus Campbell, Managing Director, Bernhard Schulte Shipmanagement (UK)
Margaret Doyle, Director, Maritime Simulation Institute
John Hatley, Vice President, Wärtsilä
Jonathan Webster, Vice President, Rolls-Royce

6:00 PM — 7:30 PM Networking Reception sponsored by utiliVisor, Registration & Exhibits

Fleet Optimization Conference Agenda:

Wednesday, October 1

Keynote Speaker:
Michael Wilson, President, Laurin Maritime (Americas)

Panel Session 1: Designing & Building Efficient Ships

- *The latest designs influencing ship performance*
- *Technology innovation addressed in the new market reality*
- *Obtain a shipyard perspective on building an efficient ship*

Moderators:

William Nugent, VP Technical Service Group, OSG Ship Mgt
John Nichols, Director Head of Operations Supramax, Clipper Bulk (US)
Johan Sperling, Vice President, Jensen/Crowley Maritime

Panel Session 2: Fuel & Propulsion Management

- *The latest challenges and advancements with the new generation of efficient engines*
- *The latest innovation in wireless fuel sensor technology employed to improve efficiency*

Moderators:

Robert Bullen, Fleet Manager, U.S.D. Flag Operations, Maersk Line Limited
Angus Campbell, Managing Director, Bernhard Schulte Shipmanagement (UK)
Mike Elbers, Technical Manager, Apex Bulk Carriers
Judy Gladson, Director Technical Division, Military Sealift Command

Panel Session 3: Ship Performance & Optimization

- *The latest in hull performance solutions that drive efficiency and reduce costs*
- *Employing power management for efficiency*

Moderators:

Capt. Harold Boyer, Director Operations, Heidmar
Anders Aasen, AVP Global Technical Services, RCCL
Mark Remijan, Operations Manager, APL Maritime
Rajnish Bahel, General Manager, Eagle Shipping

Panel Session 4: Human Capital Management

- *Learn how to employ the latest in simulation training to improve crew efficiency*
- *Recruiting methodologies you can employ to meet your crew staffing needs*

Moderators:

Joseph McKeown, Technical Director, V Ships (US)
Erny Otterspoor, VP & Technical Director, Roymar Ship Management
Robin van Wyngaarden, Operations Manager, Ultrabulk
Thomas Monteiro, Director, Marketing & Business Development, Bernhard Schulte Shipmanagement

6:00 PM — 8:00 PM Networking Reception sponsored by Faststream Recruitment Group & Exhibits

Thursday, October 2

Keynote Speaker: Admiral James Watson, President, ABS-Americas – Fleet Optimization
Guest Speaker: Richard Greiner, Partner, Moore Stephens – Ship Operating Costs: Trends & Outlook

Panel Session 5: Fleet Intelligence & Optimization

- *How to use fleet intelligence data to drive ship efficiency*
- *The latest in remote monitoring technology to improve ship operations*

Moderators:

Fred Finger, VP & GM, American Roll On Roll Off Carrier
Amit Datta, Commercial Ops Manager, Gemini Tankers
Philip Bannerman, Wilhelmsen Ship Management
Capt. Mark Jackson, Vice President of Technical Operations, Carnival Cruise Lines

Panel Session 6: Ship Telematics Roundtable

Sponsored by ClassNK
The telematics (machine-to-machine connectivity) industry is growing exponentially. The maritime sector is gaining traction with new and innovative solutions that are impacting the bottom line.

Katrin Neuhauser (CN)

SMM 2014

Next month, Hamburg, Germany hosts the largest, most influential and arguably best shipbuilding and technology exhibition in the world, SMM 2014 to be held at the Hamburg Messe und Congress from September 9-12, 2014. "Big" is the only suitable word to accurately describe this event, which is held every two years. SMM is big in every way, from the size of the exhibition complex to the size of the exhibits, to the number and more importantly the quality of attendee driven to Hamburg every other year.

Scheduled to run Tuesday through Friday, with opening hours of 9 a.m. to 6 p.m. daily, the SMM is organized by Hamburg Messe und Congress GmbH (HMC). The fair attracts more than 2,000 exhibitors and more than 50,000 visitors from around the world, and there is literally something for everyone during this week in September in Germany.

Each day of the fair will be dedicated to one particular theme. As an overarching theme, "Innovation" will be the keyword for the entire fair.

- ***September 8: SMM Ship Finance Forum on Finance Day***
- ***September 9: gmec, the global maritime environmental congress (motto: "Setting the Green Course") on Environmental Protection Day***
- ***September 10: MS&D, the international conference on maritime security and defense hamburg, on Security and Defence Day***
- ***September 11: SMM Offshore Dialogue on Offshore Day***
- ***September 12: Maritime Career Market on Recruiting Day***

Following here are a small sampling of the new products set for debut at SMM 2014.

E-MS

E-MS, e-powered marine solutions GmbH & Co., Hamburg, will present on the SMM 2014 a state-of-the-art of electrical network-topologies on board of ships and offshore-platforms. During the last years the company has developed diesel- and gas-electric power supply and propulsion solutions, with which the combustion-engines can be operated with variable speed, without having to synchronize the generators. Thus operating points of the combustion engines, which were not available so far, can now load-dependent be used with the best possible efficiency. Beyond that, the company introduces a start-stop-function for onboard generator sets, as it is used with on-road vehicles already for a long time. Considering electric power generation onboard ship, both E-MS developed solutions together lead to fuel savings up to 12%. To optimize the installations, E-MS presents a diagnosis-system of own development, with which the continuous real time monitoring of all appliances and plants takes place. Beyond diagnosis and optimization this system will in future lead to on-condition maintenance and prognoses of the behaviour of plants.

E-MS
The silent engineering®

MAN Extends High Speed Power Range

At SMM 2014 MAN will present a new 12-cylinder V-engine for workboat use, extending the power range of its high-speed marine engines for heavy-duty operation up to 735 kW (1,000 hp).

The D2862 LE441 is MAN's 735 kW (1,000 hp), 12-cylinder V-engine for heavy-duty operation. By adapting the turbocharger and the valve timing, MAN was able to raise the mean pressure and increase the power rating by 73 kW (100 hp) compared to the most powerful engines available until now: the D2862 LE431 and D2842 LE421, which are still available. The new MAN marine engine

SMM 2014 Facts & Figures

What: SMM 2014

When: September 9-12, 2014

Where: Hamburg Messe und Congress, Hamburg, Germany

Why: SMM is the leading international trade fair of the maritime industry. Every two years representatives of the maritime industry and experts from all over the world gather in Hamburg to showcase innovative developments and leading-edge technologies, and discuss the industry's prospects. It attracts a literal "Who's Who" in international shipping and shipbuilding.

Exhibitors: 2000+

Visitors: 50,000+

Exhibition Area: ca. 90,000 square metres

National pavilions: Argentina, Bulgaria, Denmark, Finland (2x), France, United Kingdom, Italy, Japan, South Korea, Canada, Croatia, The Netherlands, Norway, Austria, Russia, Sweden, Spain, Turkey, United States of America, United Arab Emirates, China (4x)

D2862 LE441, with its increased power and a dry weight of 2,270 kg, offers power density suited for heavy-duty applications such as tugboats and freighters. With a capacity of 24.24 l, a bore of 128 mm and a stroke of 157 mm, the engine can achieve a maximum torque of 4,380 Nm at 1,100 to 1,600 rpm.

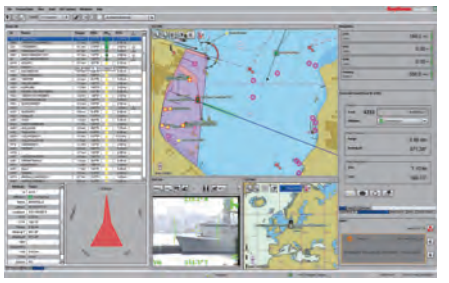
Voith DP Systems at SMM

At SMM 2014 in Hamburg, Voith plans to showcase propulsion systems and vessel concepts focusing on high efficiency and dynamic positioning. In hall A4, booth 203, a Voith Schneider Propeller as well as the Voith Inline Thruster 850, which can also be used as a bow thruster, will be on display. The Voith Linear Jet, an electric control stand, and various ship models with Voith propulsion systems round off the trade stand presentation.

The big driver for Voith at the moment is the proliferation of offshore energy structures, both in the traditional oil and gas sector as well as offshore wind power. In recent years, Voith has been equipping a growing number of platform supply and installation vessels with propulsion systems. To ensure positioning accuracy to the meter, the Voith Schneider Propellers (VSP) used as main propulsion systems are increasingly complemented by Voith Inline Thrusters (VIT) as bow thrusters on larger vessels.

With its new vessel concepts, Voith highlights the advantages of its propulsion systems regarding dynamic positioning (DP) and combines them with ideally suited designs. The “High Flow 4” offshore construction vessel presented as a model enables dynamic positioning in currents of up to 10 knots. The catamaran is powered by four VSP, boasts an open deck space of approximately 1,000 sq. m. and is designed to install tidal energy turbines in high energy tidal streams.

The Maintainer vessel concept, developed by Voith together with NavConsult, a subsidiary of the SCHRAMM group, is designed to close the gap between the catamarans that are currently used and large offshore supply vessels for the installation and maintenance of wind turbines. The Maintainer concept boasts DP2 and is designed to permit safe access to the wind turbines in a weather window up to a significant wave height of 2.5 meters. The combination of two VSP and two VIT 850-200 bow thrusters ensures precise dynamic positioning within the wind farm.



ShipGuard

In view of an increasing demand for security of merchant ships and maritime trade, Raytheon Anschütz, has developed shipborne security solution ShipGuard, which will be presented for the first time ever at SMM 2014 in Hamburg.

ShipGuard is designed to efficiently integrate a vessels existing navigation systems such as AIS and radar with a suite of commercial surveillance cameras. ShipGuard is available as a stand-alone system to upgrade existing or bridge system installations or as a functional task on Raytheon Anschütz’ Synapsis multifunctional workstations. In its basic configuration ShipGuard offers the crew early detection and identification of approaching contacts, intuitive classification and efficient alarm zone monitoring.

Fight Piracy – *Intelligently*

Technology and Experience Go Hand in Hand

By Geir Lyngheim Olsen

While global piracy is constantly changing, modern technology adapts to exploit the weaknesses in the pirates' mode of operation. Intelligence gained from such technologies enables voyage planners and navigators to steer clear of harm – but what kind of information is required? While the image of the Somalian pirate is still high in the public's mind as the number one piracy threat, the reality is not as straightforward.

Pirates have had to change their tactics in the last few years, with a geographical expansion to the oil-rich Gulf of Guinea, including the waters off Nigeria, Ivory Coast, Ghana, Benin, Togo, Cameroon and Lagos. However, pirates are not shy of extending their roaming to Angola and Congo and seizing opportunities arising from political instability in Syria, Egypt and Libya. Beyond these areas, from India and Indonesia to Peru and the Philippines, piracy is still a threat.

This geographical expansion is just one reaction to the presence of the Navy task forces around the Gulf of Aden. Another is their use of "mother ships" operating from calm and open sea areas such as in the South Atlantic. Beyond this, pirates no longer limit themselves to hostage taking and ransom demands, expanding their repertoire to stealing high-value cargo from oil or gas tankers. Offshore installations, around Nigeria for instance, have also become an attractive target, as have support vessels. Many platforms and small vessels used for crew transfer remain unprotected and can be easy prey.

Intelligence – the Premium Piracy Countermeasure

While piracy has evolved, so too have its countermeasures. In addition to armed guards and navy protection, which are still an effective deterrent, e-Navigation solutions can provide valuable information to help seafarers avoid an encounter.

This is well proven by Jeppesen's PiracyUpdate, an electronic chart overlay available for ECS and ECDIS that helps identify, understand and manage the risks associated with crime at sea. Based on intelligence from recognized and authoritative sources on global sea piracy, it is used by mariners, shipowners and operators, insurers and several national navies to reduce the likelihood of vessel attacks. As pirates rely on certain sea states to operate, weather information is an essential element of anti-piracy data.

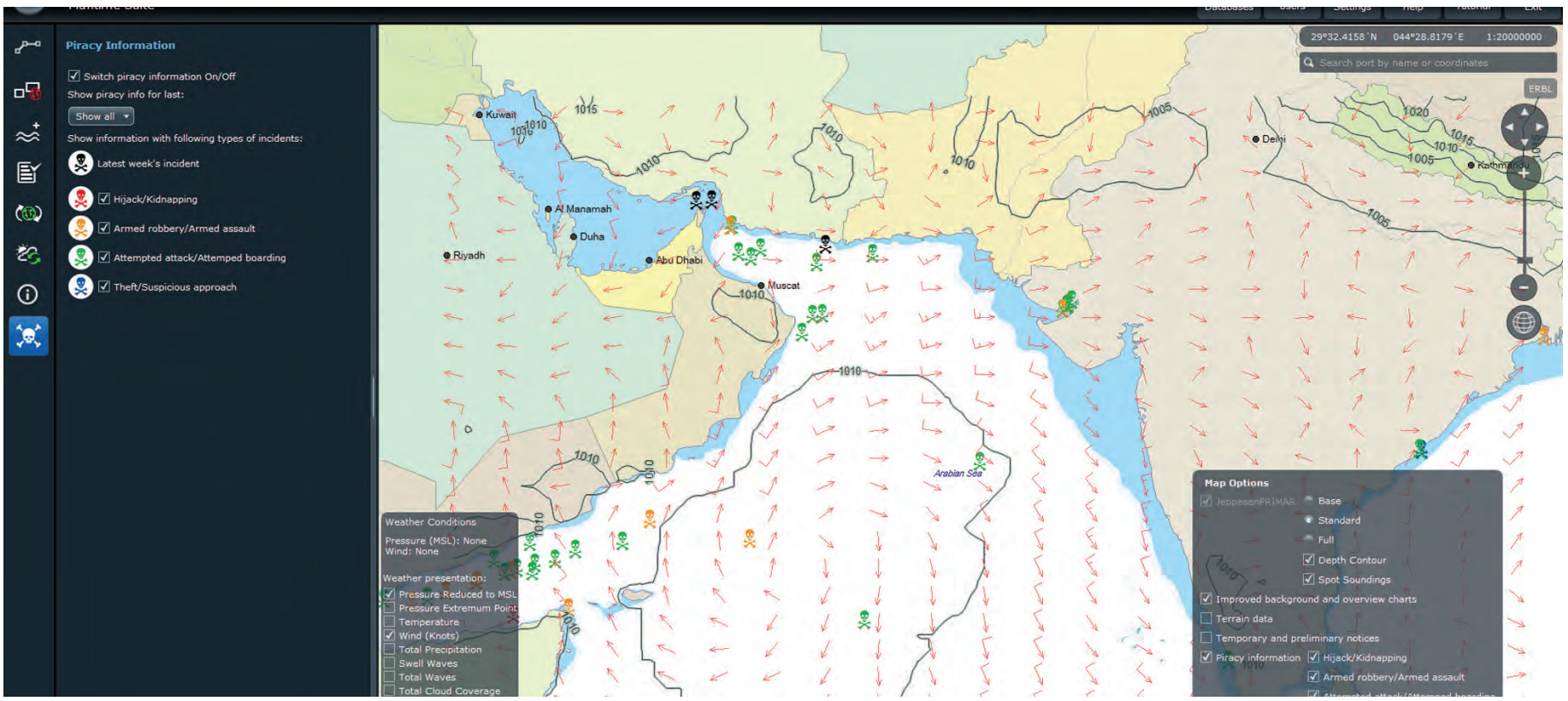
"... pirates no longer limit themselves to hostage taking and ransom demands, expanding their repertoire to stealing high-value cargo from oil or gas tankers. Offshore installations, around Nigeria for instance, have also become an attractive target, as have support vessels. Many platforms and small vessels used for crew transfer remain unprotected and can be easy prey."

Jeppesen OceanView is a marine planning software combining navigational charts, weather information and automatic route planning to create a more comprehensive picture for decision support in high risk areas.

That said, it is important to keep in mind that like with any good thing, too much data can bring along complications in the shape of information overload. Feedback from the PiracyUpdate and OceanView customers helped Jeppesen to optimize and streamline the voyage planning process within free-to-use NauticalManager software, which aggregates both weather and piracy data into a lean and user-friendly interface.

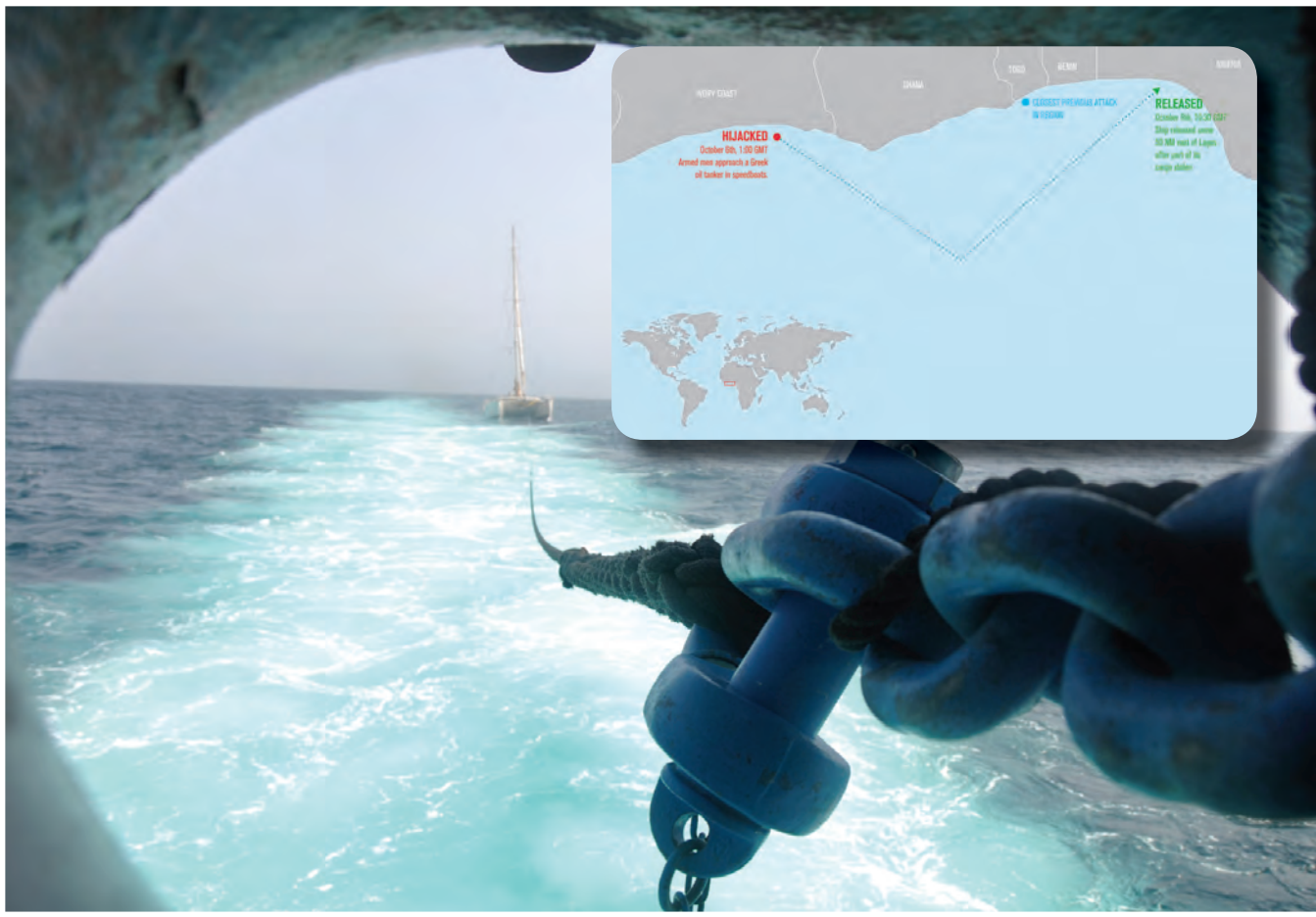
The Benefits of Advanced Intelligence Tools

As a second officer aboard an offshore PSV/tug vessel, I was charged by my captain and towmaster to do voyage planning for the tow of a jack-up rig from Amenam



field in Nigeria to Ghana. At the time, we had no electronic planning means. Except for an ECS, planning had to be done on paper charts. I had to take into account the latest intelligence report shared verbally by the towing master and look for certain weather and wave patterns. The weather forecasts came in the shape of Internet printouts. During the planning, there were sudden indications that piracy activities were extending beyond the "safe offshore distance." This meant that I had to re-plan the whole voyage, and the entire process ended up taking two days.

Today, with a tool like Jeppesen NauticalManager, ship's staff can incorporate daily piracy activity notices with up-to-date weather information. In OceanView, "alarm limits" for weather conditions (wave height, for example) can be set. This would reduce the time required to create a complete voyage plan from two days down to 20 minutes, and adapting to new circumstances would take minutes instead of hours. The integration of electronic nautical charts with information such as weather and piracy and e-Navigation software yields significant benefits for the mariner. It not only optimizes voyage safety and fuel efficiency, but also streamlines the entire voyage planning process.



OceanView and PiracyUpdate in Action

OceanView in conjunction with PiracyUpdate has widely been used to identify high-risk areas and obtain up-to-date information on the latest piracy activity. This includes keeping track of hijacked ships and the involvement of pirate mother ships. During a hijacking of a Greek oil tanker off the Ivory Coast, Jeppesen's partner Bergen Risk Solutions (BRS) used a digital anti-piracy tool to provide vital insight to lawyers, insurers, the owner, charterers and other parties involved.

In this case, a vessel carrying 14 hijackers armed with AK-47 assault rifles and knives approached the 73,400-dwt oil tanker, which was in the process of carrying out two ship-to-ship transfers off Abidjan with 30,000 tons of gas oil on board. Before the second operation took place, the vessel displayed suspicious behavior. At approximately 0100 hours local time, it switched off all lights and sailed directly south without explanation. BRS used PiracyUpdate to compare this suspected hijacking with similar incidents and was able to inform the client on what had happened, the risk to the crew, vessel and cargo, as well as on what was likely to happen next.

BRS was tasked to coordinate the logistics involved in preparing the eventual release of the hostages and the vessel. This usually includes helicopter transfer, possible medical evacuation, liaising with the protection and indemnity (P&I) insurance holder of the vessel and more. At this point, however, when and where the release would have taken place was unknown.

BRS started plotting the tanker's movement. Based on their experience and incident reports in OceanView, they soon realized the vessel was heading for a known piracy stronghold in Nigeria. This information was parsed among the parties involved in the rescue such as navies and rescue services so they could converge on the location of the hijacked tanker.

When the pirates realized their plans had been compromised, they accepted to release the hostages and the vessel in exchange for amnesty. Soon afterwards, the necessary resources could be routed to the tanker to take care of both the crew and the vessel. It was a relief for everyone that the crew left the ordeal unscathed.

Using HydroComp NavCad

To resolve static thrust problems on wind farm service vessels

HydroComp NavCad is software for resistance and propulsion that can be found in the toolbox of hundreds of naval architects and marine professionals from around the world. The latest challenge for NavCad is to help resolve a unique problem for propeller-driven wind farm service vessels (WFSVs). Much like the problems of dynamic positioning in offshore and platform support vessels, WFSVs are finding issues of insufficient thrust during static (i.e., bollard) operation. This is a solvable problem, but one which must be evaluated on a case-by-case basis.

The problem exhibited in WFSVs is one of mutually exclusive operational objectives for the propeller – efficient high speed operation versus maximum static thrust for the crew transfer maneuver. Of course, a propeller optimized for one case (high speed) will be less effective at the other (bollard).

Potential Solutions

A controllable-pitch propeller (CPP) would be the ideal solution, but since this is not generally a feasible option, we will set it aside to focus on fixed-pitch propeller (FPP) systems. For FPP propellers, maximum static thrust is determined by an equilibrium relationship between the engine's ability to generate power and a propeller's power requirement at a given RPM. There is one point on the engine's power curve where the propeller cannot be spun any faster as it would require more power than the engine is capable of producing. The thrust is generated by the propeller at this RPM, and in general, more thrust means more RPM.

The solution, therefore, is to:

a. Increase low end power for the engine so that it can spin the propeller faster,

b. reduce the propeller's power requirement (in a way that does not affect high speed operation), or

c. some combination of both.

So, a solution could come from different engine models with different power curves, or from different propeller characteristics that change the shape of its torque curve.

Propulsion Analysis

Both of these options can be evaluated by NavCad, which includes a "Towing" propulsion analysis that is built upon this equilibrium-power relationship described above. In this analysis, NavCad can find the maximum equilibrium thrust given the engine, transmission and propeller characteristics. It allows the entry (and archiving) of specific engine model power curves, so the effect of different power curves can be evaluated. It also allows for consideration of different propeller types and parameters, including their effect on cavitation breakdown. This offers the ability to look for "WFSV-friendly" propeller geometries. As mentioned above, such an analysis needs to be run on a case-by-case basis, since geometric properties like shaft angle and stern run angle needs to be considered in the analysis.

Example

The following plots illustrate how NavCad can evaluate the effect on static thrust due to differences in engine power curves and propeller characteristics. The static "bollard" condition is represented by a 0.01 knot speed, and the propeller design operating speed is 20 knots.

The plots to the left show engine loading for the given power curves of engines rated at 3,000 kW at 1,000 RPM. The plots to the right are delivered thrust overlaid onto the resistance curve. The top speed is where the two lines intersect, and the static delivered thrust is found at the nominal zero speed position.

Basis – 300 kN thrust

This is the original engine and propeller. Bollard equilibrium occurs at 520 RPM.

New Engine Model – 460 kN Thrust

This is for a new engine model of the same rating but with modestly different engine power curve, using the original propeller. While the engine is not substantially different from the original, the modest increase in low RPM power results in approximately 50% increase in static thrust with increase in RPM to 660. The top speed is shown to be maintained (intersection at 20 knots).

New Propeller – 410 kN Thrust

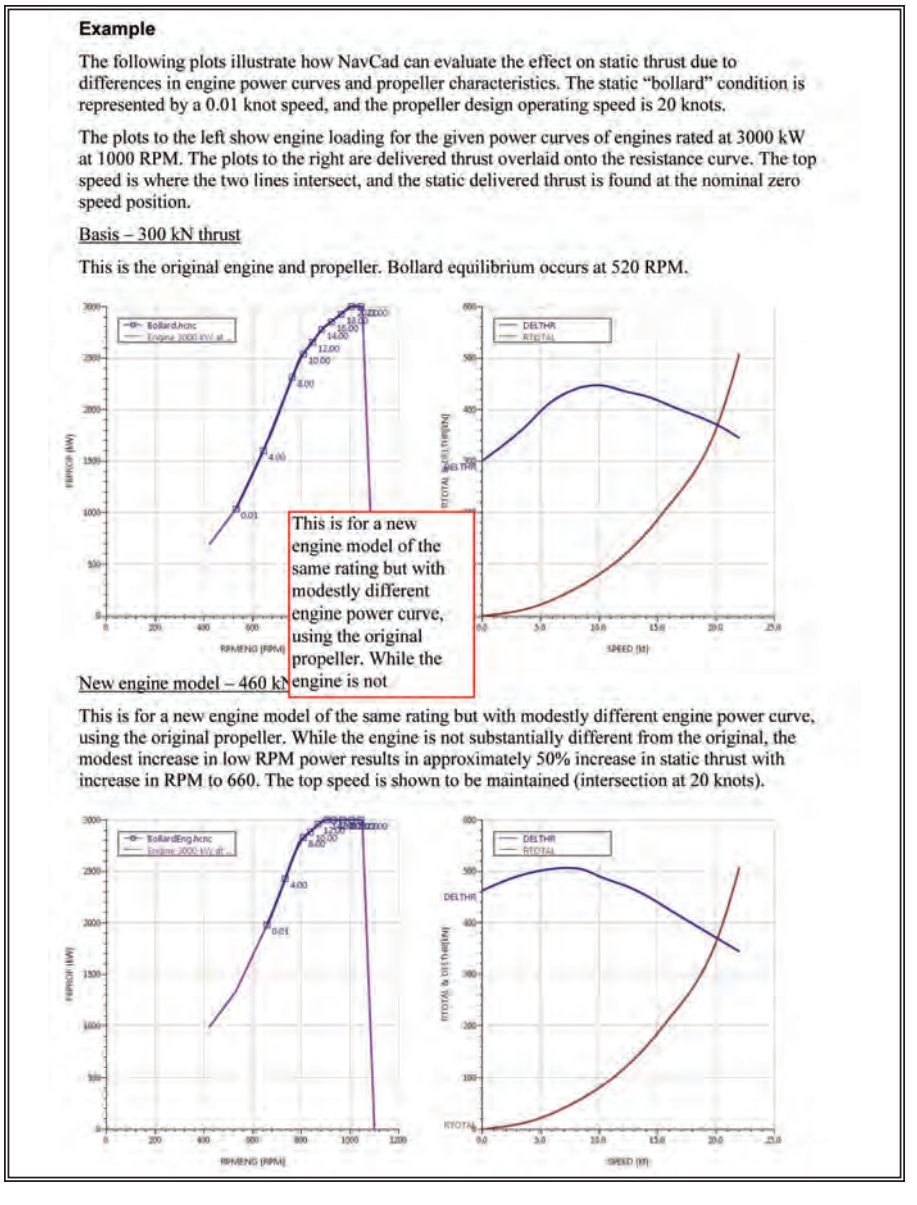
This is for the original engine with a new propeller that is designed with characteristics to reduce torque at bollard conditions. The engine is not changed, but the new propeller delivers some 35% more static thrust at 720 engine RPM. Top speed is maintained (intersection at 20 knots).

These plots illustrate how NavCad can be used to investigate the differences in engine power curves on static thrust – where an increase in the power delivery curve at low RPM will allow the propeller to spin up to a higher RPM and generate more thrust. It also shows how NavCad can assess the effect of propeller characteristics on static thrust, where for the same power requirement a different propeller might deliver more thrust. Since maintaining top speed is an important mission constraint, NavCad's robust resistance prediction capabilities are also critical to success.

As has been described herein, finding an acceptable overall solution to the problem of insufficient static thrust requires a tool that has the ability to

- correctly model the influence of engine curve shape and propeller performance on the equilibrium power "towing" condition at bollard, and
- properly predict vessel resistance to insure that top speed is not compromised by any changes that might be proposed.

www.hydrocompinc.com/software/navcad



Example

The following plots illustrate how NavCad can evaluate the effect on static thrust due to differences in engine power curves and propeller characteristics. The static "bollard" condition is represented by a 0.01 knot speed, and the propeller design operating speed is 20 knots.

The plots to the left show engine loading for the given power curves of engines rated at 3000 kW at 1000 RPM. The plots to the right are delivered thrust overlaid onto the resistance curve. The top speed is where the two lines intersect, and the static delivered thrust is found at the nominal zero speed position.

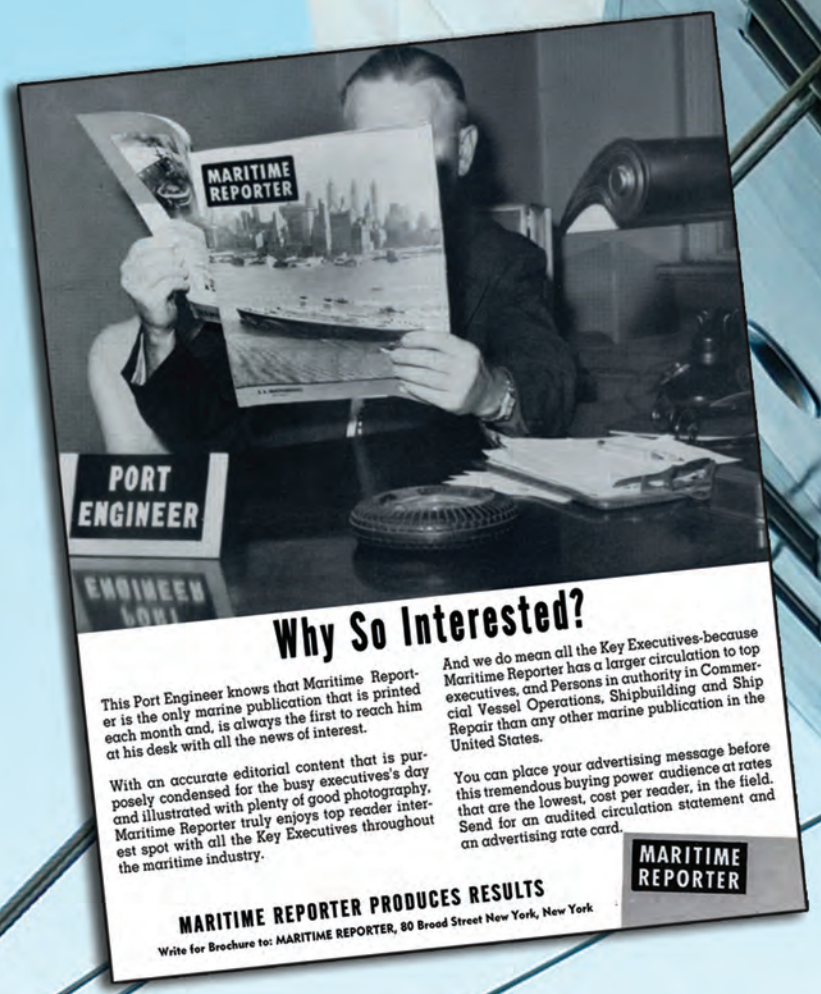
Basis – 300 kN thrust

This is the original engine and propeller. Bollard equilibrium occurs at 520 RPM.

This is for a new engine model of the same rating but with modestly different engine power curve, using the original propeller. While the engine is not

New engine model – 460 kN

This is for a new engine model of the same rating but with modestly different engine power curve, using the original propeller. While the engine is not substantially different from the original, the modest increase in low RPM power results in approximately 50% increase in static thrust with increase in RPM to 660. The top speed is shown to be maintained (intersection at 20 knots).



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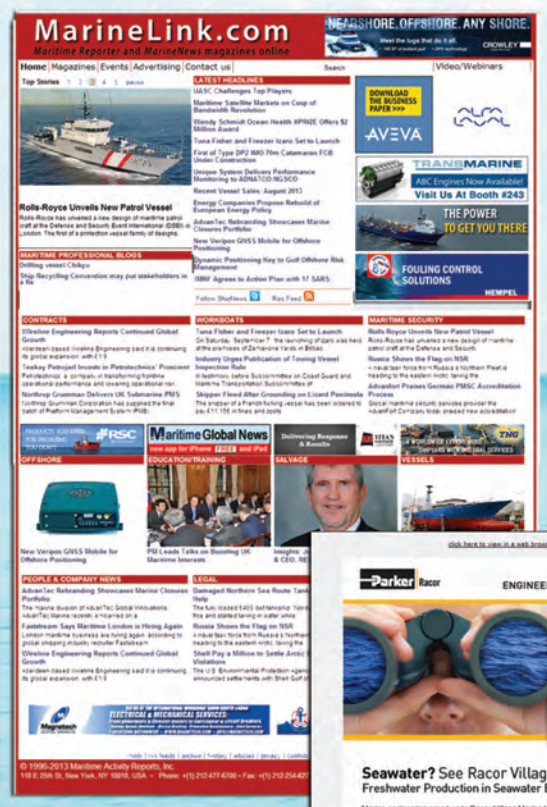


Keep it Clean & Green

by John Paparone

Biodegradable industrial cleaning products have uses in many maritime sectors.

When dealing with oil and other hazardous contaminants on vessels and in marine facilities, there are some common misconceptions about the way hydrocarbons biodegrade. "The words biodegrade and bioremediate are not interchangeable," said Jay H. Murland, CEO of EnviroLogic Biobased Technologies Inc. who manufacturer a line of over 30 EPA-approved bioremediation products.

To explain further, let's look at the difference between the processes of bioremediation, bioaugmentation and encapsulation.

• ***Bioremediation*** occurs naturally all over the earth. If you spill oil in your yard, for instance, Mother Nature activates microbes/ bacteria and nutrients present in the soil, to literally "eat" the oil/contaminate/hydrocarbon. The by-product of this eating/digestion, is water and harmless gas. The microbes, etc., grow a colony and continue to "eat" the hydrocarbon contamination until it's gone. When their food source is gone, they implode and "eat" each other. Mother Nature can take years to accomplish this task. Bioremediation products on the market today can accomplish it in days or weeks, with the same results.

• ***Bioaugmentation*** is a process where, after analysis of the contaminant, the soil at the contaminated site is "augmented" by a variety of products based on the contamination threat. These can range from nitrogen, oxygen, phosphorous, and even bacteria like that found in bioremediation products. In fact, in some instances, bioremediation products can be used as part of the bioaugmentation process to speed it up.

• ***Encapsulation*** basically "encapsulates" the hydrocarbon pollution which keeps the contaminants "locked in" until the asteroids arrive. Therefore, one of the key things to look out for when using products that can help remediate contaminants is to ensure they don't add to hydrocarbon disposal costs. Be sure that they are neutral pH and do not contain hazmat properties.

For example, for more than eight years, the Military Sealift Command (MSC) has been using NavalKleen and NavalKleen II for the removal of grease and oil from the surface of equipment, bilges and in its oil water systems, including their oily water separators with oil water content monitors. René Fry, Chemical and Fuel Programs Manager reports that oily waste has gone from a ship to shore process where the contractors would pay the ship $0.05 to $0.15 a gallon for the waste to the point where MSC would pay the same people up to $2.40 a gallon to remove the small waste stream.

"It is by far our single most popular cleaner onboard MSC's ships," he said. "Our experience with NavalKleen and NavalKleen II is that it breaks up the emulsions in the oily water mixtures so that the oily water separators can process the water out of the waste stream and minimize the amount of oil being processed ashore. He also says since using the product, the company has rarely seen its oil content monitor read anything above 5ppm, which has significantly reduced their waste oil bill from $19 million to below $7 million."

NavalKleen was also used aboard Maersk's SV Atlantic during several transatlantic voyages to remove oil residue from the vessel's 600 metric ton capacity double bottom ballast water tank after a crack was formed between it and the No. 6 heavy fuel oil tank, resulting in the water inside the ballast tank becoming heavily contaminated. After laborious mechanical cleaning and disposal of the waste water, oil residue still remained. NavalKleen II was added and lab tests were conducted during several of the voyages with significantly positive results. "This is a highly effective product for mitigating oil contamination of ballast tanks," said Jeff Phelps, Vessel Manager, Maersk Line Ltd.

The simple addition of water (salt or fresh) activates EnviroLogic's products. They are safe and easy to use and therefore require very little training of personnel. No masks and gloves are necessary as the products are non-toxic and non-caustic.

In fact, several lab tests carried out at AGES Laboratories in Pennsylvania on EnviroLogic's Spillaway Powder revealed significant reduction of petroleum hydrocarbons. Within minutes, the product began digesting the contaminants. Ninety percent of the hydrocarbon contaminant was gone in the first hour and 98 percent in the first 24 hours.

Bioremediation isn't just for the big oil spills. These products are best used in preventative daily routine maintenance on everything from decks and galley floors to hydraulic lines, machinery and more.

In a real-world test that is comparable with the hydrocarbon issue in the marine environment, EnviroLogic's Spillaway+ and FleetKleen products were combined to produce a paste-like substance that was spread over an old greasy machine that had sat outside for over six years at the back of a Delta Airlines facility. Once the bioremedial material had sat for a few minutes, water was sprayed over and the machine was left overnight.

During the night, it rained hard and in the morning Greg Cox, PSA and Environmental Coordinator for Delta, who had carried out the test with a colleague, was astonished at the result. "One of the best advantages aside from its ability to clean the deepest crevices and cracks on any surface is the added benefit of cost-savings and time," he states. "This doesn't require any heavy cleaning and you don't have to sweep or pick up the residue and have it hauled away."

Bioremediation products should be sophisticated enough to provide the exact formula targeted at the right type of contamination according to Envirologic's Murland. "EnviroLogic's Spillaway+ brand products use a refined technology that encourages growth and reproduction of contaminant-specific, non-pathogenic, naturally occurring microorganisms to enhance bioremediation," said Murland. "We certainly support the best management practice of using these products in all areas, but especially in all open systems such as bilges, semi-closed systems and closed systems."

John Paparone, Principal of Environmental Solution, Inc., sells and distributes more than 30 EPA-approved EnviroLogic Biobased Technologies Inc. products to marine and other industrial industries.
t: 919-940-0546
e: john@totalbiosolution.com

ExxonMobil Launches New Marine Fuel

ExxonMobil Marine Fuels & Lubricants launched a new marine fuel that is designed to help marine operators comply with the 0.10 percent sulfur cap set to be introduced in Emission Control Areas (ECA) beginning January 1, 2015. ExxonMobil Premium Heavy Distillate Marine ECA 50 (HDME 50) is a new category of marine fuel formulated to meet the 2015 ECA sulfur limit and to help marine engineers safely and efficiently operate their engines and boilers.

According to the company, ExxonMobil Premium HDME 50 offers performance benefits associated with both marine gas oil (MGO) and heavy fuel oil (HFO). The fuel contains a low sulfur content associated with MGO, and has the higher flashpoint and lower volatility properties typically found in HFO. These characteristics enable marine operators to comply with the upcoming sulfur cap and to reduce the risk of engine and boiler damage.

The higher viscosity of ExxonMobil Premium HDME 50 makes storage and handling the fuel on board similar to HFO. With the fuel having to be heated, the risk of thermal shock to engine components is reduced during switchovers when entering and leaving an ECA. Thermal shock can result in fuel pumps seizures and engine shutdowns.

Prior to its introduction, ExxonMobil Premium HDME 50 was tested with Wallenius Wilhelmsen Logistics, and is suitable for use in main and auxiliary engines and marine type boilers. Following field trials, the new fuel has received No Objection Letters from MAN Diesel & Turbo (MDT) for use in MAN B&W two-stroke and MAN B&W Holeby genset designs, provided MDT's specific engine type guidelines are followed.

ExxonMobil Premium HDME 50 is already in use by a range of vessel operators. It is available from Antwerp via barge delivery for vessels operating in the Amsterdam, Rotterdam and Antwerp (ARA) region. In addition, ExxonMobil continues to offer MGO at more than 40 ports worldwide.

www.exxonmobil.com/premiumhdme50

MTU Powers Southern Towing

Ironmen diesel engines selected for Southern Towing's four newbuilds and two repowers

Memphis-based Southern Towing Company selected MTU to power six inland waterway towboats. Four new and two existing vessels will be outfitted with a total of 12 Series 4000 Ironmen engines in 8- and 12-cylinder configurations. Engines from the Rolls-Royce Power Systems subsidiary MTU were selected.

Powered by twin MTU 8V 4000 engines designed to run at a constant 1,800 rpm, the first two new vessels to be put into service with MTU's Series 4000 were 100-ft. Z-drive sister towboats named the Paula Fortier and Theresa Echols. Soon to follow were two 120-ft. Z-drive towboats christened Capt. Tommy Parrish and Capt. H.R. Kirtley, both powered by twin MTU 12V 4000 M53 engines, rated to produce 1,851 bhp at 1,800 rpm. The Series 4000 engines are matched to ZF Marine Z-Drive steering systems.

Two repower projects, each using the MTU 12V 4000 M53 engine, are still on the horizon. The new engines will increase overall fuel efficiency and decrease emissions for two existing push boats. Stewart and Stevenson, MTU's regional distributor, sold the engines to Southern Towing.

www.mtu-online.com

Caterpillar Enters Tier 4

Caterpillar Marine announced the open order board of the Cat 3516C United States EPA Tier 4 propulsion, auxiliary and diesel electric propulsion (DEP) power solutions.

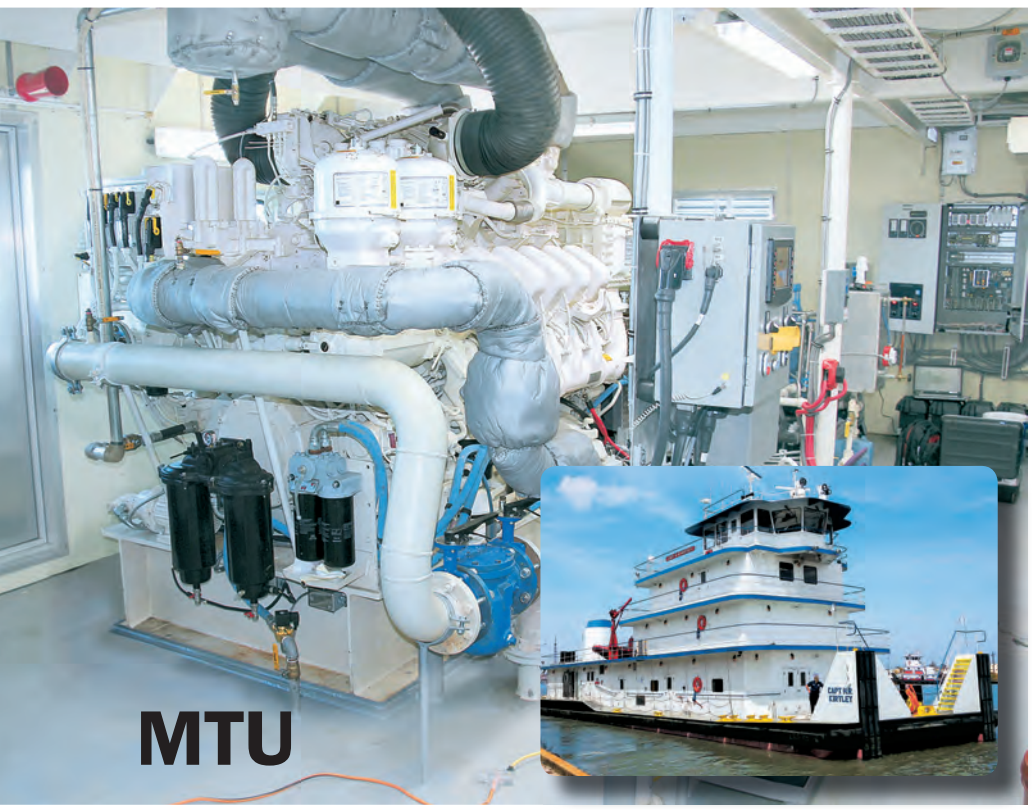
In addition to being EPA Tier 4 certified, the 3516C solutions are IMO II certified and IMO III compliant. The Cat 3516C Tier 4 certified engine is available in a 'B' rating of 2,240 bKW at 1,800 rpm and a 'C' rating of 2.350 bKW at 1,800 rpm. An auxiliary engine is available in a rating of 2,250 ekW at 1,800 rpm. Finally, the diesel electric propulsion solution is available in a 2,250 eKW rating at 1,800 rpm. Caterpillar said its Cat 3516C Tier 4 certified marine power solutions are best suited for customers in the tug and salvage and offshore industries.

Cat Tier 4 marine technology uses after treatment combined with an optimized engine to meet the low NOx regulations. Manufactured in Lafayette, Indiana, the Cat 3516C Tier 4 certified solutions employ the Cat Clean Emissions Module which incorporates selective catalyst reduction (SCR).

www.marine.cat.com

First Order for ME-GI Marine Engine

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) received the first order of electronically controlled gas injection diesel engine (ME-GI) for MES. MAN B&W 8S70ME-C8.2-GI will be installed on two 2,400 TEU + 400 vehicles ConRo ships to be built by VT Halter Marine for Crowley Maritime.



ME-GI is Diesel cycle dual fuel engine with high efficiency based on the principle of two-stroke low speed diesel engine and it can use both heavy oil and natural gas as fuel depending on relative price and availability, as well as environmental considerations.

www.mes.co.jp

Doosan Powers Meercat

The monohull vessel Jac Y Do ***launched for Conwy Harbour Authority*** measures 14 x 5 m and is powered by twin Doosan L136 six-cylinder heavy duty engines each developing 160bhp / 118kW at 2,200rpm, supplied by Water-Mota. The vessel has been built to serve several uses including general harbor maintenance, doubling as a fully operational dispersal dredger while also being suitable for secondary fire control.

Specifications for the vessel included a bow thruster, firefighting capabilities, full dredging spread with hydraulic cutter and jetting head, Iron Fist 17 t/m crane and hydraulically operated spud legs.

The eight-liter Doosan engine – marine rated to ISO 3046 – benefits from direct-injection via a mechanical governor. The engine is naturally aspirated without turbocharger or intercooling.

www.watermota.co.uk

Laborde Draws Repeat Customer

Carla Jenkins of Vidalia, La., carries on a family tradition of business on the waterways. Owner and operator of Vidalia Dock and Storage, a company started by her father in 1956, Jenkins relies on engine distributor Laborde Products to keep her fleet running.

Jenkins first became a Laborde customer last year, when she repowered her main work vessel, Vidalia Dock, with twin 1,260 hp Mitsubishi diesels. Vidalia Dock is a 93-ft., 321 GT workhorse, hauling barges full of coal and crushed limestone on the Ouachita, Atchafalaya and Red Rivers up to 300 miles from home base. Engine operation has been flawless, according to Jenkins. “Every captain who’s operated the boat has remarked on her performance and power,” she said.

“They’ve told me they’re happy to come back and pilot Vidalia Dock anytime, and that’s pretty special.”

The fact that the Mitsubishi engines are strictly mechanical is a big plus, as far as Jenkins is concerned.

Compared to the engines in her two smaller fleet boats, which are used for local harbor work, Jenkins finds Vidalia Dock’s new Mitsubishi engines efficient. “My fleet boats have only twin 640 hp engines, and run 32 gph per engine, per hour. The 1,260 hp Mitsubishis are running 45-50 gph per engine, per hour. They’re not burning a whole lot more fuel, but they provide nearly twice the horsepower.”

Vidalia Dock and Storage Company is scheduled to take delivery of another Laborde product, as Jenkins upgrades one of the fleet boats, named Sonny J after her father, with a 40 kW genset.

www.labordeproducts.com

HiCASS
Collision Avoidance Support System

Hyundai Heavy Industries Co., Ltd. (HHI) is developing the Hyundai Intelligent Collision Avoidance Support System (HiCASS), a system designed to ensure safe navigation as it searches the optimum sea routes and helps to prevent collisions by automatically detecting potential underwater obstacles within 50 km. According to the manufacturer, the accuracy of the system enables vessels to identify hazards based on the type of vessel, weather conditions, waves and wind. The system is equipped with a collision notification system that signals "Caution", "Urgent" and "Danger."

HiCASS, installed along with voyage systems such as Automatic Radar Plotting Aid (ARPA), Automatic Identification System (AIS) and Electronic Chart System (ECS), can analyze locations of the obstacles according to International Regulations for Preventing Collisions at Sea (COLREGS).

HHI completed its own performance test on the system by running it on a 13,800 TEU containership and a 162,000 cu. m. LNG carrier, respectively in May and June 2014. The system is scheduled to be commercialized in 2016.

Raytheon Anschütz

Raytheon Anschütz is launching a new generation navigation radar for this year's SMM, a radar distinguished mainly by two innovations on the transceiver: Network technology replaces analog data transmission, and a pedestal which is newly constructed electrically and mechanically reduces cost of ownership and simplifies service.

The new NautoScan NX radar transceivers are based on modern hardware and software infrastructure to achieve highest reliability on a high performance level. With the new radar transceivers network technology replaces analog data transmission through expensive and complex special cables. Radar status and raw video is generated in the transceiver, shared through a digital interface and distributed through Dual Gigabit LAN to an unlimited number of PCs without any analogue losses.

With the digital technology the new radar is designed to provide high-quality raw data and at the same time, applications on the bridge are given great flexibility in processing the radar signals – with all the diverse possibilities of modern network infrastructure. All workstations can access and use the radar video, if needed. For a workstation to become master it has to communicate with the transceiver via a secured channel that protects the radar setup from unwanted interference or changes in configuration – the former "master mode" reloaded. Correspondingly, the range of applications and requirements is wide – from a single navigation radar on a small vessel to large bridge systems, from a simple "point-to-point" connection set-up to a dual-redundant radar distribution network.

The new radar comes with a number of further improvements, such as an improved signal processing for better performance, a built-in-test for easy service diagnosis, an integrated and automated performance monitoring or an innovative "Sleep Mode" to save Magnetron lifetime when radar is on standby.

Furuno Remote Controller and Software

Furuno's addition of its Black Box system to its NavNet TZtouch family was designed to provide flexibility for captains that wanted a TZtouch system on larger displays. Soon after, Furuno introduced its new line of Multi-touch Marine Monitors that ranged in size from 17-24 inches. Customers then came back to Furuno requesting the added flexibility of viewing and controlling their TZtouch displays from a remote position. While Furuno offers its free "NavNet Remote" app for the iPad, some customers feel there is no substitute for buttons and tactile control. To accommodate their requests, Furuno introduces the all-new MCU002 Remote Control Unit.

The MCU002 Remote Controller is compatible for use with the entire NavNet TZtouch series, including the TZTBB Black Box, as well as theTZT14 and TZT9 MFD. This controller benefits installations where the displays are recessed and/or mounted a bit out of conventional reach. Furuno said the design of the controller is compact and light, allowing it to be installed anywhere, even as an "Armchair Controller", if desired.

This remote control is engineered to give users access to all NavNet TZtouch features and controls, including Chart Plotting functions, like panning, zooming and route creation. Users can also control the Radar, Fish Finder, NavPilot autopilot (when interfaced), RotoKey menu functionality and even custom page displays. The MCU002 does not replace touch control (unless you want it to), it simply enhances it. So mounted alongside a currently installed TZT14 or TZT9 TZtouch display, it will give direct, instant access to tactile controls, which can be critical in rough seas.

Biogas Ferry

L-3 Marine Systems won a contract to provide automation, navigation, communications and electrical propulsion facilities for Samsø Færgen, a new 100-m, double-ended passenger/car ferry to be built by Remontowa Shipbuilding at its Gdansk shipyard on behalf of Danish proprietor, Samsø Municipality. Initially LNG-fuelled, Samsø Færgen is expected to become the world's first ferry to operate on locally supplied biogas. Due to enter service in September 2014 on domestic routes between the renewable energy island of Samsø and Hou on the Danish mainland, the eight-deck DNV-

class vessel will carry a maximum of 600 passengers and 160 cars.

The NACOS Platinum integrated navigation system to be supplied by L-3 MSI's Lyngsø Marine division, comprises S- and X-band radars linked to a series of five Multipilot multifunction consoles and associated conning units for control of all main radar, ECDIS, automatic steering and voyage planning functions. Subsidiary sensors consist of AIS, VDR, DGPS, Doppler logs, echosounders, gyros, rudder steering and indicators, wind/weather navaids and BNWAS.

The vessel's control system is completed by L-3's MCS Platinum automated monitoring and control system, with approximately 4,000 data inputs remote controlled from several onboard computer workstations, as well as emergency shutdown and DNV-approved LNG cargo control systems.

L-3 MSI's SAM Electronics division is providing the ferry's complete electrical propulsion system. The vessel will be equipped with four 850 kW azimuth thrusters, each driven by an asynchronous motor and a speed-controlled, low-voltage PWM converter featuring the latest active front-end (AFE) technology. The vessel's power generation configuration will include the installation of two 690 V, 60 Hz propulsion switchboards, four gensets, including 1,275 kVA synchronous generators, and dual-fuel diesel/LNG engines.

Reef Pilots Endorse Smartship Simulator

To enhance its state-of-the-art combination/suite of safety and training initiatives, Australian Reef Pilots (ARP) uses the Smartship Australia facility in Brisbane to give its pilots a realistic experience on the bridge of a ship in a vast array of shipping scenarios. Smartship is a navigational and maritime center of excellence operated as an arm of the Queensland Government Department of Transport and Main Roads.

"Smartship is one of the world's most advanced maritime simulators and is the perfect training tool for our pilots who navigate in some of the world's most challenging waters; the Great Barrier Reef and Torres Strait," said Simon Meyjes, CEO, ARP. "Smartship is the perfect partner to our wide range of world's best practice systems such as the Australian start-up 'VoyageBank' initiative, a state-of-the-art innovation which tracks and plots piloted ships' movements in real time, at sea and shore side."

This navigational aid is used in conjunction with a Central Management System under which all pilots are equipped with a Portable Pilot Unit (PPU), a computer tablet which provides a 'black box' type record of every decision made by the pilot and every movement of the ship. The PPUs are touch-screen units which operate German company SevenCs Orca G2 pilotage software. This precise navigation device, uses Microsoft's cloud infrastructure, is customized by Seven Cs which has incorporated approved Electronic Chart Display Information System (ECDIS) charting to suit the unique challenges of pilotage on the Reef.

ARP headquarters in Brisbane, Queensland can track the passage of ships on a large monitor, observing the pilotage from start to finish and noting any events outside normal parameters.

VSTEP Wins Mexican Navy Simulator Contract

The Mexican Navy selected VSTEP to supply a Class A NAUTIS Full Mission Bridge (FMB) Simulator and 24 NAUTIS desktop trainer stations for the Naval Academy in Veracruz. The simulators will be installed at the new simulator training wing of the Heroica Escuela Naval Militar set to open in Q4 2014. The Heroica Escuela Naval Militar is the school where future officers are trained for the General Corps of the Mexican Navy. In line with the expansion of the school's training facilities, a new simulator wing is currently under construction. The Mexican Navy selected VSTEP as prime simulator provider for its new facility.

VSTEP and its Mexican partner Edutelsa will deliver and install a NAUTIS DNV Class A Full Mission Bridge Simulator and two classrooms of NAUTIS Desktop Trainers for a total of 24 desktop stations. The Full Mission Bridge simulators have a 240° horizontal field of view and are fully compliant with the Class A DNV Standards for Certification No. 2.14 for Maritime Simulator Systems and IMO model courses 1.22 and 1.32.

The simulators will use the NAUTIS Naval Task Force software module, which is specifically designed to meet the training requirements of navies and coast guards and includes tactical communications, amphibious landing, replenishment at sea and Anti-Piracy training. VSTEP has also developed and integrated different Mexican naval bases for implementation into the simulators.

Victaulic Vic-Press System Receives Five New Type Approvals

Victaulic received type approvals from American Bureau of Shipping (ABS), Bureau Veritas (BV), Det Norske Veritas (DNV), Korean Register and Lloyd's Register for Vic-Press, a flame-free press system for joining small-diameter stainless steel pipe. Shipbuilders can take advantage of Vic-Press as a quick, simple, safe and reliable means of joining stainless steel pipe in new-vessel construction, retrofit and repair operations. The system is approved for use in class III piping systems for marine and offshore applications.

Vic-Press creates rigid, permanent, leak-tight joints in seconds. Pipe is cut to length and deburred, marked for visual verification of full insertion, then inserted into a coupling or fitting. A handheld pressing tool is used to compress the coupling/fitting onto the pipe-end. Patent-pending press-detection technology enables the installer to identify unpressed joints as the system is filled and tested. With no flame, arc or cutting oil and little preparation time required for installation, Vic-Press is a safe, efficient alternative to welding, threading and flanging. The approved Vic-Press product range includes couplings, tees, elbows, reducers, end caps and adapters in sizes ranging from 0.5 to 2 inches (15 to 50 millimeters), with a maximum pressure rating of 232 psi (16 bar).

www.victaulic.com

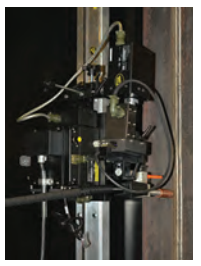
Bolidt Decking, Flooring

Bolidt Synthetic Products & Systems secured a contract as exclusive partner to Viking Ocean Cruises for the supply of decking and flooring. The contract covers Viking Star, the first vessel due for delivery in 2015 and its sister ship, Viking Sky, scheduled for delivery in 2016, as well as options on a further two vessels.

The interior design of Viking Star, from London-based SMC Design and Los Angeles-based Rottet Studios, offers a modern and contemporary feel. Bolideck Future Teak, an environmentally-friendly, slip-resistant and cost-effective alternative to traditional teak will feature in the 'Wintergarden' as well as on all outdoor decks, balconies and terraces. Bolideck Select Soft will be used for areas such as the sports deck and jogging track. This system has been specifically developed for its excellent sound attenuation qualities, combined with ease of maintenance and durability. Bolideck Select Soft provides a safe surface that is comfortable, even when barefoot.

www.bolidt.com

Bug-O Zipper Welder



While the zipper welder has been in the Bug-O repertoire for quite some time, the company said it has recently seen a larger demand for it due to increased tank production worldwide. The zippwer welder is used for vertical seam welding for storage tanks and other applications where a vertical seam weld is needed. "The zipper welder premise is quite simple. By being able to hang our rail system over the top of the tank and use only minimal magnets, it makes fit up time fast and effective," said Josh Chiprich, Bug-O Tank Fabrication Market Manager. "It is also able to roll across the top of the tank removing the trouble of picking up our system and moving the system from weld to weld cutting down setup time, thus increasing productivity and profits."

www.bugo.com

Envitia Launches MapLink Pro 8.0

Envitia released of the next generation of geospatial toolkit MapLink Pro. MapLink Pro 8.0 focuses on high performance visualization for situational awareness in both connected and disconnected worlds. MapLink Mobile for Android provides customers with the full capabilities of the MapLink Core and Terrain SDKs, enabling development of mobile applications that need to exploit geospatial capabilities such as geofencing. Central to realizing this focus are the enhancements to the WMS/WMTS client capabilities, including a seamless, persistent tile cache to preserve access to geospatial data when moving between connected and disconnected conditions.

www.envitia.com

Steering Alert System

MacGregor, part of Cargotec, launched Soteria, a new alert system designed to complement its Hatlapa and Porsgrunn range of steering gear. The system was designed to offer a series of benefits for both ship owners and shipyards. The Soteria system consists of a control cabinet with a touch-screen control panel located in the steering gear compartment, and two further touch-screen panels in the engine control room and on the bridge. If a steering problem occurs, visual and audio warnings indicate one of three classes of alert:

- Alarm, displayed in red, indicates a serious problem that needs to be resolved immediately to avoid serious damage to the steering gear.
- Warning, displayed in yellow, indicates a problem that requires attention but does not present the risk of immediate damage.
- Caution, displayed in blue, indicates that the standby pump has started. It also indicates why the pump has started.

www.macgregor.com

Vosta LMG Delivers New Dredge Ball Joints

The Crossover ball joint from Vosta LMG is a new dredge ball joint that is designed to provide optimal flow performance. Through computational fluid dynamics (CFD) the frictional losses and turbulence have been reduced. Conventional dredge ball joints act like a ball valve when tilted, causing the flow area to reduce and frictional losses to increase. The patented Crossover design incorporates two wear liners which are shaped to provide full flow area in any tilted position. Additionally the two liners provide maximum wear protection for the ball, which no longer suffers from direct wear caused by the flow.

www.vostalmg.com

Furuno Adds Color Display to NavPilot 700 Series

The NavPilot 711C provides users with a vivid, sunlight viewable, color LCD display, integrated within a compact, single-DIN Control Unit. The cosmetics of the NavPilot 711C have also been completely redesigned to match Furuno's flagship line of NavNet TZtouch MFDs. All TZtouch systems (w/v3.01 or higher software) also have the ability to control any interfaced NavPilot 700 series Autopilot, including the new NavPilot 711C.

www.furunousa.com

Page

Schensema

Schlaepfer

Wise

Hall

Miller

Tim Page has joined Seaspan Shipyards as Vice President, Government Relations. Tim will provide leadership to Seaspan Shipyards, acting as the primary representative with Government agencies and non-Government Organizations (NGO's), responsible for building and maintaining relationships with federal, provincial and local authorities, regulatory agencies and key policy makers.

Claus Schensema, GAC's previous Managing Director in Shanghai, China, has moved to Houston, Texas, to take the helm of GAC North America Logistics. Schensema brings 25 years' experience in shipping and logistics to his new role as GAC North America Logistics' Managing Director.

Henrique Schlaepfer was appointed by Inchcape Shipping Services (ISS) as its new Managing Director Brazil. Based in Rio de Janeiro, Henrique will report directly to regional Executive Vice President, Jaime Otero.

Dan Wise has joined Siemens Industry as the new Business Development Manager focused on Federal Marine Business. Dan served as an engineering duty officer in the US Navy. Prior to this new BDM role, Dan worked with Siemens One in the Government Business Office before returning to graduate school.

Brian Hall has joined Bouchard Transportation Co., Inc., the nation's largest independently-owned oceangoing petroleum barge company, as Southern Port Captain / Vetting Manager. He will report to Mike Brady, VP Health, Safety, Security and Environment and be based in Tampa, Fla.

Captain Stuart Miller rejoined Crowley Maritime's TITAN Salvage operations team as salvage master, bringing with him over 30 years of worldwide, hands-on maritime and salvage experience. Capt. Miller will be based in the U.S., but will deploy worldwide for salvage and, wreck removal ops.

Alfonso Castillero, former Director-General of the Panama Registry, has joined the Liberian Registry as Vice-President. Castillero worked for 16 years in the Panamanian maritime sector

Michael Phoon was appointed by the Singapore Shipping Association (SSA) as the new Executive Director of the SSA as a result of the forthcoming retirement of Daniel Tan after 29 years of service to the Association.

Darlene Crowder will join Foss Maritime in early August as the Vice President for Human Resources. She will be based at the company's corporate office in Seattle, Washington.

Retlif Testing Laboratories received the Cogswell Outstanding Industrial Security Achievement Award from Defense Security Service (DSS). Presented at the annual National Center for Manufacturing Sciences (NCMS) training seminar at National Harbor, Maryland, the Cogswell Award recognizes industrial security excellence and outstanding achievement in matters related exclusively to a facility's security program.

Jean-Francois Segretain, Technical Director, Marine and Offshore Division, Bureau Veritas said BV has published a comprehensive set of guidelines on LNG Bunkering, with the aim of speeding adoption of LNG as a ship's fuel by kick-starting the LNG bunker chain. BV's Guidance on LNG Bunkering NI 618 provides recommendations on LNG bunkering, focusing on the framework to be established with the port authorities and the bunkering organizations before any commercial operation, conditions to be observed before, during and after each bunkering operation, management of emergency situations and the training of staff involved in bunkering operations.

ABS has been chosen to class the world's first compressed natural gas (CNG) carrier ordered by Pelayaran Bahtera Adhiguna, a subsidiary of Indonesia's state-owned power company Perusahaan Listrik Negara (PT PLN).

Obituary: Joe LeBlanc

Joseph E. LeBlanc Jr. passed away on June 27, 2014. He was 87 years old.

Joe was president of Three Rivers Rock Quarry in Smithland, Ky. (a division of Harbert Construction), Three Rivers Towing, Harcon Barge Lines and Louisiana Limestone during the late 60s and 70s. He also worked later for Luhr Brothers at its St. Genevieve, Mo. Facility and was General Manager for Boyce Machinery in Morgan City, La. for a few years and also worked as a consultant and for NREC in Houma after he retired. Joe was an Electrical Engineer and graduated from Louisiana State University in Baton Rouge, La. He is survived by his son Trey LeBlanc (Joseph III) and his two grandchildren Jay (Joseph IV) and Michelle (Mel).

Castillero

Phoon

Retlif Receives Award

Segretain

Photo courtesy of Webb Institute

Webb Institute: Ranked #2 Best College Value

Webb Institute, an undergraduate institute specializing in Naval Architecture and Marine Engineering, ranked number two on Money magazine's list of *Money's* Best Colleges, a new approach to ranking colleges that aims to measure educational quality, affordability and career outcomes.

Corvus Energy completed a strategic investment by Green Marine Capital (GMC) previously announced on May 5, 2014. Green Marine Capital, an investment partnership of global maritime companies that draws on the maritime heritage of the BW Group and DNV GL to assist Corvus deliver its growth strategy.

Gaztransport & Technigaz (GTT), a designer of membrane containment systems for the maritime transportation and storage of Liquefied Natural Gas (LNG), won an order of nine Liquefied Natural Gas Carriers (LNGCs) which will be built by the Korean shipbuilder Daewoo Shipbuilding & Marine Engineering (DSME). Six new ships will be owned jointly by TEEKAY & CLNG and the three others will be owned jointly by MOL & CSLNG.

McDermott International, Inc. subsidiary won a contract to provide transportation and installation services to Walter Oil & Gas Corporation for the Megalodon platform destined for South Timbalier Block 311 in the Gulf of Mexico.

Scorpio Bulkers Inc. received a commitment for a $540 million loan facility and provides an update on the financing of its fleet. On July 21, 2014, the company received a commitment from two European financial institutions for a loan facility of up to $540 million. The facility will be used to finance up to 55% of the contract price of 24 vessels, including six Ultramax, nine Kamsarmax and nine Capesize vessels currently under construction for delivery in 2015 and 2016. The loan facility has a final maturity of six years from the date of signing.

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

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ANCHORS & CHAINS

Anchor Marine & Supply, INC., 6545 Lindbergh, Houston, TX , tel:(800) 233-8014, fax:(713) 644-1185, sales@anchormarinehouston.com

ATTORNEYS

Blank Rome - Admiralty & Maritime Law, 600 New Hampshire Avenue, NW, Washington, DC , USA , tel:(202) 944-3568, fax:(202) 772-5858, PBroadbent@BlankRome.com

AUTOMATIC IDENTIFICATION SYSTEM

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

BARGE FABRICATION

McDonough Marine Services, 1750 Clearview Pkwy. Suite 201, Metarie, LA 78634, USA , tel:800-227-4348, fax:(504) 780-8200, pstant@marmac.net

BATTERY CHARGERS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

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Rigidized Metals Corporation, 658 Ohio Street, Buffalo, NY , USA

BOATBUILDING AND DESIGN

Brunswick Commercial and Government Products, 420 Megan Z Avenue, Edgwater, FL 70518, USA , tel:(386) 423-2914, BCGPINFO@WHALER.COM

Tampa Yacht Manufacturing, LLC, 4350 62nd Avenue North, Pinellas Park, FL , USA , tel:813-792-2114, fax:727-954-3436, robert.stevens@tampa-yacht.com contact: Robert Stevens, www.tampa-yacht.com

BOW AND STERN THRUSTERS

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

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Hempel A/S, Lundtoftegårdsvej 91 2800 Kgs. Lyngby , tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com , www.hempel.com

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

COMMUNICATIONS

David Clark Company (Wireless Headset Communication Systems), 360 Franklin Street, Worcester, MA 77060, USA , tel:(800) 298-6235 , www.davidclarkcompany.com/marine

COMPRESSOR MANUFACTURERS

Bauer Compressors, 1328 Azalea Garden Rd., Norfolk, VA , tel:757 855-6006, sls@bauercomp.com

COMPRESSORS

Bauer Compressors, 1328 Azalea Garden Rd., Norfolk, VA , tel:757 855-6006, sls@bauercomp.com

CORDAGE

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

CORROSION CONTROL

Rustibus, 2901 West Sam Houston Pkwy, North SUITE E-325, Houston, TX 77041, USA , tel:(832) 203- 170, fax:(832) 203-7171, houston@rustibus.com

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

COUPLINGS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

CRANE - HOIST - DERRICK - WHIRLEYS

F&M MAFCO, Inc., 9149 Dry Fork Road, Harrison, OH , USA , tel:(800) 333-2151, fax:(513) 367-0363, websales@fmmafco.com contact: Jen Gardner, www.fmmafco.com

DECK MACHINERY- CARGO HANDLING EQUIPMENT

F&M MAFCO, Inc., 9149 Dry Fork Road, Harrison, OH , USA , tel:(800) 333-2151, fax:(513) 367-0363, websales@fmmafco.com

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

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

DRILLS

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

DRIVESHAFTS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

EDUCATION

Sea School (U.S. Coast Guard Approved Courses), 8440 4th Street North, St. Petersburg, FL 70002, USA , tel:(800) 237-8663, cathybancroft@seaschool.com

ELECTRIC DRIVE SYSTEMS

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

ELECTRIC MOTORS AND CONTROLS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

ELECTRICAL EQUIPMENT

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

ELECTRICAL SERVICES

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ENVIRONMENTAL SOLUTIONS

Environmental Solution, Inc., P.O. Box 788, Wake Forest, NC 99835, USA , tel:(919) 740-0546, john@totalbiosolution.com contact: John Paparone, www.totalbiosolution.com

FANS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

FASTNERS

Nord-Lock / Superbolt, Inc., 1000 Gregg St., Carnegie, PA 92138, USA , tel:(412) 279-1149, fax:(412) 279-1185, Jason.Milburn@nord-lock.com

FILTERS/FILTER SYSTEMS

UT 99 AG Oil Mist Separators, Schaubenstrasse 5 CH-8450 Andelfingen , Switzerland , tel:+41 52 397 11 99, fax:+41 52 397 11 90, info@ut99.ch , www.ut99.ch/en

FUEL ADDITIVES

Nano Fossil Fuels Technology, LLC, 550 South 16th Street, Sparks, NV 60504, USA , tel:775-356-0280, fax:775-356-0283, nanofuels@sbcglobal.net contact: Ernie Gisler, www.combustion-catalyst.com

GALLEY EQUIPMENT

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

GROUNDING & EARTHING BRUSHES

Sohre Turbomachinery, Inc., 128 Main Street, Monson, MA , USA , tel:413-267-0590, fax:413-267-0592, tsohre@sohreturbo.com contact: Tom Sohre, www.sohreturbo.com

INSURANCE SERVICES

WQIS (Water Quality Insurance Syndicate), 60 Broad Street 33rd Floor, New York, NY 18974, USA , tel:1-800-736-5750, fax:212-292-8716

INTERIORS

Rigidized Metals Corporation, 658 Ohio Street, Buffalo, NY , USA

LAUNDRY EQUIPMENT

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HANSEN PROTECTION AS, P.O. Box 218, Tykkemyr 27 1597 Moss, Norway , tel:tel: +47 6900 1300, fax:fax: +47 6900 1301, hpro@hansenprotection.no , www.hansenprotection.no

LIGHTING SYSTEMS/ EQUIPMENT

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MARINE TRANSPORTATION

Central Boat Rentals, Inc., P.O. Box 2545, Morgan City, LA , USA , tel:985-384-8200, fax:985-384-8455, earl@centralboat.com or gary@centralboat.com

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JMS Naval Architects, 34 Water Street, Mystic, CT 22203, USA , tel:(860) 536-0009 EXT 16, fax:(860) 536-9117, RickF@JMSnet.com contact: Rick Fernandes, www.jmsnet.com

OFFSHORE SERVICES

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

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Massachusetts Maritime Academy is an AA/EEO employer. Under-represented groups are encouraged to apply.

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Location: Florida (USA)

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Essential Job Functions:
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- Develop, coordinate and ensure implementation of navigational policies and procedures to include monitoring passage planning, preparing comprehensive voyage plans.
- Assist in developing and maintaining vessel specific operating procedures, dynamic positioning and cargo securing.
- Ensure that vessels are in regulatory compliance.
- Ensure organization of, oversee and approve the overall maintenance, inspection, and certification programs for the hull and marine-related equipment/machinery.
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Established 1969

Marine Quality Assurance Advisor
Job Location: USA, Houston

Job Summary
•Evaluate third party operator Safety Management Systems and vessels to determine operator eligibility for ExxonMobil affiliate business.
•Provide technical expertise in support of regional/global commercial operations

Primary Job Functions
•Evaluate vessels being considered for charter using proprietary marine quality assurance assessment protocol.
•Utilize OCIMF inspection/assessment systems to evaluate operator/vessel acceptability
•Support resolution of marine issues relating to vessel quality.
•Assess operator incident investigation findings and corrective actions.

Job Requirements
•Professional mariner, proven leader, with the ability to work independently.
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•5 years minimum sailing experience specific to inland towing operations. Pilot experience required.
•2 years minimum shore side experience with an inland operator desired, preferably in an operations or regulatory compliance role.
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•Experience developing practices and procedures.
•Familiar with Risk Assessment / Hazard ID process.

•Trained operations-related incident investigator inclusive of deep root causes and corrective / preventative actions.
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•Effective verbal and written communication skills.
•Ability to write clear, concise yet detailed technical reports.
•Ability to use personal experience and guidance framework to reach a conclusion and make defensible, risk-based recommendations.
•Eligible for U.S. employment.

Preferred Knowledge / Skills / Abilities:
•Ability to manage and integrate with others in different functions and environments (e.g. culture, language, business organizations).
•Ability to initiate, analyze and develop proposals and solutions to a wide range of shipping and marine technical and operational issues.
•Conducted cargo transfers as PIC (lightering, reverse-lightering, chemicals, black oil, pressurized gas cargoes, heated cargoes).
•Experience conducting operator safety management system reviews.
•Participated in emergency response drills or actual response situations requiring unified command structure use.
•Trained and accredited ISM Code / ISO Standard Lead Auditor.
•Trained and OCIMF accredited SIRE Category 3 inspector.
•Trained as a Risk Assessment / Hazard ID team lead, with experience in the lead role of scenario-based risk assessments.
This position is based in Houston, Texas.
All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, protected veteran status, or disability status.

All interested parties should forward resumes with contact details to: SeaRiverRecruiting@exxonmobil.com.
SeaRiver Maritime, Inc. is a wholly-owned affiliate of Exxon Mobil Corporation. SeaRiver operates a fleet of U.S. flag tankers, provides global marine chartering and a wide range of marine technical and project support services to ExxonMobil affiliates throughout the world.
Jessica Connery
SeaRiver Maritime, Inc.
Houston TX USA
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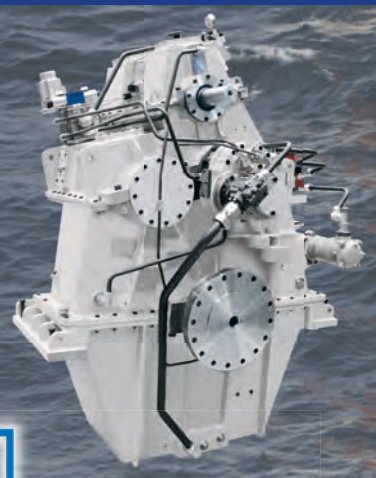

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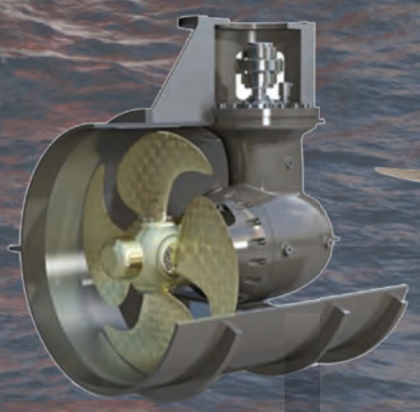

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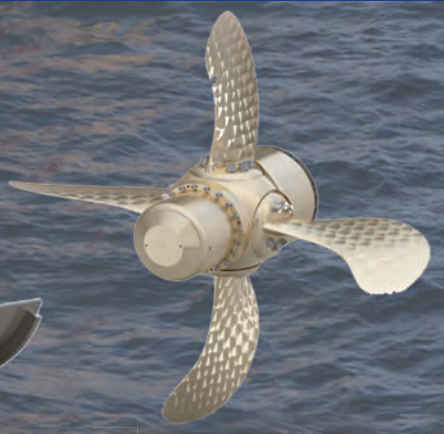

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GULF COAST
Karl Senner, LLC
25 W. Third St., Kenner, LA
(504) 469-4000

E-MAIL US
Service@karlsenner.com
Sales@karlsenner.com
Parts@karlsenner.com

WEST COAST
Karl Senner, LLC
Seattle, WA
(425) 338-3344

WWW.KARLSENNER.COM